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INTERIOR DESIGN

ARCHITECTURE

PRESERVATION AND HERITAGE

URBAN DESIGN AND PLANNING

Interior design

Responsive digital design - interactive interior architecture

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ABSTRACT
The research topic is based on the desire to align the architecture and design related responses to the current environmental, social, cultural conditions. Regarding all architectural proposals that are as complex, as they are "petrified" in time and space, we analyze the principles, according to which they should constantly auto-correct themselves depending on the exterior stimuli and the relevant occurred changes. Hence, architecture would become an interactive, live, responsive mechanism, which would meet users with the best solution, configured depending on the parameters that influence it in a particular moment in time.

Keywords: parametricism, responsivity, interactivity

I. INTRODUCTION

"In a decaying society, art, if it is truthful, must also reflect decay. And unless it wants to break faith with its social function, art must show the world as changeable. And help to change it." [1]
Next, we will analyse the principles that give birth to contemporary and interior architecture, drawing on the ideas of continuous change, flexibility, responsivity and interaction with the user. We will also outline the theories based on the constant improvement of the response given by architecture according to the versatile exterior environment; then, based on how people develop as bio-psycho-social beings in an ever changing environment, which constantly influences their reply, we will outline a possible direction of thought towards the development of interior architecture as living, interactive, real time responsive entity.

II. ARCHITECTURE AS FUNCTION, SPACE, SHAPE, FIELD – ANALISYS

Architecture, in its complexity, develops due to human activities, to needs and requirements resulted from peoples' choices. It represents "petrified" points – a space, a place, a shelter – within the infinite matrix of the human paths. However, it has been regarded less as the sum of a series of activities and as materializing itself even in this continuous and infinite spirit.
General and interior architecture are born from activity, which develops function, which then sets the tone for shape... Although these seem like the natural chronology and causality, it is exactly the complexity of this equation that has generated not only many solutions, but different interpretations, which led to possibly infinite approaches.
We firstly recall the functionalist approach of architecture through the famous phrase "Form follows Function" [2]. Taken from Greenough, for Sullivan, this was "distilled wisdom, an esthetic creed, the only <rule to which no exception will be allowed>." [3]. This concept was then adopted at the end of 19th century – beginning of the 20th century, when technology, esthetics and economy intersected violently, generating the necessity of an approach different from the past centuries. Alongside "ornament is crime" [4], this functionalist approach would decisively influence modernist architecture and, thus, great architects such as Le Corbusier, Walter Gropius, Mies van der Rohe, Gerrit Rietveld or Alvar Aalto.
Next, viewing architecture from another point of view, we notice a deviation from the patterns, in the second half of the 20th century, with the Sydney Opera, in which form and esthetic choices respond to some needs, but not to the classical individual needs as before. The concepts of landmark-buildings, brand, flagship projects, star-(ar)chitects appear throughout the years as a response to global tendencies in the context of an acerb economic competition. Thus appear emblematic projects intended to draw attention to a certain spot on the global map. They will push the technological solutions to extremes unseen before, bringing often shape to the forefront, and then resolving the functional needs within the spectacular envelope.
Finally, we recall the Rolex Learning Center designed by SANAA (Fig. 1.), the landscape-gradient, landscape-tactical architecture [5] and the tendency to deviate from the idea of activity that defines architecture. This gives birth to fluxes, paths, communication and transport networks, human activity, architecture being a node within a complex matrix or, on the contrary, being able to "extend'' in the physical urban framework or only as influence, giving up its characteristic of punctual implant in favor of an ensemble of activities, areas, spaces, places, etc.

Fig. 1. Rolex Learning Center, SANAA, 2010 http://www.archdaily.com/50235/rolex-learning-center-sanaa/ (last visit: 5.04.2015)

Last but not least, the "parametricism" introduced by Patrik Schumacher pleads for an "unifying style maintained and guided by a theoretical unifying edifice, which can integrate

several partial theories: a theory of the societal function of architecture, a theory of the self-demarcation of the discipline, a theory of the avant-garde, a theory of esthetics, a theory of media, a theory of process, etc. The theory of architecture's <autopoiesis> presents such an integrated theoretical edifice. It is nothing else but the rational reconstruction and systematization of the discipline that evolves discursively, explicitly materialized as unifying theory, open to critic and constructive elaboration". [6] Elaborating the idea of an architecture resulted from the sum of all parameters that characterize the implant, Schumacher proposes, through a fluid virtual field (Fig. 2.), which will unify all information, the constant improvement of architecture based on the relevant changes from the environment, as can be seen in the movie "Parametricism", section "Urbanism". [7]

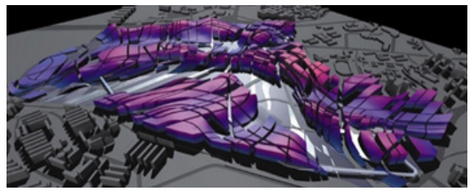

Fig. 2. One North Masterplan, Network – Fabric – Buildings, Singapore, Zaha Hadid Architects 2001-2003 http://www.patrikschumacher.com/Texts/Parametricism%20-%20A%20New%20Global%20Style%20for%20Architecture%20and%20Urban%20Design.html (last visit: 5.04.2015)

III. UNDENIABLE INTERIOR GENETIC INFORMATION OR CONSTANT CHANGE BASED ON EXTERNAL STIMULI?

The myth of the irreversible passage of time materialized through the constant changes undergone by nature, by people and things, is found in the major literary themes of most cultures; in a time where speed and efficiency govern us, we came, paradoxically, to forget that time never stops, that we are in a continuous change and transformation. How could, thus, a piece of furniture, an architectural development, an urban implant, in their "petrifaction", static and "silence" in an ever communicating environment completely satisfy their users' needs, when they are living organisms, constantly submitted to stimuli that influence and transform them?

We will underline next the human nature as a versatile, bio-psycho-social interface.

"(...) The dichotomy constructed around nature as major determinant of life's causality, through DNA, the code of codes (...) that conducts all, and around the social-scientifical perspective according to which we are social organisms (...) completely detached from biology (...), is a nonsense. However, we notice that it is practically impossible to understand how biology functions outside the context given by the surrounding environment" (Dr. Robert Sapolsky). [8] Hence, we notice certain predispositions of human behavior, which can manifest fully or not at all, depending on the exterior factors that activate them or not. Human behavior will be, thus, influenced by these exterior parameters, transforming itself through them, as well as through interior predispositions, in a matrix of infinite possibilities. And so, we reach to the conclusion that nothing is only programmed genetically (behaviors, diseases, etc.), but results from a complex equation, that contains certain predispositions, but also the sum of external, environmental, social, cultural, economical or political factors.

The genes outline certain possible directions of response, but, depending on the totality of the exterior parameters, they can be activated in different proportions or can remain fully inactive.

In direct relationship to such organisms of infinite complexity, with a cumulus of multilateral and endless natural factors, how can architecture communicate in optimum manner? [9] And even taking into account the theories concerning its interactivity and flexibility, as well as the known parametric architecture examples, which seek the materialization of these directions, how can man communicate with a liquid space, which is part of a fluid field, when the latter only imitates movement, expansion, growth, in the end still being a petrified image in a development stage, with roots in the present, petrified to the spot?...

IV. RESPONSIVE, INTERACTIVE, LIVING INTERIOR ARCHITECTURE - PROPOSAL

Taking into account all the factors of this analysis, we will project this concept on interior architecture.

It is susceptible to change according to the user's needs. The user, having control over the elements of furniture and interior ambient by the fact that their dimensions are close to the human scale, can easily materialize the transformations. More than that, there are many examples which propose versatile developments that

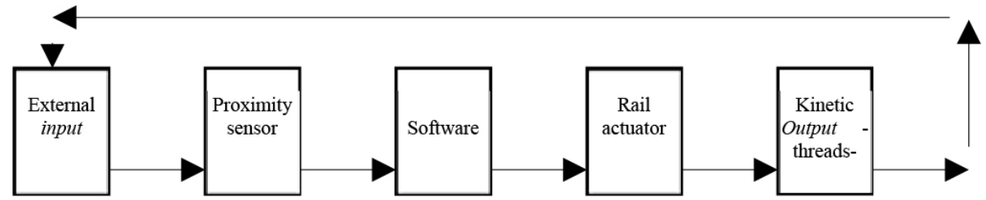

Fig. 3. Functioning diagram - Interactive wall. Concept and materialization Sinestezia.Studio (2014)

can be personalized based on the inhabitants' number and needs, changing function, configuration, place, details, textures, material, etc.

However, the purpose of this analysis is to seek for new directions of interaction between the user and furniture; the latter, after being designed and implemented, will become a self-standing piece of furniture, as well as a receptor of external stimuli, which it will perceive and transform in relevant information, processed then and materialized as self improvement, in real time. Thus, this entire communication network will constitute a multidirectional system of software-hardware constant dialogue.

Thus, to illustrate the proposed direction through some basic tests, we will describe the functions and characteristics of on ongoing experimental project, based on the general idea of this analysis. The applicative part of a theme as vast, variable, complex and profoundly conceptual as this one, which is prefigured in the speeches of the great contemporary architects, has a similarly large range of implementation possibilities. Starting from the big urban experiments of parametricism supporters and reaching to contemporary fluid, flexible and organic furniture, we propose a small scale experiment that accompanies these interactive projects in the common search of the possibly "living'' nature of architecture, interiors and pieces of furniture surrounding us.

A. Interactive Wall - Responsive to Movement

The first experiment of this type consists of an unconventional piece of furniture, intended to transform external influences into own language elements, which it prefigures on itself, in a matrix of action-reaction, stimulus-response, open to transformation in real time, according to the following diagram (Fig. 3.)

The interactive wall is made of a series of fine and repetitive vertical elements, placed rhythmically along two rails at lower and upper level. These rails allow the gliding of all verticals. Therefore, the interaction with the surrounding environment takes place through the movement filter; the ensemble's processor perceives the external stimuli through a movement sensor, transmitting them then in real time to the vertical elements network, which transforms the information in a manner of expression characteristic to its own vocabulary.

In practice, this wall of fine threads that define a complex organic area, with the two beams in the lower and upper having the shape of two special curves, retires in the immediate proximity of people, creating an airy island of vertical elements with movement along them. On the rest of its length, the wall maintains a rhythm as intense as possible, creating thus a gradient between the airy area that "reflects" in real time the presence of an individual in motion, regardless of the direction in which he is moving, and the rest of the wall, which does not perceive the dynamic, making a degradé between presence (apparition of the user) and absence (its absence along the wall) through the increasing / decreasing distance of the threads constituting the wall.

This way we have made the first experiment related to the possibility of a wall to communicate with the surrounding environment, to perceive its motor characteristics, to appropriate them and to respond in its own manner, through a permanent dialog with the user in motion. It becomes a novel communication platform between the user and the architectural panel, based only on dynamics and movement.

Fig. 4. 3D Draft – Interactive wall. Concept and materialization Sinestezia.Studio (2014)

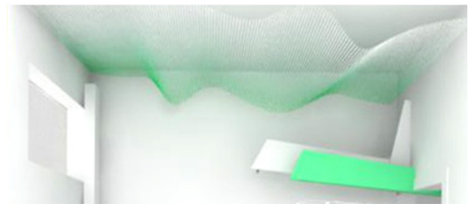

Fig. 5. 3D Draft – Interactive wall. Concept and materialization Sinestezia.Studio (2014)

B. Reflective / Responsive Wall - Mirroring the Surrounding Environment on a Dual Scale

Next, we sought to deepen the analysis of this possible trait of an interior decorative panel to interact with its users. In the next experiment we doubled the multidirectional relationship through the material we used. The responsive wall is formed this time by a large number of small mirrors that function on one hand as pixels that convey the image in front of them and, on the other hand, as a surface that reflects the environment due to the characteristic of the material itself. The functioning diagram (Fig. 6.) is, this time, a little different due to the fact that the wall does not only perceive the notion of motion in its proximity, but also receives the entire "moving" image, which it reinterprets and renders then through its constitutive elements – a matrix of small size mirrors.

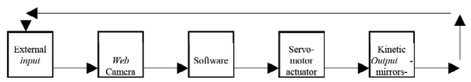

Fig. 6. Functioning diagram – Responsive wall

Concept and materialization Sinestezia.Studio (2015)The types of responses offered by it can vary according to the software, the possibilities being endless: from rendering the surrounding image to different independent animations and static positions of the mirrors, representing the desired images or certain directions (Fig. 7, 8).

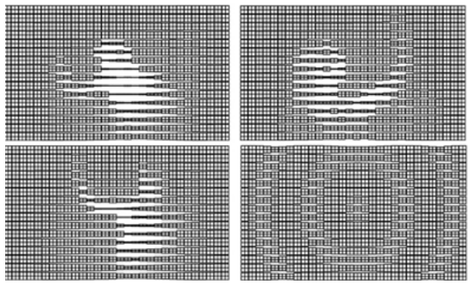

Fig. 7. 2D Draft – Reflective wall. Concept and materialization Sinestezia.Studio (2015)

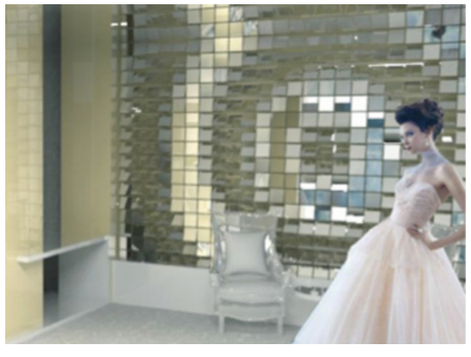

Fig. 8. 3D Draft – Reflective wall. Concept and materialization Sinestezia.Studio (2015)

This way, the second experiment presents a small scale element of interior architecture that

capitalizes the very premises of this study, managing to capture stimuli from its exterior, to reinterpret them and to transmit a response in real time, in its own formal vocabulary. Through the dual scale of the reflection, by means of both the walls' pixels' movement and the material of the pixels (mirror), the experiment of a possible communication platform between an individual and interior architecture has been thus taken to another level.

The successful result of this second experiment is underlined also by the complete materialization of the concept and the certainty of the responsive panel functioning (Fig. 9, 10).

Fig. 9. Materialization – Reflective wall. Concept and materialization Sinestezia.Studio (2015)

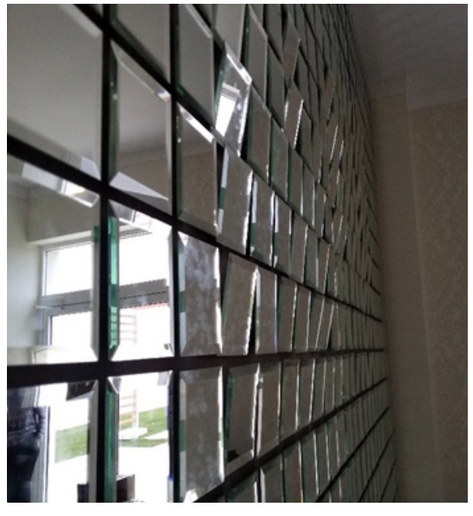

Fig. 10. Materialization – Reflective wall. Concept and materialization Sinestezia.Studio (2015)

V. SELF-DEVELPOMENT. SELF-RECONSTRUCTION.SELF-REINTERPRETATION

Taking the concept of continuous reiteration of architecture based on external relevant stimuli, which would start as being a basic static space – the shelter –and would become a constantly evolving information system – the field / the matrix – we could accept the idea that this entity observes the changes of the surrounding environment; we could also accept the idea of storing selected information; we could accept that this entity would examine all relevant stimuli; however, how could we imagine it to be capable of transforming the analyzed information into a real model as a response to this ever changing infinitely complex equasion?

A. Software versus Hardware

Contemporary state-of-the-art technology and the constant innovation allow nowadays the production of unprecedented structures of great complexity, developed through the capabilities of algorithm-based software. However, from the point of view of the present analysis, they still have a lack of substance: the chronology of their nativity.

The stages of this type of architecture's creation, independent of its fluidity, start from an initial virtual model, that takes all relevant factors into consideration, thus molding the final solution. Then, this virtual project, which actually imitates the real conditions with varying grades of accuracy, is being materialized in an existing environment. The direction of this evolution can thus be sketched through a one-way type of relationship: software – hardware, virtual programming – real representation, creation – materialization. However, in the context of the present analysis, this relation should evolve into an interdependent constant dialogue, where the virtual proposal becomes construction, which perceives all relevant external stimuli, transmitting them to the central software that processes the information and proposes an improved version of the existing model; this complex entity should then be able to materialize the proposal and transform it into reality every time opportune stimuli come to influence it. Thus,

a functional relationship of reciprocity is born between the virtual and the existent, where the virtual is being materialized and the material is being transformed into virtual information, constantly rematerializing itself on the basis of the equations it develops. Therefore, the project chronology grows from being a unidirectional temporal vector into a communication matrix of temporal and spatial impulses in continuous multidirectional movement.
In conclusion, the "form being communication that frames and the function being the actual framed communication" [10], the basis for the answer for this great unifying and infinitely versatile project would have to be defined by the design of its infrastructure – the communication networks between the virtual model and its real representation. [11]

B. RepRap Functioning Concept

RepRap, although from a related field, represents the above mentioned concept, but most of all, the complex idea of its implementation. It is "humanity's first general-purpose self-replicating manufacturing machine". [12] It if therefore, an entity that can 3D-print plastic elements; but because it is made out of these types of elements itself, it can continuously replicate itself, constantly multiplying the initial information (Fig. 10).

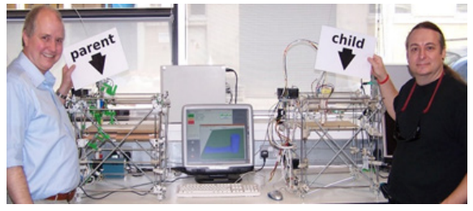

Fig. 11. First RepRap Replication (2009) http://en.wikipedia.org/wiki/RepRap_Project#/media/File:First_replication.jpg (last visit: 5.04.2015)

To sum up, the possibility of self-construction already exists in related domains at substantially lower scales than those of architecture and urbanism, having infinite possibilities of further development.
However, an open question still remains regarding the potential real-time transformation of a building as a result of all significant exterior stimuli that should cause major changes in this possibly never-ending process of rethinking and reconstruction of the structure itself.
Nevertheless, the concept of self-reinterpretation and self-development derived from the RepRap project can still open doors to further analysis regarding this subject matter. [13]

VI. CONCLUSION

Taking the present analysis and its proposals into consideration, the drawn conclusion would be that the method of perceiving information in architecture and of expressing the proposal resulted from its processing, through a unique artistic vocabulary, deserves to be aligned to contemporary technological progress; but this endeavor should not only be made through chronology and regular causality, but through a virtual unifying system, which includes all the parameters and can suggest solutions for the equations resulted from their analysis in real time, too.
From here to an interactive, responsive, living architecture, with a "self-healing" capacity and possibility of self-reinterpretation to the good of its inhabitants, of the environment and of used resources, lays an open, difficult and unknown experimental path. But interior architecture, through accessibility and its small scale, could successfully capitalize empiric interpretations of this concept. And they could form the basis for future personal studies in the field of the present analysis: namely architectural flexibility, interactivity and responsivity, all of which are features that emphasize the possible dialogue that could be created between architecture and its users.

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Libraries in conforming and nonconforming places

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ABSTRACT
Libraries remained preeminently public spaces. The internet's proliferation and the interference of the virtual space into the real public one led to the Mediatheques' birth, as an alternative to traditional libraries. A counteraction consists of library arrangements in nonconforming places, attractive by the uniqueness of their ambient, but these still address to a niche sector. A dual library, equipped both with printed book stands and multimedia support, attractive and interactive, arranged in a nonconforming place, having a well-established theme can become an attractor in the public space through its enlarged addressability.

Keywords: library, mediatheque, interactivity, attractor, public space

I. INTRODUCTION - THE EMERGENCE AND DEVELOPMENT OF THE LIBRARIES

"Libraries appeared to satisfy a fundamental need of the society: to maintain and share to the future generations the knowledge acquired along the time, recorded on a sustainable media" [1]. The first written records date back in 3000 before Christ. These contained commercial archives, hence the first libraries were aimed at accounting written records, but there were also collections of anthems, poetry, mathematic texts and others aside these. Such libraries were located in the Mesopotamia temples. The Egyptian libraries appeared around 2400 before Christ, also found in temples, having the function of religious and cultural centre. In Egypt, important crowned individuals were holding collections of important books.

The term of [2] library appears for the first time in the civilisation history at the beginning of 2000 BC. The first inscriptions were made on [3] papyrus and the writing tool was a brush made of cane with a sharp top. Aside papyrus, inscriptions were also made on clay plates or on [4] parchment. Inscriptions on clay plates dating back in 2600 BC were discovered in the Sumer temple.

The first library in the true meaning of the word appears in the 17th century in Ninive BC and it aims at educating future generations. It made available a series of books about culture and various information about Mesopotamia.

In the Roman Empire, everything changes, the library is no longer a tool of educating the population, but it becomes a private one, a sort of pride of the social standing. The importance of education is once again put on the first place in Byzantium and Islam. In 353, am imperial and a university library are built in Constantinople.

"In Europe, after the fall of the Western Roman Empire, the political and social chaos and the economic decline also impact the libraries. The western institution, which succeeds to further ensure the necessary conditions for their existence, is the Christian monastery, which sets out its foundation between 500 and 550. The monastery libraries were having three roles: to make available a place for spiritual reflection, to archive religious texts and to copy religious texts or sometimes even secular texts" [5]

II. THE HISTORY OF LIBRARIES

A. The classical period

The Alexandria library is considered one of the greatest libraries of the ancient world. It was developed and it operated during the dynasty of Ptolomeu in the 3rd century BC. Another large library was built in the honour of Tiberiu Julius Celsus Palamaenus with the purpose of storing over 1200 scrolls. Following an earthquake, the library was destroyed and currently we can only see the remains of the construction.

B. The late Antiquity

In Antiquity and then in the Middle Ages, as opposed to the classical period, several types of libraries were emerging:

- imperial libraries
- patriarchal libraries
- monarchical libraries
- private libraries

Once with the emergence of the monarchical libraries, part of the classic Greek works was destroyed and only the ones with a religious look were maintained. The monks were the ones writing the books meant for monk education. A high number of books were written, filling all the libraries from churches and monasteries.

The imperial libraries hosted many books, they also included volumes written by famous classic authors such as Plato, Aristotle and several others. These libraries developed and introduced a sort of school for education of the locals, organised around the library. In the 5th century, the Constantinople Library was becoming the largest library from Europe, with storage of over 120,000 volumes, but it did not last long because it burnt following a fire.

The patriarchal library was serving more as a warehouse for ecumenical councils. The private library is usually managed by church representatives or by aristocracy.

C. The Islamic countries

In the 8th century, the Muslims have begun importing the paper manufacturing method from China and open a factory in Bagdad. Once with the emergence of paper, the Muslims started to write more and more and to open libraries even in the smallest Islamic towns. [6] "Islam is also a monotheistic religion, it is also the belief in a single God, and aside the Koran, which is

the fundamental book, it also acknowledges the Psalms, Torah and the Gospel. The golden age of Islam, also referred to as the Islamic Renaissance, took place between the 7th and the 8th and in the 13th century AD until the 16th century and it overlaps precisely upon the European Middle Ages. Starting with the importance given to knowledge in the Islamic religion, an idea inspired by the prophet Mohamed himself, the representatives of this culture, aside the fact that they generated a lot of scientific, technological and artistic innovations, have "filed away" a great part of the ancient knowledge in all the fields, playing an essential role in their perpetuation in time, feeding in their thirst for knowledge from the streams of the Persian, Mesopotamian, Egyptian, Indian, Chinese, Greek, Roman or Byzantine civilizations. The reconsidering of the cultural ancient values took place in the Western European culture hardly in the 15th - 16th centuries, in the Islamic world the phenomenon was already at its peak; a great part of these values was kept precisely due to Islam and the enlightened personalities of the European Renaissance reached them partially in this way. By writing the knowledge and by the cultural mix, the achievements of Islam influenced the evolution of the civilization on all the continents."

D. The Renaissance

In the 15th century, a sort of "academy of scientists" is formed in the Malestian library, founded by Malatesta Novelo. Scientists and church people had various collections of books they wanted to share to the public avid for knowledge. (Fig.1,2.) The Laurentian library from Florence holds over 11,000 manuscripts and 4,500 printed books. It was built inside the Medicean Basilica di San Lorenzo di Firenze monastery under the patronage of Clement the 7th. The Laurentian library (based on the name of Lorenzo de Medici) was famous for its architecture planned and built by Michelangelo. The corridor was built over the former monachal chambers, having an entry from the upper level of the monastery. There is a stair that leads to the lecture room and it occupies half of the corridor floor. Because the lecture room was arranged in an already existing room, Michelangelo had to lower the weight of the walls, the system of frames columns it used, lowering the volume and weight of the arcades in between.

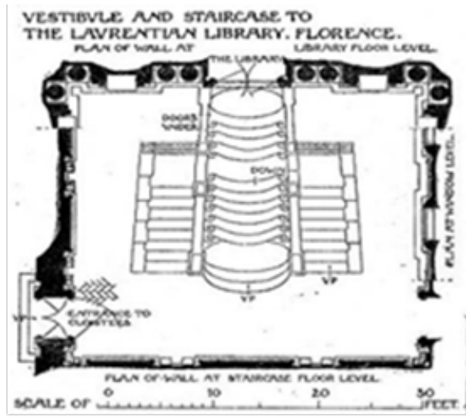

Fig. 1 The layout of the Laurentian library stair Source:http://www.vitruvius.com.br/revistas/read/arquitextos/12.133/3916

Fig. 2 The Laurentian Library lecture room

E. The Enlightenment Age

The 17th and 18th centuries were the golden age of libraries. The Chetham Library from Manchester is the world's oldest public library opened in 1653 with books in English. Another library of fairly large sizes and known for the impressive number of volumes, over 5,000, is the British Museum library founded in 1751. In the 18th century, the books become public and they are changed from parochial to borrow libraries.

F. National libraries

The first national library was founded in 1753,

meant for the public with the aim of having access to more knowledge. This library within the British Museum had a room dedicated to reading, which was opened in 1957. Subsequently, a library regulation to aid the future libraries was written.

G. The libraries of the 20th century

The libraries started to give a very high interest on the outer look, as there were built a lot of libraries in various architectural styles with modernist influences. Accent was put on the internal surface of the premises, on the way that the shelves were divided, the reading areas etc. The lighting was among the most important elements in such a space meant for reading. (Fig.3.) An example of library where a focus is put on the most appropriate use of space is the Municipal Library from Wolfsburg, built by the architect Alvar Alto in 1958-1962.

Fig.3 Arh Alvar Alto, Wolfsburg Municipal Library, Germany 1958-1962 Source:https://www.pinterest.com/pin/565131453211550725/

III. TYPES OF LIBRARIES

Depending on the activity field, libraries are divided in:

· classical libraries, focused on collections of text and graphics

· mediatheques: multimedia libraries, electronic libraries

A. Classical libraries, focused on collections of text and graphics

These libraries are usually the traditional state ones, university libraries, school libraries etc. Generally, university or school libraries are connected to an educational unit with the aim of helping the student in finding the school curriculum and to "push" them towards a research, closer-knowledge stage on several interesting things. Harvard is among the greatest university libraries in the world. In 1990, the Congress Library became the world's largest library, containing universal collections in over 450 languages. The National Library of Romania was opened in 2012 and it is included in the top best libraries in the world, surpassing the public library from New York.

B. Mediatheques - multimedia libraries/ electronic libraries

The emergence and proliferation of Internet led to the appearance of mediatheques, as an alternative to the traditional, physical-media library. The mediatheques contained originally a rich background of albums, musical parts, books and art magazines, audio and video tapes and subsequently CDs and DVDs. In some of these places, art exhibitions or seminars could be organised.

The electronic libraries provide books, newspapers, magazines, video content (movies, documentaries), audio records (music, audio books) - all in electronic form, mediated in digital interfaces addressing the two involved senses: seeing and hearing. These are of two types: the library of a computer program or collections of electronic data interconnected by means of computer networks (Internet).

The contemporary libraries can be exclusively electronic or can be developed in "electronic sectors" of some traditional libraries that also contain printed book sections. Some of them are institutions, other are constituted in integrant parts of some university institutions, museums etc.

(Fig.4,5,6.) The "Ars Electronica" Center from Linz, Austria, is not a mediatheque in itself, but a visual arts centre with a multidisciplinary, interactive and educational character. Although the new artistic environments assume the clearance of the museum criterion - idea taken since the historical avant-garde - the suppression of the material media by digital technique leading to a full opening, the removal of the museums is nevertheless an illusion provided that the Internet already develops its own museum, its own

galleries (websites, platforms or networks). The contact of the receiver with the work of art remains a remote one, intermediated by the PC display.

Fig. 4. Ars Eelectronica Center, Linz Photo: A. Racolța

The "Ars Electronica" Center plays somehow paradoxically precisely the role of museum of electronic art, or better said of exhibition space or manifestation media provided that it facilitates the direct contact with an ephemeral product, be it real or virtual, resulted following an act of creation sustained by computer use. Moreover, "Ars Electronica" is at the same time the place where a number of specific projects are released, provided that it has an interdisciplinarity with a multitude of scientific areas. The public is at its turn encouraged to interact with the "Exhibits" from the museum in a ludic process meant for all ages. The collaboration between artists and scientists in approaching some complex themes (climate change, population increase, environmental pollution etc.) is completed by the direct intervention of the visitors.

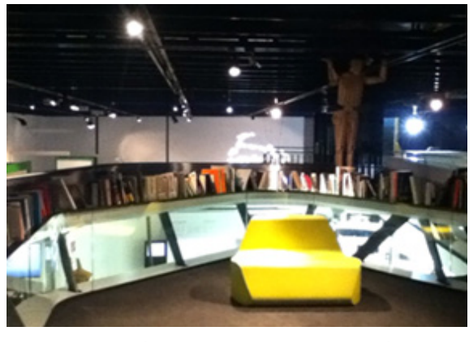

Fig. 5. Ars Eelectronica Center, Linz Photo: A. Racolța

Fig. 6. Ars Eelectronica Center, Linz Photo: A. Racolța

IV. REUSING DECOMMISSIONED PLACES AS LIBRARIES

A "resistance" counter-reaction in successfully increasing the virtual media is the development of libraries in noncoforming spaces, attractive due to ambience, but these address to a niche sector, many of us preferring today a digital library, online or individual study at home, on the Internet.

The spatial features and the old functionality of such buildings often refrain powerfully on the new utility, particularly when the new library becomes a thematic one, either by the provided study material or by the internal or external "scenography" that often defines its title. Specific examples are various and plenty:

A. Bookstore Dominican church Maastricht

Architects: Merkx and Girod
Surface: 1200 sqm
Year: 2007

(Fig.7,8.) This example is completely different from the form in which we usually see a library or a book store. The desacralisation of a church is a dubitable process in terms of morality, which can bring the odium of the religious community, but in this case the new designation is not a frivolous one (such as a record library, as for example, in other cases). It is about a development that somewhat reminds about the past image because at the beginning, some of the libraries were also found inside monasteries, churches, temples. The architects Merkx and Girod received a project assuming the development of a library in a nonconforming space - a Dominical church/ This is a religious edifice built in the 13th century, in a Gothic style. The same architects designed two other libraries for the same client, but this time something special was intended.

Fig. 7. Bookstore în Dominican Church Sursa: http://www.dezeen.com/2007/12/04/a-shop-in-a-church-by-merkx-girod-architecten/

Fig .8. Bookstore în Dominican Church Source: http://www.dezeen.com/2007/12/04/a-shop-in-a-church-by-merkx-girod-architecten/

Although originally the customer's intent was to divide the chosen area on two levels, this intention was not appreciated by the architects because they wanted to maintain and value the beauty of the church. To satisfy both sides, the area was divided in two, one part compartmented on two levels and the other left free. The altar was transferred in a coffee shop with a cross-shaped central table. The compartmenting of the library itself was made by means of a black steel structure that did not affect the building strength structure. In 2008, this development received the title of the most beautiful library in the world, given by The Guardian. To highlight the beauty of the church, restoration works were executed and a minimalistic furniture was proposed to clear the premises. The indoor lighting is one of the most important aspects of the development because it was intended to have a lighting to remind of the light given by candles that once used to burn in the church.

B. Lyuan library

Architects: Li Xiaodong
Location: Beijing, China
Year: March 2011 - October 2011
Surface: 175 sqm

It was intended to create a space were the locals would feel comfortable and as close to the nature. [7] The construction is executed in a proportion of 90% from local materials found around the site. The outer walls are made of glass panels covered with wooden "canes" found at the locals, with the aim of preventing the light from penetrating directly inside, positioned on a steel frame. (Fig.9.)

Fig 9. Arh Li Xiaodong, Liyuan Library, 2011 Source: http://www.archdaily.com/256525/li-yuan-library-li-xiaodong-atelier/

Aside this aspect, the "construction case" falls good in the landscape. The interior is divided on several levels and each space is used to store

books, such as the surface from between the levels. Each level has several functions, the stairs are used as a seating area and for book storage, the windows are divided in several beams, forming selves for books. A large part of the books from this library is donated by people or organisations. The materials, the colour range, as also the construction techniques, all of them are designed to fall within this small construction in nature. The simplicity of the parallelepiped structure somehow replicates the rural constructions from China, made from materials provided by nature, waiving the appearance of architectural design. The Liyuan Library represents a major discrepancy as against what currently happens in China.

C. Book mountain library

Architects: MVRDV

Location: Spijkenisse, The Netherlands

It is a library similar on the outside with the classic Dutch farms. (Fig.10,11.) The construction has the shape of a pyramid with brick walls and the roof is made of glass on wood structure. The name of the library comes from the spiral made of book selves, routes and terraces that come around the central space on a length of 480 m on a height developed on the 5 shelf levels going upwards to the central coffee shop positioned towards the pyramid top.

Fig 10. Arh MVRDV, Book mountain Spijkenisse, The Netherlands Source.:http://www.dezeen.com/2012/10/04/book-mountain-library-pyramid-by-mvrdv/

Because the natural light penetrates directly into the room, there is the risk for the books to degrade in time. The library also contains an auditorium, an education centre, rooms, offices, stores and a chess club. The shelves are made from recycled fireproof flower pots.

Fig 11. Arh MVRDV, Book mountain Spijkenisse, The Netherlands Source.:http://www.dezeen.com/2012/10/04/book-mountain-library-pyramid-by-mvrdv/

D. Library bus

Architect: Peter Thuvander, Martin Hedensrom

Location: Kiruna, Sweden

(Fig.12,13.) A new innovating location for a library was designed and built by some architects in a bus. This library fulfils several functions such as library and a small cinema. The bus shape is designed to include a maximum of services. The front part of the bus is organised as a traditional library with several shelves and a chair.

Fig 12. Library Bus, Kiruna, Sweden, Source: http://www.shearyadi.com/myworld/library-bus-of-the-year-by-the-swedish-librarian-society/

The back part is more for a young public and it includes other media, such as music, movie and computer games. Aside this, there is a couch to listen to music. The back part of the bus can be used for

classes and movie projections. The bus function is not only a book transportation means, but also a culture recipient and a meeting place. During the night, the bus becomes a lamp to attract the people around. The shelf frames are made of aluminium and are covered with white paint. The chairs are made of MDF. The floor is made of circular grey rubber.

Fig 13. Library Bus, Kiruna, Sweden, Source: http://www.shearyadi.com/myworld/library-bus-of-the-year-by-the-swedish-librarian-society

V. CONCLUSIONS - ARGUMENT FOR THE POTENTIAL OF CONTEMPORARY LIBRARY DEVELOPMENT IN NONCONFORMING SPACES TO RECOVER THE PUBLIC SPACE

A dual library, equipped both with printed book sections and with multimedia information based on most recent technology, attractive and interactive, developed in a nonconforming place and with a well-established theme operating as a “hook”, as an attractor, could be a successful solution, addressing simultaneously several typologies of culture consumers and several categories of age. Such a library would be successful if the material provided here free of charge can only be found on internet if purchased. A potential multifunctional character, permanent or temporary (the literary coffee shop, small theatre, small concerts or events, book releases, lectures, projections etc.) can be an additional point for the operation of such a library. Such places can also help the parents with premises developed for children (kids area) to provide a diversity of specific activities yet “masked”, focusing towards the educational side based on the ludic, attractive and interactive character of the learning “interface”.

The optics based on community acknowledgment of a value of a decommissioned edifice (historical, aesthetical, economic or just sentimental value) can transform a building that from various reasons became non cost-effective for a certain functionality, in an attractor, by recovering and re-operating it as a public endowment (multimedia library), yet maintaining the thematic of the old function to facilitate acceptance from the local community that it involved. By its new function, a plus of value can be given into the local community public space. The overall local community can even be reinforced by the accession of several categories of age to the same cultural objective based on the existing thematic of the edifice, also outsourced in the circumstantial space. The mix between the various sub-cultures can be achieved by arranging such a cultural pole with extended targeting, because the inflow of culture consumers from outside the respective adjacency can be important; by a reverse process, the thematic value of the place can increase on urban level by inserting it into the awareness of the new “customers” coming from other areas of the town or even from other cultural environments.

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[2] the Greek biblos = book and theke = chest

[3] PAPYRUS, papyruses, n.s. Aquatic herbaceous plant with stems made of membranous sheeting, which grows mostly in the Nile Delta and in Central Africa (Cyperus papyrus)

[4] Parchment, scrolls, n.s. Skin (sheep, calf etc.) processed especially to write on it, used in the past instead of paper. (http://dexonline.ro/)

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Architecture

Environmental reintegration and refunctionalisation of disused buildings. Indoor-outdoor harmonization and technical solutions of energy efficiency

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ABSTRACT
Structures with no historic value, disused due to the social and economic dynamics lien the surrounding site in terms of architectural aesthetics, ecology and socioeconomics. Their recovery and refunctionalisation aims the increasing quality of the related area by means of environmental design which articulates the architectural field with the ecological and economical ones, targeting a positive impact to the adjacent communities' quality of life. The architectural project must be preceded by a multidisciplinary research, whose non-architectural conclusions will be reflected by specific projectual gestures.

Keywords: recovery, refunctionalisation, energy streamlining, disused buildings, ecology

I. INTRODUCTION

The post-industrial age - on global scale - and the post-totalitarian-communist age - with reference to the area where they manifested - have generated a landscape often populated by the ruins of what the engineering evolution and the new quality demands made to result as ineffective and inappropriate in functional terms within the new temporal context. The environmental reintegration and refuctionalisation of the disused buildings, both in architectural terms and with respect to the new economic and eco-energy realities, forms an act of settlement for the issues generated by the multitude of abandoned structures, which act in an environmental context both in aesthetic-architectural and social and economic forms.

II. THE FAITH OF THE DISUSED STRUCTURES - BETWEEN DEMOLITION AND RECOVERY

In the 20th century, the expansion of the cities was made with a dynamism that often surpassed the natural acceptability limits of the economic and social systems, generating residual items materialised in disused structures. The unequal pace of development of the various components of the current and modern systems induces distortions and unexpected juxtapositions, such as the presence of some disused buildings adjacent to some centres of interest located in areas of maximum architectural and technical refinement or abandoned assemblies in the green area that the city "kidnapped" from the natural environment in the land avidity necessary in developments that are ineffectively controlled on horizontal.

The recovery and restoration into the economic system of the disused buildings is not only an administrative act but, several times, an ecologic one also. In the large urban centres, during the economic peaks, there is sometimes a tendency to value the land occupied by these disused structures, by full demolition of the existing background and building new assemblies and edifices which, in terms of market economy, are of interest in the area, without trying to integrate the disused building in the new investment. The new ecologic considerations (and sometimes even economic) recommend a new approach on the situation so that, following some feasibility and impact surveys, to try as possible to recover these buildings in a maximum percentage either by integrating them into the new investments or by rehabilitating and re-purposing them as objects.

[1] In current language, "the term of recovery corresponds to the meaning of restoring something usable by improving it, to re-acquire a condition that was previously lost, to re-acquire the availability to make something of which it was deprived in its functionality. These definitions make obvious that recovery is a concept and not an intervention category. With this term, it is not a methodology that it is defined, nor is there the object on which one should intervene".

In terms of recovery objectives, it should for the types of interventions to be closely interconnected in a complex system based on a strategy. This condition evidences the centrality of the edifice-town relation and the impossibility of making a split between the urban-scale policy and the projectual behaviour on building scale.

Among the disused structures, an important sector is formed by the ruins of industries that proven to be unproductive or economically ineffective in time. Nevertheless, this should not be confused with the patrimony of the pre-industrial age, which has a fully another value and historical connotation. It is about more recent constructions but which, due to the expansion of the chronological field of our historical inheritance, raise a novel issue, the one of the contemporary industrial patrimony, which despite its name, generally escapes the influence of the cultural industry. The ideal of reuse potential refrains on this patrimony.

The disused industrial inheritance raises two types of issues, different in nature and scale. On the other hand, the individual buildings, often with a solid, dark construction and with easy maintenance, are easy to adapt to the current usage norms and fall within some multiple uses, public and private. [2] "In Europe, as also in the United States, there are a lot of factories, workshops, warehouses transformed in houses, schools, theatres or even museums. The large hall of the Mouche slaughter houses, with its magnificent metallic structure, built in Lyon in

1918 by Tony Garnier, became a vivid and attractive exchange and show centre, as also the Baltard Halls would have become." This refunctionalisation, reconversion of buildings, some of which belong to the history of technique, pertains both to a historical preservation and a healthy logistic economy.
The 50s - 60s are marked by a revaluation of the plastic composition, developing a specific aesthetics, manifested mainly in the public edifices such as faculties, town halls, culture houses etc. The public modern architecture of the second half of the 20th century manifests in its expressionist or brutalist version, producing architecture parts valuable as physicality and structural-functional concept. [3] Both in terms of the "aesthetical instance" but also of the "historical instance", these examples are subject to a conservative-restorative optics, given their monumental and representational character.
But, both in the industrial and in the civil disused architecture, not all the history products more or less recent are significant in aesthetic or memorialistic terms, but on the contrary, their share is very small by relating to the majority. Meanwhile, the industrial and utility architecture overall reduced their originally undertaken plasticity and, by a simplification often reduced to strict functionalism, generated typologies recognisable throughout the world, with some variations related to the cultural specifics of the place or of the funder. The recovery of the latter will be therefore subject to economic optics.
The assembly scale is another important component in assessing the viability in re-purposing the disused patrimony. (Fig.1.)

Fig. 1 Selva de Mar, Barcelona, 2007, Photo: A. Racolța

The practice throughout the world proves us that generally, a remote object (small building or assembly) deserves to be recovered and refunctionalised, while a large assembly and, the less an industrial site, is not lending to this, but rather to a full regeneration, based on the economic optics, with or without maintaining some "historical witnesses", as with the old industrial district of Barcelona, Selva de Mar, converted in a luxury residential site.
Approaching a theme of rehabilitation of a disused building may come towards creating an advantage from such theme, benefiting from the specific architectural particulars of a building upon which a period of time has passed. (Fig.2.)
In some cases, even if it is not about a valuable entity in historical or aesthetic terms, the stamp of time left on the building surfaces, scenic elements resulting from the former designations of the places, some structural elements exposed following the in-time degradation, can be used in a scenographic manner with the aim of settling the rehabilitation and refunctionalisation theme of the respective space. The apparent value of a disused building cannot be underestimated. (Fig.3.) Structures that for a specialist seem to be compromised can become, by a careful intervention, true architectural successes. In a lot of cases, the past of the disused building is one of the reasons determining the investor to acquire and rehabilitate the building. In this case, the attraction of the novelty and uniqueness are the main supporters for recovery.

Fig. 2 Conversion of a cement factory in a multi-purpose site, author Ricardo Bofiil, Barcelona, 1975 – exterior Source: twistedsifter.com/2011/04/cement-factory-conversion-ricardo-boffil-barcelona

Fig. 3 Conversion of a cement factory in a multi-purpose site, author Ricardo Bofiil, Barcelona, 1975 – interior Source: twistedsifter.com/2011/04/cement-factory-conversion-ricardo-boffil-barcelona

Often neither the remote objects achieved on standards other than the current ones deserve to be recovered particularly when the structure is inconsistent with the new regulations (P100/2013 in Romania, as for example), or if it is intended to insert new functions involving super-complex techniques and endowments.

III. THE REFUNCTIONALISATION AND ENVIRONMENTAL REINTEGRATION OF THE DISUSED BUILDINGS

The issues generated by a disused building also expand within the scope of the urban safety, generating insecurity to the respective site. In ecologic and sanitary terms, these disused structures become insanitary and give the entire area this aspect. The new urban context generated by industries is affected by their residual part, referred to as pollution, which will induce the concept of ecology. The urban areas are mainly exposed to the harmful factors resulted following the industrialisation.
The integration within the environment is one of the major objectives when one intervenes over a disused building, the intervention is not only limited to rehabilitating the respective building, but it is an act that should also respond to the requirements to harmonize the entire assembly with the site and adjacencies.
The intervention on a disused building should be regarded as a whole, so that the overall built assembly will fall in the direction of harmonizing the inside with the outside. This direction can be developed both in a built site and in a site with a natural landscape.
It has been long since the ambient no longer means only a natural, extra-urban landscape, but it also includes aside the green areas from within the localities, all the elements forming the physicality of a public or private space, in various dimensional scales (architectural elements, details, objects, vertical or horizontal urban textures).
The sites of which adjacencies are built will give architectural loads (and potentially stylistic) to the new investment, hence to talk about an architectural success, appropriate resolutions of some detail issues will become major considerations.
Even in an urban context, the evaluation of green areas should not only limit to parks or specially developed areas, but it should also include the residual, not maintained green, resulted following the more or less coherent human interventions in the natural element by the act of building edifices, streets etc., this being also added up with the spontaneous green, subsequent to decommissioning some constructions, within the premises or even inside them.(Fig.4.)

Fig. 4 The conversion of a water tower into an establishment, Antwerp, Source: https://flavorwire.files.wordpress.com/2012/08/antwerp1.jpg

The location of a building in a natural framework employs the responsibility to not impact it by the act of building, but on the contrary, to try and re-establish a balance between the artificial and natural component because otherwise full demolition and restoring the land to nature becomes advisable.
[4] "The project of environmental requalification is grounded on the assumption of re-establishing the balance in the relation of various natural and artificial components conforming the place by an intervention that articulates various fields".
The possibilities to create built spaces not representing a brutal delimitation against the natural area provides advantages to such a site, advantages that once materialised bring additional quality to the usage. The harmonisation of the indoor with the outdoor space can be manifested either by dematerialising the envelope or by retrieving characteristic elements of the natural framework on the inside, as an extension of the outside. These can be elements of vegetal, mineral nature, representative for the specific of such site, real or re-interpreted in an abstract manner, or the thematic can be found in the materiality of the new structural, closing, compartmenting, finish or furniture elements. The emphasis on and inducing the climate meant to be created on the inside is both generated by form and material and colour.
During our times, multiple possibilities of wood processing may provide a wide possibility of plastic expression. (Fig.5.) A famous historical example is given by Alvar Aalto, by the Viipuri library.

Fig. 5 Alvar Aalto - The Viipuri Library, 1927 The conference room. Source: http://www.alvaraalto.fi/viipuri/building.htm

[5] "Its wooden furniture, designed since 1927, unites the plastic refinement of the curved shapes with the strict rationality of a revolutionary technology. Chemically treated, steamed, stratified, boiled, curved, chipped, agglomerated with various binders, wood becomes a whole-new material, ductile like steel, transforming in the hands of Aalto in a sculpting material for creating useful shapes. "

IV. TECHNICAL SOLUTIONS FOR ENERGY EFFICIENCY IN THE CONTEXT OF THE NEW ECONOMIC AND ECOLOGIC REALITIES

Any disused structure has an economic value embedded in the built mass, which also has implications in the related issues generated by manufacturing various components, which also assumes a volume of resulting polluting residue. The recovery of these structures also represents, by default, a positive response to the ecologic issues that the current society confronts with. The recycling manifested towards this direction seconded by measures aimed at employing the ecologic concepts in approaching the building methods, contributes to stopping the artificiality of the environment we live in.
[6] "With large agglomerations of population, with extreme population densities on the inside, with direct influences on the outside, the city radically transforms the natural landscape, it creates an environment of itself, an artificial one, which takes the man away from nature".
The intervention to rehabilitate and refunctionalise disused buildings also includes the technical part of energy efficiency. The new energy realities require technical solutions to lead to a reduced energy consumption and, by default, a low volume of polluting residue resulting from the use of such building. The use of alternative, recoverable energy sources represents a part from an effective and ecologic solution for the energy consumption related to the operation of a building, next to rational technical solutions adapted to the use and manner of operation thereof, hence leading to energy efficiency. The call for recoverable energy sources will be made considering the specific particulars of the site. The sites benefiting from a good sunlight will favour the implementation of the solar panels to heat the water and photovoltaic panels for electricity, if there are water sources that would allow an energy capitalisation system, it will naturally be an option. These systems can be simultaneously implemented where possible. The reduction of loss is the main task that the new technical solutions of endowment will try to solve.
To obtain energy efficiency, the rehabilitation and refunctionalisation of these places should assume the implementation of some eco-energy technical solutions capable of ensuring an effective and sustainable operation. To do this, the importance of correlating the interior technical solutions of the construction with the ones used on the exterior is essential, which influences the range of used materials.
The consecrated solutions of energy efficiency by thermal insulation used both on the outside and the inside of a building can be completed with technical solutions meant to bring additional efficiency.
(Fig.6.) The accumulation of solar thermal power in the exterior built mass of a building can be used effectively by adopting a system that will allow this, where possible. To achieve this, the thermal insulation protecting the outer existing envelope of a building in the areas exposed to sun radiation will be mounted on a movable system allowing for a certain opening, them becoming permeable when it is intended to heat the closing element and use the heat accumulated in the material mass for heating the delimited interior space, by correlation with a mobile thermal-proofing system arranged on the inside, of which opening allows thermal transfer. The system becomes functional and effective during such periods from the cold season when there is a sufficiently high sun radiation during the day that will allow accumulation in massive elements, exposed to sun; during the night, this energy will be radiated towards the inside of the building. Depending on the budget, the identification of the parameters and coordination of the system operation will be made by means of sensors and some mechanisms connected to a computer (in hi-tech version) or by sensor detection and mechanical operation directly made by man (in the low-tech version). The finishing surfaces of the mobile modules of system thermal proofing will be executed in both cases from vibration-resistant materials.

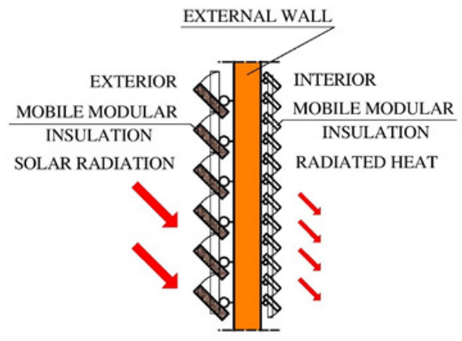

Fig. 6 Principle of solar thermal power accumulation in the built mass and radiation in the indoor space by technical system

The advantage of placing such system on the sunny portions of the building against the classic one with fixed thermal insulation consists in that the heat accumulated in the mass of the closing elements can elevate the temperature during the night on the indoor space adjacent to them by about 2°C – 3° C. These values are significant, given that temperature elevation within a building by 2°C – 3° C will be made with considerable

energy use. The system will not operate solely on winter, but it also becomes effective in the spring and autumn, when the natural elevation of indoor temperature by this method may significantly reduce the period where the premises must be heated with energy-consuming heat.
The energy efficiency of a building should be also made considering the function it will serve. Hence, in case of a sports development, of which preponderance in energy use is absorbed by HVAC systems, there can be adopted architectural solutions of partial or total opening of some parts of the outer envelope of the building, by moving some immovable walls made either from thermal-insulating glass or from multi-layer thermal-insulating walls, lightweight and opaque, on mobile rolling systems, so that during the favourable climate periods, they will open the space towards the exterior, the natural ventilation replacing the forced one, which is consuming power. If we consider that about 30 - 40% of the period of one year is represented of such favourable climate conditions, we can say that the system can lead to energy efficiency.
The system of sliding openings is more easily applicable to the structures in frames.
(Fig.7.) With the same increased applicability to the disused skeletal structures, an alternative and low-cost option of triple stratified wall might conjugate the reduction of energy use meant to thermal proofing with the ecologic one, based on recycling some elements that are hardly bio-degradable (PET bottles) and on executing some thermal-insulating sliding panels from residual wood chipping bound with clay, based on hand-made manufacturing of a wooden board rack as a framing to cast the natural mixture, the pitch of the array being equal or non-equal, with the maximum dimension of the interspace resulting following an experimental study necessary for the mixture not to crack.

The system is applicable both on sunny and shadowed facades of the construction, with the difference that in the shadowed areas, the multi-layer walls can remain fixed, if natural ventilation is not desired during the warm season. Hence, in the shadowed area, highlight is put exclusively on the thermal-insulating qualities of the materials (the two racks made only from natural and biodegradable elements that insulate on an intermediary temperature the air volume represented by the median layer of the PETs), and in the sunny ones - on the greenhouse effect induced by the plastic layer exposed to sun shines by opening the two opaque panels in the cold season. In both assumptions, the PET layer remains fixed. The inside panel should be treated against humidity and the outside one with solutions making it resistant to weather conditions, especially rain, The physicality of these panels is strongly expressive by the natural character of materiality, but also by pace and texture, which gives additional quality both to the interior architecture and to the related exterior urban space.

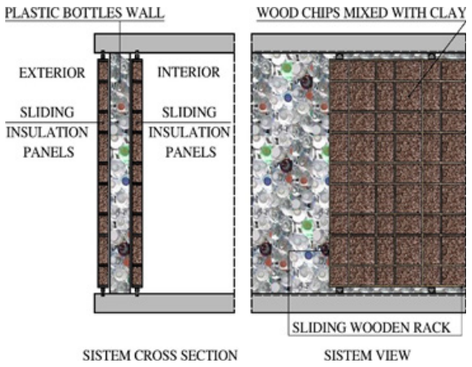

Fig. 7 Multi-layer wall, mobile or fixed, made from recycled materials

V. CONCLUSIONS

An eco-environmental reintegration project on a disused structure or assembly cannot be two-dimensional. It must be multidimensional, careful both with the microclimate and the relationship with the larger context where it is integrated, careful to green and the mineral component, to the social-community context, to the biological component but also to the anthropic use, to the targeted objectives without omitting the available economic resources.
In order to be truly a recovery project, it must identify and explore at maximum the offer of the existing elements in situ, this being the one to condition, following a very detailed analysis, the strategy, the intervention and means and

execution, by a multidisciplinary and well-articulated process.
The original imposition of a certain new function for an abandoned construction is not proven to be always viable in a recovery project. Therefore, for the success of a project using at maximum the offer of the existing elements, one should first look for a function to which the spatial, structural and functional features of the disused construction would lend to and should carefully choose materials and technologies to isolate/ recover the energy that are not too expensive, particularly if the budget is not generous. (A too generous budget usually leads to the tendency to fully demolish and make new cement, perfectly adapted to all the requirements). The implementation of the energy technologies adapted to the new function to be hosted by a disused building and the available budget is a response to efficiency and recovery of energy resources available in such site.
The involvement of the local population in producing hand-made and low-cost insulating elements necessary for the new endowment, when it is about an utility-community one, can bring both financial benefits to the ones involved in the execution and the community's attachment to the new function occurred in the urban area. There should be identified the existing natural potential, even if the residual character of the building tends to refrain also on the natural circumstantial context. In this case, the rehabilitation of the building can only be made together with the natural framework in a symbiosis based on ecology: as materials, respect for nature and by using "green energy technologies".
The ideal case for a practical applicability of the provided concepts would be as follows: the existing of a disused insulated building body, not necessarily industrial, belonging to the inheritors of the recent or older history but without aesthetic or historical value, surrounded (or invaded) by natural elements, located in an area inhabited by a population with medium or low economic level, who can be driven directly in recovering the disused structure in an environmentally-articulated manner in the sense of obtaining inside places as closest to the concept or passive or energy-independent house, by using low-cost "soft" means easy to perform (because usually super-technology is not accessible to someone who intends to recover an object based on a maximum of what it can provide), natural or artificial (the ecologic attitude of recycling some hardly biodegradable waste, such as PET), and on the outside of a balanced urban space in the relationship between natural and artificial, representing together a close functionalisation, an attractor in the urban context.

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Preservation and heritage

The extension of the living space in the attics of historical buildings

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ABSTRACT
Cities are in continuous transformation so that the interventions in historical areas are something natural. The principle of intervention should be one of revitalization and respect for the old substance. The research topic is based on the desire to reactivate the attics of historical homes into living spaces. By transforming this huge area of unused space that stands enclosed at the top of the houses the emergence of a new urban areas is stopped, bringing at the same time the population in the center of the cities.

Keywords: interventions in historical buildings, mixed use, flexibility

I. INTRODUCTION

Attics constitute the most important reserve of unused space in Romanian cities. A huge area of unused space is locked in the upper part of houses, and their use could reduce the demand for new land. This opportunity of vertical development is a challenge not only for city planners and restorers, but also for architects. The results of the study on the structure and the limitations imposed by the positioning within a historical site give us a direction regarding the form of intervention and the type of space that can be developed here, and the choice of a flexible system can offer many possibilities for changing the shape and the dimension of an interior space, depending on the social and economical impact of the real estate system. This work places the types of intervention in three classes, based on the offered space, height, relationship with the rest of the house and relationship with the exterior.

II. HISTORICAL BUILDINGS IN TIMISOARA

Timisoara's urban structure is the product of an evolution spanning several hundreds of years. The main street network and many buildings in the neighborhood Cetate were built between 1725 and 1765 based on projects designed on the drawing board. This neighborhood constituted the cultural, political and administrative center of the entire city. The Citadel's Esplanade, a 948 m wide plane, sprawled from the exterior limit of the fortifications, named the circumvallation line. On these planes it was forbidden to build, to eliminate the possibility of an eventual enemy approaching the fortifications. For this reason, the other neighborhoods of the city were built at a distance of over two kilometers. Even since the 18th century, the city was formed of several neighborhoods with a different character. These neighborhoods grew in the 19th and 20th century and united, according to a planned evolution, formind today an unitary urban organism, relatively coherent. In Timisoara there are still 14 500 historical building, representing the entire history of European architecture, from the baroque period to the inter-war period. [1]
Beside the neighborhood Fabric that had an industrial character, the neighborhoods Iosefin, Elisabetin and Mehala had rural characteristics in the beginning. Iosefin neighborhood started growing after 1890, when the building interdictions were lifted. The area includes individual or collective residence buildings, with an urban character and occupying in general three or four sides of the plot of land, most of them being built around 1900, with an average height and continuous street fronts. Here exist numerous constructions historically relevant and proposed for getting out of use. A big part of these buildings are houses with several apartments, with an interior yard, the access being made on a cursive. In the case of buildings where the habitation function predominated, the attic could have been occupied by laundries or depositing spaces divided by each apartment, and the ground floor had commercial functions.
The built fund of the historical areas is a product of temporal evolution, the interventions on the buildings being more or less successful. The modifications of the facades through the apparition of new commercial spaces or inadequate interventions on some facade elements or on the roof led many times to loosing the building's character. Due to the high economic potential, the interventions on the historical buildings appear especially at the ground floor level, the attics being avoided, although these can be valorized due to the generous space they offer. In Timisoara there are several such examples of restoring and refunctionalizing the attics, such as Theresia Bastion, the Faculty of Arts and Piarist High School.
In the historical houses in Timisoara, the baroque (Fig.1) and the eclectic (Fig.2) structural framework systems are most common.

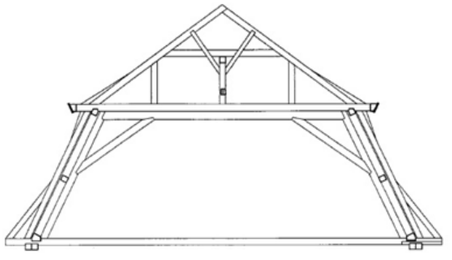

Fig. 1. Baroque framework

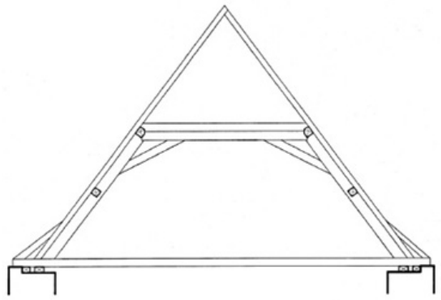

Fig. 2 Eclectic framework

The baroque framework is thus build to cover an opening o–f 6-8m. Made in Romania in the 18th-19th centuries, the baroque framework is characterized by reinforcement longitudinal systems disposed in the rafters' plane, respectively by the unloading system specific to the main frameworks. The rafters' ascent is of maximum 45°, except for the mansard type rafters, which have an interior rafters' ascent between 60° and 75°. The mainly used material is softwood, pine or spruce, with a durability of 200-500 years inside the building, in dry environment.
The eclectic structural system, as well as in the case of precedent structural systems, is sustained by the exterior wall of the building, not having any support in the middle. This system is characterized by very large openings, with a triangular framework, closed in the lower part by a chord.
The scenery specific for roofs in Timisoara is characterized by the play of volumes of big areas of roof coverings. The roofs of the buildings from the historical areas are often resolved unitarily regarding the facade plastics, the eaves and apices of neighboring constructions having the same height and similar proportions. The roof's form is not admitted for the buildings that are historical monument. The initial roof, as well as the added elements, must be maintained. In the 18th-19th centuries, the roofs in Timisoara have been covered with fish scale tiles, other elements, such as tower or frontons being covered in metal sheets. In the case of historical monuments, it is forbidden to add new windows or eyelets, this being allowed for historical houses as long as the initial character of the roof is kept. [3]

Regarding the value of the interior space and its potential in the field of interior architecture, the complexity of the resistance structure is that which brings a big advantage and creates the backdrop for an eventual development. The decorative elements are limited, the wood is decorated in few cases, as these cases were not conceived as representative for the building. They are in exchange representative from the exterior, their height giving a certain status to the building, and the eyelets, bow-windows, frontons and towers decorated in the style specific to the house bring decorative elements to the interior. (Fig.3)

Fig. 3 Fronton in an eclectic attic

The eyelets are meant for the lighting and ventilation of attics. Depending on the style to which they belong they have different shapes, bringing light in the space and allowing contact with the exterior. The original carpentry, as well as the elements included introduce the atmosphere of the relative style to the interior space and give a direction regarding the way of approaching a future development.
The towers present in some of the historical houses (Fig.3) can become a central element in case of a development, bringing a new shape to the space, closed by the wooden structure and having potential openings towards the exterior. Such a space is on Bd. General Dragalina, in Ancora Palace. This is one of the outstanding edifices of 1900s architecture in Timisoara. The

plastic language corresponding to the 1990s simplified style also uses a neogothic decoration. The tower that is marking in a significant way the corner of the building is inspired by the silhouette of medieval gothic towers. The anchor installed on the tower, facing Bega practicable channel, reminds the nautical activity, at one time intense, on the Bega. [4]

Fig. 4 Structure of a tower in an eclectic attic

III. OCCUPATION OF HISTORICAL HOUSES' ATTICS

A. Reasons for occupying the attics of historical houses

Cities are in continuous transformations, so the interventions in historical areas are natural. The intervention principle should be one of revitalization and not of museification, with respect for the old substance, with careful densification and functional complexity.
There are several ways of urban densification, one of them being the use of spaces in the attics of historical houses. This idea has led to stopping the implementation of projects such as Le Corbusier's Voisin Plan, which involved the demolition of a historical part of Paris and replacing it with skyscrapers. This plan seems inconceivable at first sight, the idea of demolishing a big part of a historical city, but the aspirations behind this plan was to resolve the urban problems confronted by Paris at the time. Le Corbusier had conceived this plan in a period of urban crisis, when, as a consequence of growth, the population had increased vertiginously, a room in apartment buildings being occupied then by several families. In 1900, in the poor neighborhoods, a toilet was used by circa 70 inhabitants, factories and workshops were located in the middle of residential areas, emitting smoke, and children were playing in courtyards where sewage waters flowed. Le Corbusier was horrified by these conditions and, to compensate the over-crowding, the old low rise buildings were to be replaced by a new type of structure, the skyscrapers. Two problems were solved at the same time by building vertically, overcrowding and urban expansion. [2], [3]
Fortunately, all this historic area was saved, but Le Corbusier's theory had an impact on urban planning, so at the outskirts appeared those dystopian residential areas, dormitory-neighborhoods inhabited by a large number of people, which become inert without having shops, offices, libraries or other mixt functions.
This problem appears also in Timisoara, in the case of apartment buildings neighborhoods, where functional mix is a very low one. On the other hand, there are the historical areas where the ground floor offers a wide range of functions, which makes these areas seem alive during the day. But this happens only at ground floor level, not at the upper levels of the houses, which are not used at maximum capacity, part of the apartments being unoccupied. If during the communist period these large apartments were inhabited by several families to use the space at maximum capacity, currently these five or six room apartments are free or occupied by one or two persons. This will naturally lead to the change of ownership and the apparition on interventions on these buildings. This raises the question who will live in these apartments, which come with big problems that necessitate major investments due to the their precarious situation, even if their price is acceptable for

the offered area. Because of the destruction of framework, the upper level apartments are compromised. The rehabilitation of the framework and of facades can bring a major benefit to the historical areas by attracting population here in a permanent way.
In many European cities, the growth of the population generates a bid demand of accommodations. Vienna introduced the principle of 'Soft Urban Renewal'. The objective is to keep the existing buildings and to improve them where necessary, but in a reasonable and practice way for the inhabitants. New buildings were limited to the outskirts and in the old historical buildings were provided commercial spaces at the ground floor and habitation spaces or offices in the attics.
The functionalization of the old buildings' basements had an important role in animating certain areas in the city, but not only they have a potential, but also the occupation and inhabitation of attics, which would bring a solution to the need of living in the center of the city, as well as the rehabilitation of the attics and a solution to the accommodation problems.
The use of attics and of unused spaces in historical houses allows the creation of new habitation spaces without creating a new urban area. It is a politic of densification beneficial at all levels, economical, social, environmental and architectural. The attics constitute the most important reserve of unused space in the cities of Romania. A huge area of unused space is locked in the upper part of houses, and their use could reduce the demand for new land. This opportunity of vertical development is a challenge not only for city planners and restorers, but also for architects.

B. Possibility of intervention

The intervention on a historical building can ensure its survival and continuity by its rehabilitation. The idea of maintaining, in opposition with the idea of replacing, the choice of conserving and reusing to the detriment of urban expansion and densification.
The metamorphosis refers to that phenomenon within the architectural shapes, representing tension between what remains and what changes in time. It means initiating a dialogue between what is conserved and what is new, maintaining a balance that guarantees memory and identity, embracing thus durability. Our most radical idea on the way time passes is change, being equally meaningless to be nostalgic for the shapes that disappear as it is to be enthusiastic for those that appear. [5]
The interventions in the attics of the historical houses seem to be partly motivated socially, as they resolve the problem of densification and accommodation spaces, but we also have to take into account the economical and juridical aspect, as well as the state the building is in.
The economical aspect is tightly linked to the state of the framework's resistance structure and to the number of interventions necessary to transform this space into an inhabitable one.
The possibility of using, of exploiting, the image of an attic is given by its structural system. The resistance structure's analysis, beside helping in establishing the historical value, can also determine the mode of intervening and the necessary effort. After making this analysis, one can reach a conclusion concerning the degradation of the elements and on the possibility of intervening on the old structure for an eventual development. There are several ways of doing this. When the entire structure is compromised, a redimensioning of the elements can be done together with the replacement of the framework, so that the new structure will resist to higher loads. If the wood elements do no need to be replaced, one can double the structure with wood elements, but the different ageing of the wood can lead to different responses to loads and thus to a faster degradation. Another option is to make an independent metal structure, which could contrast though with the image and atmosphere offered by a wooden structure.

C. Interventions in historical site

The development and modification of these spaces located in houses built in the 19th and 20th century must take into account their historical importance and the recommended way of intervening in historical sites. This need of extending the habitable space is a natural one, being reinforced by the examples in which residents from the upper levels have transformed the attics in personal deposits or in habitable spaces.

The regulations imposed in such historical sites limit the type of proposed interventions, so that the intervention keeps the specific of the interior space and atmosphere. The lighting of the space is another challenge in such extensions, because it is forbidden to create new windows or eyelets in historical monuments. Another question related to the change of the attic's role is the way in which the roof can be modified without changing the initial image of the house.
Due to the fact that these houses are in historical sites, the modification of the framework is limited, as the modification of the house's image is not allowed. From an ambiental point of view, it is advantageous to keep the roof's shape and the existing structure, as these very powerful elements contribute to creating a specific atmosphere. On the other hand, the need of extending the habitable space appears at this level also, in some cases appearing interventions at the level of the roof's shape. These interventions can be regarded also from the lighting point of view, with an advantage in obtaining a space that is more similar with the ones from the lower levels.

D. Who would live here?

Marching on the idea of densification and the necessity to extend the habitable space in the historical centers of the cities, the use of spaces in the houses' attics is an option for gaining new habitation, as well as for extending a habitation located at the upper level of the house, as long as an intervention on the house's platform is possible.
At the moment of their building, attics were not conceived as habitable space, but they had a function, that of laundry, dryer or depositing space. Currently, they are mostly free or occupied by residents in the proximity who extended their apartment there or transformed them in depositing space.
The attic of a historical house involves a different type of habitation and implicitly a certain type of inhabitant. We have the tendency to honor with the term home those places which aspect harmonizes with ours and legitimate it. Home does not have to offer o permanent residence or sufficient space to deposit our clothes to deserve this name. We need a hearth in the psychological sense, as we need one in a physical sense, to compensate a vulnerability. [2]
The image of such a habitation deviates from the classical image of a habitation space. The wooden structure, the way of introducing light, the limited visual perspectives on the city, the development in height or the compartmentalization give this spare a particular ambiance. There is also the image that people have of attics and the sentiment they transmit.
Gaston Bachelard wrote in the Poetics of Space about the attic and the abrupt stairs we always climb. It carries the sign of ascension towards the most quiet solitude. When I go back to dream in the attics of older days, I never go back down. [6]

IV. METHOD OF INTERVENTION

The attics must not be seen as having a potential just from the point of view of the space they offer, but from the one of the elements that form it, which create a particular ambiance. The resistance structure, by its complexity, become an object in space, the wood brings warmth and the image of a hearth.
The masonry, which can remain apparent, brings a new texture, introducing at the same time the tactile sense. The light is the one that completes the space and accentuates its shape, and the eyelets of the historical houses introduce original elements and the few decorative elements in these spaces.
The results obtained following the study on the structures and the limitations imposed by the location in a historical site give us a direction to the method of intervention and the type of space that can be developed. It is up to the architect to choose the method of intervention, to choose if he wants to remain faithful to the old architecture or if he will introduce a parasite architecture that tries to minimize the space and gives a contemporary image to the intervention. The passage of time leaves its print on each construction and it is up to us to choose to preserve and refunctionalize or to deny the past. The structure is the framework in which we act, it can become the dominant element or can stay in secondary plane, as a background for the new development. (Fig.5 Fig.6)

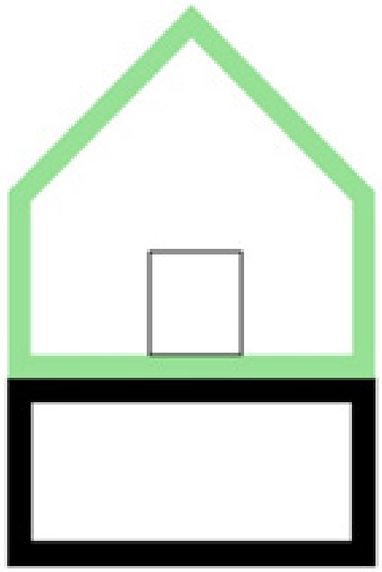

Fig. 5. The structure is left apparent and becomes the dominant of the development, all the other introduced elements are neutral.

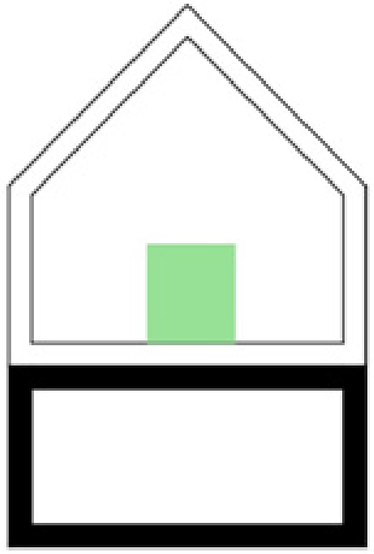

Fig. 6. The structure is not left apparent, the attic becomes a white one, the background on which the other elements will be projected

The methods of intervention are directly linked to the shape of the space, the height, the relationship with the rest of the house and the relationship with the exterior. From the point of view of the space's shape, we distinguish three different classes. (Fig.7) The new development appears in the attic's existing space, without direct link to the apartment from the lower level. This type of intervention is the one which occurs most, as it does not involve large resources. The lighting of the space is made with the help of windows in the roof. As it is about a space with a clear rhythm, in which there are no dominant elements from a hierarchical point of view, the new elements that are introduced will have an increased importance.

Fig. 7 Typologies of the interior space: a). Development in the existing space, without intervening on the structure; b). Using the existing eyelets or the apparition of new volumes at the roof's level c). Vertical extension of the space

The second category is the one in which the existing attic presents towers or eyelets or additional volumes with the purpose of gaining space. The big advantage of eyelets, beside the fact that it brings decorative elements specific to a historical house, is to introduce light and to create a visual link with the exterior, which is psychologically necessary to anyone, especially in the case of a permanent habitation. New volumes can appear to maximize the interior space. Here appears the problem of the integration in a historical site and the option of intervening with something contrasting. This intentin can appear now also in the interior, by using contrasting materials. There are interventions that deny the history of the house and the value of the structural system and propose a radically different image. An example in this sense is the extension made by Coop Himmelblau in Vienna, where at the upper level of the building appears a structure made of metal and glass that runs over the limit of the building and can also be seen from the street level.

The third category presents the possibility of extending the house vertically. This is a plausible option for houses that don't have a very high attic, in which case one can intervene at the platform's level. By this, one can obtain a spatial organization in which spaces communicate vertically, and the light can be introduce at the framework's level, but also, indirectly, from the lower level.

V. FLEXIBILITY AND ADAPTABILITY

The world is in continuous change and so is the way in which spaces from a building are used.
Flexibility is perceived in general as a response to the uncertainty of what is to come next. More specifically, it is a reflection of a system's ability to change or to react with minor interventions involving time, effort, cost or work force. Adaptability is a term very close to flexibility and refers to buildings that from the moment of their construction have the capacity to easily make changes to respond to the occupants' needs. Adaptability seeks to find a functional system where different areas can grow or can give ground, maintaining a constant part. It is applied especially to newly build constructions, in which the hierarchy can change, saving money and eliminating any inconvenience that can appear in the life of the building. [8]
Flexibility in architecture can solve problems linked to areas and functional mixity. It can offer many possibilities to change the shape and the dimension of an interior space according to the social and the economical impact of the real estate system. The growth of population in the cities to the detriment of the extension towards the outskirts leads to the attempt to find new habitation typologies in the existing spaces. The apparition of small firms leads also to the demand of office spaces, which, by annexation to the habitation space, can bring an economical benefit.
Even if in the case of historical frameworks, we have a nutshell that remains fix and a structure on which we can develop, a flexible intervention is still possible, leaving thus open the possibility of transforming the space and the function in time.

VI. CONCLUSION

The intervention on a historical building can ensure its survival and continuity by its rehabilitation. The use of attics and of unused spaces in the historical spaces allows the creation of new habitable spaces without creating a new urban area. It is a politic of densification beneficial at all levels, economical, social, environmental and architectural, and choosing a flexible architecture can solve problems related to areas and functional mixity.
If, as Adolf Loos said, every city has its own identity, finding and respecting that specificity is important in its further development. Staying true to the memory involves a correct approach of the problem to be solved, on the architecture that is to be changes, on the city in which it is located, guaranteeing thus respect for the city's identity and durability.

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The seismic vulnerability of the historical buildings of Timișoara Case study: Sfântul Gheorghe Square

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ABSTRACT
Masonry and wooden framing are the main components of the structural system used for constructing the urban tissue of the historical Cetate District of Timisoara. Progressive transformations such as demolitions, changes of use, additions or enlargements have caused a mediocre maintenance of the buildings, as seen nowadays. In order to propose an intervention scenario, it is necessary to quantify their vulnerability to seismic activity, by evaluating both their technical characteristics and conservations status, as well as the possible interactions that may occur between adjacent buildings.

Keywords: vulnerability, seismic activity, masonry, parameters, classes of vulnerability

I. INTRODUCTION

Seismic Region, characterized by its tendency to group epicenters in well-defined areas, related to a complex system of crustal faults reactivated in a tectonic trans tensional regime, confirmed by major seismic events with Mw>5.0.
The earthquakes produced so far are normal, crustal type ones, with outbreak depths between 5 and 30 km, caused by the sliding of three types of faults: a) NE-SW oriented faults, b) E-W oriented faults, c) NNW-SSE to N-S oriented faults. [1]
Although the worldwide tendency is to increase the safety level in the design of new buildings, for the historical ones, seismic activity remains the main cause of degradation or collapse.

II. SUBJECT OF STUDY

Due to the recent rehabilitation proposals for the urban space of Cetate District, more attention has been drawn over the importance of heritage buildings, that have been often neglected and left under a continuous process of adjustment according to the changing needs of their owners and tenants. At the same time, recent archaeological findings in both Unirii and Libertatii Squares as well as in Sfantul Gheorghe Square recalls its importance within the social and cultural life of the city as a whole.
The precursor of Sfantul Gheorghe Square we see today, was created in the XVIII-th century around the Grand Mosque, later transformed into a Jesuit Church in 1718. Ten years later, Count Mercy files the new “Rules of construction for the city and Cetate District of Timisoara”, that prescribed continuous street facades organized in rectangular blocks oriented N-S, E-W, named “careuri” (Fig.1.a). [2]

Fig. 1.a) Plan of Cetate District in 1744-1745

Fig. 1.b) Detail of Sfantul Gheorghe Square, extracted from the Cetate plan of 1752

Consequently, old buildings made of adobe and wood were replaced by new masonry buildings, and Sfantul Gheorghe Square’s outline maintains its triangular shape, (Fig. 1.b) until the demolition of the church, in 1913. [3]
As chosen, the object of study consists in three adjacent historical buildings located on the northern side of the square, highlighted in (Fig.2a) and b)., with the following characteristics: each organised within three levels above ground, irregular shaped in plan, covered with wooden framing with two slopes towards the street, and one slope towards the inner court.

Fig. 2.a) Detail of Sfantul Gheorghe Square, extracted from the current Cetate plan;

Fig. 2.b) Current plan of the aggregate and distribution of walls and openings at ground floor;

The slabs over the ground floor are made of masonry and generally vaulted, but over the first and second floors, they are made of wooden beams having bad connections to the masonry walls.

III. VULNERABILITY ASSESSMENT METHODOLOGY

A. General overview of the methodology

The seismic evaluation procedure is substantially based on assigning one out of four classes of vulnerability (A, B,C,D) to parameters defining geometrical and mechanical characteristics of the buildings, as represented in Benedetti and Petrini's methodology used for isolated buildings since 1984.

Based on its class, each parameter is assigned a score p, and a weight w, used to quantify the parameter's influence in the overall vulnerability of the structure [4], as shown in Table 1.

Tabel 1

Parameter	Score (p)				w_i
	A	B	C	D	
1.Organisation of vertical structures	0	5	20	45	1
2.Nature of vertical structures	0	5	25	45	0.25
3.Location and foundation type	0	5	25	45	0.75
4.Distribution of plan resisting elements	0	5	25	45	1.5
5.In-plane regularity	0	5	25	45	0.5
6.Vertical regularity	0	5	25	45	var
7.Floor type	0	5	25	45	var
8.Roofing	0	15	25	45	var
9.Details	0	0	25	45	0.25
10.Physical conditions	0	5	25	45	1

Class A is the equivalent to designing a building according to current regulations, that in normal conditions of seismic activity would not be damaged. In this case, the score equals 0. Scores can grow until 45, that is associated with class D, depending on the sensitivity of the parameter.

B. Description of the parameters

The 1st Parameter, "Organisation of vertical stuctures", evaluates the efficacy of the connections between walls, withstanding more than 70% of the seismic forces:

- Class A: buildings erected, strenghtened or repaired according to current seismic standards;
- Class B: buildings with ties between walls that are capable of transmitting efforts caused by shear forces on all floors;
- Class C: buildings without ties between walls, that are capable of contributing to the resistance against seismic actions;
- Class D: buildings without ties between walls, that are not capable of transmitting efforts caused by shear forces on all floors;

The 2nd Parameter, "Nature of vertical structures" appraises the quality of the stuctural system in regards to the following criteria: construction materials, workmanship features or execution efficacy:

- Class A: a good quality brickwork or stonework, with regular shapes and homogeneously distributed on every floor;
- Class B: a good quality brickwork or stonework, with regular shapes that is not homogeneously distributed on every floor, or is connected with a bad quality mortar;
- Class C: a bad quality brickwork or stonework, with irregular shapes connected with a good quality mortar;
- Class D: a bad quality brickwork or stonework, with irregular shapes poorly connected;

The 3rd Parameter, "Location and foundation type" evaluates the influence of the geotechical and mophological characteristics of the soil combined fith its slope category:

- Class A: buildings with collar foundation, layed on stable grounds with a maximum slope of 5°;
- Class B: buildings with collar foundation, layed on any type of ground with a maximum slope of 15°; buildings without collar foundation, layed on rigid ground with a maximum slope of 10°;

- Class C: buildings with collar foundation, layed on any type of ground with bigger than 15° slopes; buildings without collar foundation, layed on rigid grounds with slopes between 10° and 25° or clay grounds with a maximum slope of 15°;
- Class D: buildings without collar foundation, layed on rigid grounds with more than 25°slopes or clay grounds with more than 15° slopes;

The 4th Parameter, "Distribution of plan resisting elements", is defined by the ratio between the ultimate resistance of vertical elements C, and the general resistance expected for the seismic area C', based on the result of equation (1):

$$\alpha = \frac{C}{C'} \quad (1)$$

The resistance of the vertical structure is calculated using the equation (2):

$$C = \frac{a_0 \tau_k}{qN}\left[1 + \frac{qN}{1{,}5 a_0 \tau_k (1+\gamma)}\right]^{1/2} \quad (2)$$

where,

- a0=A/A1
- γ=B/A
- A1= built area
- Ax,Ay = the total areas of the walls in two orthogonal directions
- A= min(Ax,Ay)
- B= max(Ax,Ay)
- τk = tangential strength of the building's masonry
- q = ratio between the weight of the walls at ground floor and the built area
- N = number of floors above ground

Therefore, based on the value of α, the following classes may be assigned to the parameter:

- Class A: $\alpha \geq 1$
- Class B: $0{,}6 \leq \alpha < 1$
- Class C: $0{,}4 \leq \alpha < 0{,}6$
- Class D: $\alpha < 0{,}4$

The 5th Parameter, "In-plane regularity", depends on the shape of the building in plan, and it is evaluated through the indices $\beta 1 = a/l$ si $\beta = b/l$, according to Fig.3.

Therefore,

- Class A: $\beta 2 \geq 0{,}8$ $\beta 1 \leq 0{,}1$
- Class B: $0{,}8 > \beta 2 \geq 0{,}6$ $0{,}1 < \beta 1 \leq 0{,}2$
- Class C: $0{,}6 > \beta 2 \geq 0{,}4$ $0{,}2 < \beta 1 \leq 0{,}3$
- Class D: $0{,}4 > \beta 2$ $0{,}3 < \beta 1$

The 6th Parameter, "Vertical regularity", considers the possible mass differences between levels that may cause discontinuites of the structural system in section.

- Class A: Buildings with even mass distribution on every level; buildings with decentered but continuous structural elements; buildings having withdrawals of less than 10% the buil area;
- Class B: Buildings with small porticoes or loggias of less than 10% of the floor's built area; buildings having withdrawals of less 10-20% the buil area;
- Class C: Buildings with porticoes or loggias of 10-20% of the floor's built area; buildings having withdrawals exceding 20% of the buil area; buildings with towers with a height of less than 2/3 of the height of the main body;
- Class D: Buildings with porticoes and loggias exceeding 20% of the floor's area; buildings with towers with a height exceeding 2/3 of the height of the main body;

If the irregularity is due to porticoes at groundfloor, wi= 0,5, otherwise, wi= 1.

The 7th Parameter, "Type of floor", depends on the following conditions:

a. insignificant deformability of the floor
b. effective ties betwen walls and floors
c. nonexistent staggered floors

- Class A: a,b,c
- Class B: a,b
- Class C: b,c
- Class D: none of the above

In case of different horizontal structures, the worst situation is taken into account.

For this parameter, wi = 0,5 /α0, whereasα0 is the ratio between the number of class A or B floors, and the building's number of floors; wi=1 if wi>1;

The 8th Parameter, "Roofing", analyzes the roof

typology and possible pushing actions on the walls:
- Class A: flat roofs or wooden framing without thrusting, layed on concrete collar;
- Class B: wooden framing without thursting, layed on masonry;
- Class C: wooden framing with thursting, layed on concrete collar;
- Class D: wooden framing with thrusting, layer on masonry;

For this parameter, wi= 0,5 +α1 +α2, where:
- α1=0 or 0,25 in case the roof is made of reinforced concrete or weighs more than 200 kg/m2;
- α2=0 or 0,25 in case the ratio between the roof's perimeter and the total lenght of the support area exceeds 2;
The 9th Parameter, "Details", evaluates the probability of non-structural elements such as chimneys, cornices, balconies, partition walls, and so on, to collapse partially or totally based on their connection to the structural system.
- Class A and B: buildings without details, or details that are well attached to the structural system;
- Class C: buildings with small details that are poorly connected to the structural system;
- Class D: buildings having poorly connected or degraded details that could cause dammage in case of earthquake;
The 10th Parameter, "Physical conditions" evaluates structural imperfections related to the state of conservation of the building:
- Class A: Good masonry without cracks;
- Class B: Buildings with small cracks that have not been caused by earthquakes;
- Class C: Buildings with 2-3 mm wide cracks caused by earthquakes, or in a mediocre state of preservation;
- Class D: Masonry with serious degradation, caused by out of plane mechanisms;
The seismic vulnerability of isolated buildings is measured through the Iv index, calculated as sum of all scores pi multiplied by the corresponding coefficients wi.

C. The calibration of the methodology for buidings in aggegates

In order to properly evaluate the Iv index in case of adjacent buildings, the methodology is supplemented by adding other five parameters, regarding differences or similarities between them, such as: the proximity to blind walls, position in the aggregate, height of slabs, structural system differences or percentage opening differences among adjacent facades. [5]
As a consequence, the vulnerability index Iv may increase or decrease according to the assigned scores for parameters 11-15 described in table 2.

Tabel 2

Parameter	Score (p)				w_i
	A	B	C	D	
11.In elevation interaction	-20	0	15	45	1
12.Plan interaction	-45	-25	-15	0	1.5
13.Number of staggered floors	0	15	25	45	0.5
14.Structural or typological heterogeneity among adjacent structural units	-15	-10	0	45	1.2
15.Percentage opening difference among adjacent facades	-20	0	25	45	1

The 11th Parameter, "In elevation interaction", depends on the height of the adjacent buildings:
- Class A: The adjacent buildings have the same height (Fig.4.a);
- Class B: One adjacent building is higher, and the other one is either higher either the same height (Fig.4.b and c);
- Class C: One adjacent building is shorter, and the other one is either higher either has the same height (Fig.4.d and e);
- Class D: Both adjacent buildings are shorter. (Fig.4.f)

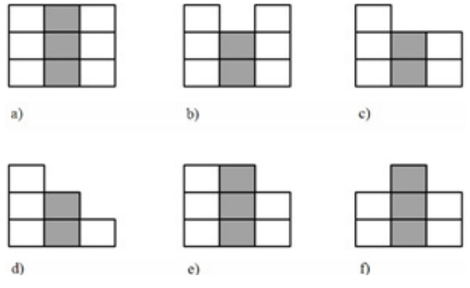

Fig. 4. Possible in elevation interaction

The 12th Parameter, "Plan interaction" is evaluated by identifying the position of the structural unit in plan:
- Class A: The building is located between 3 other buildings (Fig.5.a);
- Class B: The building is flanked by other 2 (Fig.5.b);
- Class C: The building is located on the corner, flanker by other 2 buildings (Fig.5.c);
- Class D: The building is located on the corner, flanker by only one building (Fig.5.d);

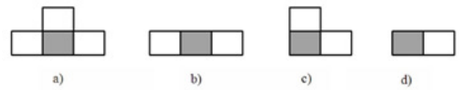

Fig. 5. Possible in plan interaction

The 13th Parameter, "Number of staggered floors" evaluates the possibility of having additional forces caused by the interaction between the building's walls and the adjacent building's slabs. In order to consider this effect, there must be a minimum of 50 cm between staggered floors.
- Class A: If there are no staggered floors (Fig.6.a);
- Class B: If there is one set of staggered floors (Fig.6.b);
- Class C: If there are two sets of staggered floors (Fig.6.c);
- Class D: If there are more than two sets of staggered floors (Fig.6.d and e);

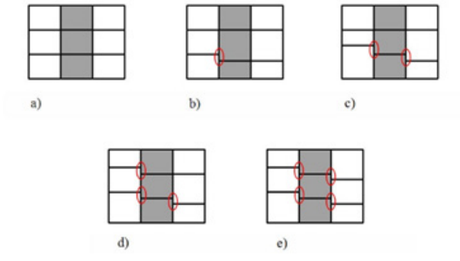

Fig. 6. Examples of staggered floors

The 14th Parameter, "Structural or typological heterogeneity among adjacent structural units" considers the difference of structural system or masonry quality between adjacent buildings in the aggregate.
- Class A: The adjacent unit has a different and better structural system;
- Class B: The adjacent unit has the same structural system, with better masonry;
- Class C: The adjacent unit has the same characteristics;
- Class D: The adjacent building's masonry is worse;
The 15th Parameter, "Percentage opening difference among adjacent facades" evaluates the distribution of forces between the facades of adjacent units.
- Class A: The difference between the opening percentages of the adjacent buildings is less than 5%;
- Class B: The difference between the opening percentages of the adjacent buildings is of 5-10%;
- Class C: The difference between the opening percentages of the adjacent buildings is of 10-20%;
- Class D: The difference between the opening percentages of the adjacent buildings is more than 20%;
Therefore, the vulnerability index Iv is calculated using the following formula:

$$I_v = \sum_{1}^{15} p_i w_i \quad (3)$$

IV. CASE STUDY – SFANTUL GHEORGHE SQUARE, TIMISOARA

The three buildings, belonging to the northern side of Sfantul Gheorghe Square were erected in the early XVIIIth century and have suffered in time additions having the same structural system of masonry and wooden framing.
The foundtion ground is almost even, without inclinations associated with values that could increase the vulnerability index.
Parameters 1, 2, 7 and 8, were assigned maximum score due to their lack of reinforcements and bad connections between horizontal and vertical elements: walls, slabs and roofs.
Also, a maximum value has been assigned to the 10th parameter, due to the bad state of conservation of all three buildings today. Multiple cracks are proof of weakness in the structure,

that has already collapsed on the northern side of unit Sfantul Gheorghe 4.
In exchange, minimum scores have ben assigned to parameters 6 and 9 given the absence of porticoes and loggias or other poorly connected details that may diminish the general resistance in case of seismic activity.
The result of applying the Benedetti and Petrini methodology for isolated buildings, on the three units, shows that all of them share the same vulnerability index Iv= 247,50.
After assigning values for the next five parameters that are specific for aggregate buildings, each index receives individual values due to differences caused by location in the aggregate, staggered floors, and different structural system of adjacent building shown in Fig.7.

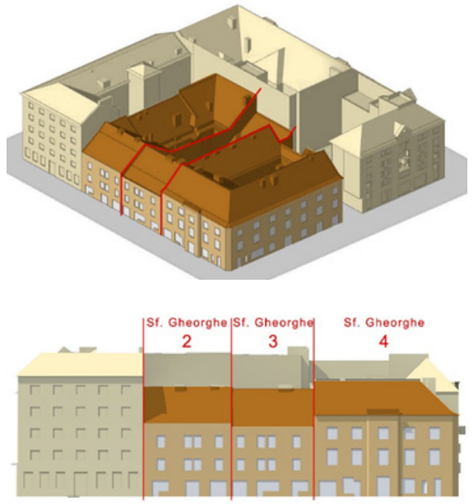

Fig. 7. a) Axonometric view and
b) Facade of the block located on the northern side of Sfantul Gheorghe Square

If the vulnerability index decreases significantly for units Sfantul Gheorghe 2 and 3, because of their location between three other units, in the case of unit Sfantul Gheorghe 4, the index less due to its unfavorable position in plan, on the corner, having only one adjacent building.
Instead, in the case of Sfantul Gheorghe 2, other factors, such as having a taller building with staggered floors on the left, may influence the growth of the vulnerability index.
As a result, the vulnerability index changes according to table 3:

Tabel 3

Parameter	Sfantul Gheorghe 2		Sfantul Gheorghe 3		Sfantul Gheorghe 4	
	p_i	w_i	p_i	w_i	p_i	w_i
1	D 45	1	D 45	1	D 45	1
2	A 0	0.25	A 0	0.25	A 0	0.25
3	A 0	0.75	A 0	0.75	A 0	0.75
4	D 45	1.5	D 45	1.5	D 45	1.5
5	D 45	0.5	D 45	0.5	D 45	0.5
6	A 0	1	A 0	1	A 0	1
7	D 45	1	D 45	1	D 45	1
8	D 45	0.5	D 45	0.5	D 45	0.5
9	A 0	0.25	A 0	0.25	A 0	0.25
10	D 45	1	D 45	1	D 45	1
11	B 0	1	A -20	1	A -20	1
12	A -45	1.5	A -45	1.5	D 0	1.5
13	C 25	0.5	A 0	0.5	A 0	0.5
14	A -15	1.2	C 0	1.2	C 0	1.2
15	A -20	1	A -20	1	A -20	1
	I_v=154.50		**I_v=140.00**		**I_v=207.50**	

In order to fit Iv onto a global scale of seismic vulnerability, and to prepare a comparative chart, values from 0 to 100 have been assigned to cover the range of indexes that can be obtained through the studied methodology.
Considering 0 as the minimum value obtained for assigning to all parameters class A, and 100 as the maximum value obtained for assigning to all parameters class D, the range [0, 100] would correspond to the range of vulnerability indexes [Ivmin, Ivmax], where Ivmin= -125,50 and Ivmax= 515,25.
For the Sfantul Gheorghe Square case study, the chart described in Fig.8 is obtained.

V. CONCLUSIONS

The present methodology can be used as a tool for the quantification and comparison of the seismic vulnerability indexes of historical buildings on an urban scale.
Based on the results obtained through calculating the vulnerability index of buildings, maps of vulnerability and evacuation scenarios can be easily drawn and interpreted by identifying potential jams that may occur immediately after earthquakes, or the shortest way to available shelters.
At the same time, the results are useful in defining a large-scale intervention plan for the revitalisation of historical centers, both for Timisoara and beyond.

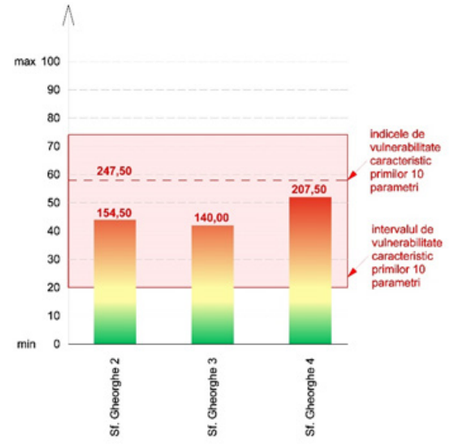

Fig. 8. Vulnerability chart

PERSONAL CONTRIBUTION

Personal contributions of the authors:
- the preparation of surveys and site inspections;
- the summary analysis of the quick methodology used for evaluating the seismic vulnerability of buildings;
- the preparation of the first graphics of seismic vulnerability based on the methodology developed in Italy, of historical buildings.

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Urban design and planning

Cornereva- History and assumptions of development

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ABSTRACT
The process of improving the quality of life and economic prosperity of people living in isolated and not very populated areas is very important.
The main objective of Cornereva's development is providing a balanced, coherent and harmonious community in terms of economic, social, endowments, accessibility and quality of the environment, the existence of living and working conditions fair for all residents. Thanks to the attractive landscape in a mountain area it has a very high touristic potential.
A valuable aspect would be to implement rules on preserving the environment and protecting the integrity of the natural and built heritage by educating people about preserving the identity of the place.

Keywords: development, rural, identity, protection, tourism

I. INTRODUCTION

Cornereva is located in Caras-Severin county in the south-western part of Romania. This village occupies the eastern extremity of the county, being located near the interference of Almăjului Depression and Depression-Domaşnea Mehadia, the latter being situated in the Timis-Cerna corridor in the area separating the western end of the Southern Carpathians, represented by Cerna Mountains. On the territory a big part of the Cerna Mountain chain ranges with mountain peaks exceeding 1800 meters altitude and with a depression where Cornereva sits. To the south this depression comes in contact with the Timis-Cerna corridor and continues to the north over Furca Obiţii with the Rusca-Teregova depression. In the depressions created by watercourses are found areas of arable land, the rest being alpine pastures, meadows, forests and rocky cliffs.
Following the administrative-territorial organization in 1968, Cornereva commune, a mountain village with a special relief and dispersion is composed of 40 villages, from this point of view is the biggest common in Romania, namely: Cornereva-center, Arsuri, Bogâltin, Bojia, Borugi, Camena, Cireşel, Costiş, Cozia, Cracu Mare, Cracul Teiului, Dobraia, Dolina, Gruni, Hora Mare, Hora Mică, Ineleţ, Izvor, Lunca Florii, Lunca Zaicii, Mesteacăn, Negiudin, Obiţa, Pogara, Pogara de Sus, Poiana Lungă, Prisăcina, Prislop, Ruştin, Scărişoara, Strugăsca, Studena, Sub Crâng, Sub Plai, Topla, Ţaţu, Zănogi, Zbegu, Zmogotin and Zoina of which the most representative are: the village Cornereva (village center) and Bogîltin village, which was several times independently, constituting a distinct community.
In terms of city sizes, these villages fall into the category of small settlements with less than 1,000 inhabitants. The density is 0.15 territory localities / sqkm in the whole area including the commune in the category of low-density settlements. [1]

II. CHRONOLOGY

The few traces of archaeological materials found in the Cornereva commune, attests that the town has a millennial past, although it would seem that the great isolation contradicts this. (Fig. 1)

Fig. 1. The oldest photo in Cornereva

These lands were part of the Roman Empire until 271 d. AD., when the Aurelian withdrawal occurs. After the withdrawal of Roman domination, the settlements of the Cerna valley and Timis will be organized again as village communities led by Juiz . Because of people migrations, the following period is pretty tough for most of the area, but probably Cornereva commune was protected from invasion because of the isolation.
Cornereva is first documented in 1518 and belonged to the district Caransebeş, as evidenced by a noble diploma. The village Bogîltin is certified before, in 1452, and belonged to the District Mehadia. [2]
In 1543 the town is mentioned as "Konyorova". Later in 1584 is called " Kanyorova "and in 1603," Kuneirova ". Of course, all these names are magyarized forms of CORNEREVA, romanian word that originates in the word "cor-net" (= place with horns). [3]
To understand the major events that occurred in the history of these lands, we must fit them into a larger and wider context and to tie the major historical events that took place in the Kingdom of Hungary or later in the Habsburg Empire.
The rivalry between Turks and Austrians in 1788

will generate a new conflict. During this war Cornereva's inhabitants actively participated in the battles of defence. Violent battles with Turks took place at the place that today is called "Turkish soil" or "red earth", as it is said that the earth here became red from the blood, after the fierce battles. This place is located at the boundary between Cornereva village and Cornea village. (Fig. 2)

Fig. 2. Cornereva cca 1788

The First World War 1914-1918, which will lead to the fall of the Austro - Hungarian will fulfill the desire of Transylvanian and Banat to unite with all romanians in Romania Mare. In this conflagration Cornereva paid with the lives of 138 people. After the Great Union, in Cornereva, as in all the villages in Banat the Romanian administration is installed. (Fig. 3)

Fig. 3. Cornereva cca 1914

The economic situation in the period following the war is precarious. After, in the period between the wars, the economic situation of the village is gradually improving. Horse-drawn farm machinery appear: the thresher, the fanning, the drill etc.

In the period preceding the Second World War in Cornereva the activity of legionnaire groups intensifies, imposing their authority by appointing a mayor and notary who represented them. The Second World War produced in Cornereva and across the nation a great suffering.

Romanians of these places had to pay a new tribute of blood to return to the country's body a part of the lost territories in 1940.

The communist dictatorship that is singeing the entire Romanian society since 1948 installs in Cornereva too. The communist bodies of the district and region, after the Soviet model, names "presidents" at the head of the local councils. The action of "collectivization" of land in the village was not successful in Cornereva. The anti-communist resistance of Cornereva's residents is well known. Many "cornerevinţi" enlist during 1948-1953 in anti-partisan units that were taking refuge in the mountains, where they resisted fiercely.

In 1955 the first passenger bus is introduced on the route Cornereva - Orşova. Electricity was introduced in 1962 in the village, and in 1964 forestry exploitation opens. Since 1980, from the administrative point of view, the commune consists of 40 villages (hamlets), whose center is Cornereva-village. [3]

In conclusion we can say that these lands were always inhabited by Romanian people that, despite the adversities of times that continued to live in these places in natural areas that were different even to those immediately close.

III. THE EMBLEM OF CORNEREVA. DESCRIPTION AND MEANINGS

The emblem of Cornereva's village, consists of a triangular shield with rounded edges. (Fig.4) In a green field is represented an uprooted tree, accompanied right and left by two sheep grazing, all silver. On the top of the shield is a oundation belt, formed by two fascias united with silver. The shield is stamped by a silver mural crown with a crenellated tower.

The sheep symbolize the occupation of the inhabitants, livestock. The tree represents a fruit tree and symbolizes the main economic source of the area. The two united fasces of the foundation waist symbolizes the bed streams of

Ohaba and Ramna that form the Bela Reca river at their confluence. A crenellated tower mural crown means that the town has the rank of commune. [3]

Fig. 4. The emblem of Cornereva

IV. THE SKETCH OF THE EVOLUTON OF THE SETTLEMENT

The commune villages have a dispersed structure except Cornereva and Bogaltin which are more compact. Cornereva was developed on Belareca river valley and Bogaltin lies on the south of Cornereva, on the Ciumerna river valley.

The remaining villages and hamlets were developed around former seasonal dwellings, due to large distances to their places of residence. Housing is generally good, with a majority ground floor buildings, in central areas, on the main streets were built P + 1 or P + M houses.

The variety of typologies is large due to the area strongly shaped by the nature. Cornereva and Boglatin are two irregular organized centers and around them 38 dispersed nuclei revolve.

Cornereva is part of an almost continuously complex of settlements located in the valley and on the surrounding slopes. Surrounding areas are home to hundreds of isolated farms. The village has a structure dependent on the road, articulating the grouped, irregular, linear, road type with the regular group, linear, with branches type, with the grouped irregular type and with irregular network and with regular focused type with deformed network. At the extremities and their surroundings, the structure is dispersed (discontinuous), plateau and valley. (Fig. 5)

Fig. 5. Cornereva - current general plan

This village is characterized by the "organic" site occupation, oscillating between the valley, the heights and the surrounding slopes.

After the eighteenth century the village supports a partial systematization, the hearth being grouped and structured quasi-geometric. Surrounding dwellings do not disappear, as shown in the 1884 military plan, and the next century will not change the configuration. [4]

The batching system is the result of the Austrian systematization where compaction and regularization intervened on the old structure. The batches tend to be regular, but are very different in size and sometimes as a form. The deformation of the batch is given by the complicated valleys.

They have different widths (approx. 12-15 - 40-50 m) and lengths of approx. 20-120 m. The batch soars to the steep slopes limit. Most batches have the main courtyard and the garden specific in Banat. The courtyard is organized very diverse, from simple residential buildings associated to some annexes with different positions to complete the closure of an inner courtyard. It stands a large variety of partial closure, leading to plans in "U" form, oriented to the

street or garden or “C” form. There are households in which the buildings around the courtyard are articulating other household buildings from the garden or street. Around the village there are a large number of the dwellings, some of which are “ocol inchis” type [5]
Materials commonly used are stone, wood, earth and brick in modern times. In Cornereva we can see a relatively rare case in mountainous Banat, of the building built of stone and reinforced with wood accessories.
Outdated and not repaired residential buildings can be found on mountain slopes due to difficulties arising from the transport of materials and labor shortages in the construction sector.

V. NATURAL, URBANISTIC AND ARCHITECTURAL TRADITIONAL VALUES

At the end of the eighteenth century the religious service was officiated in a wooden church. Cornereva’s current church was built between 1797 and 1805 refurbished and repainted in the years 1821, 1836, 1888, 1935, 1975 and 1982. Regarding the church’s local architecture, it is built in the style of Viennese baroque with wide arches from which are hanging chandeliers. The iconostasis is a unique beauty and is the jewel of the church. The church has some religious objects such as icons painted on wood, with heritage value. Some of these icons are at the Metropolitan Museum of Timisoara. It is worth remembering that in 1937 the church was visited by our great historian Nicolae Iorga. The scientist left his autograph on one of the church books, but unfortunately disappeared. (Fig.6) [6]
The Bogaltin hermitage came out from the desire of the believers to have a place blessed near the Cornereva’s mountains where the monks can pray unceasingly for the world. The cornerstone of the church was laid in 1949, the construction of the hermitage was directed and executed by founder Ioan Radulescu with the support of the believers from Bogaltin, Cornereva and Almăjului Valley. The consecration of the church was done on 8 July 1959 by Metropolitan of Banat, Vasile Lazarescu. Monastic life began with the arrival of Father Alexis Udrea but did not last long as the decree 410 of 1959 hermitage was abolished and passed to Bogaltin parish administration. Repairs were done in 1978 by the archpriest care of Dimitrie Grama. (Fig.7)

Fig. 6. Orthodox Church Cornereva

Fig. 7. Bogâltin hermitage

In 2008 the Diocesan Council of the Diocese of Caransebes changed the destination of the monastery making it the nunnery, which currently undertakes strengthening works to improve church and monastic ensemble.
- Historical Monuments of Cornereva:
- Ansamblul de mori din Cornereva
- Moara lui Lazăr Boască
- Vâltoarea lui Nicolae Nemeș
- Moara lui Nicolae Nemeș
- Moara Popeștilor
- Moara de la Pod
- Moara lui Nistor Gherescu
- Moara lui Nicolae Brânzei
- Moara lui Adam Gherescu
- Moara Poloieștilor
- Vâltoarea Poloieștilor
- Situl arheologic de la Cornereva
- Parcul National “Domogled – Valea Cernei” (rezervatie naturala)

Parcul Național Domogled - Cerna Valley is a protected area of national interest corresponding IUCN category II (national park, special area of conservation)
In Domogled Cerna Valley there are 34 tourist routes, 20 routes of which are approved and 14 are pending approval routes.
The area has great tourist potential, with the sights visiting hamlets in the area, visiting the functional water mills in the area, chapel Mariana Drăghicescu, karts topography, impressive gorges. [7]
The implementing method of building in a protected natural area is very important. Construction and developments that may affect the sensitivity of the geographical areas with special protection (wetlands, coastal areas, mountain or forest reserves and natural parks, etc.) as well as landscape areas with great value, especially if the proposed building have a volumetric and architectural aspect that depreciates the value of the landscape. The ban can be established after impact studies in accordance with Law no. 137/1995.

VI. ASSUMPTIONS OF DEVELOPMENT

Currently the residential area of the village is very scattered, except Cornereva and Bogaltin villages that are more compact with coupled fronts of houses and especially row houses, watching street lining. The current population and relatively small demographic growth is not necessary to extend the living area in any of the villages.

The extensions proposed on individual batch were considered as subdivisions of existing batch that can be sold, leased or used by the owners themselves to construct new homes, shopping areas or productive workshops.
The valorisation of tourist routes is a very important point of development for the area. In Cornereva village is possible accommodation and meals to individuals, and in some cantons forest. At the two forest cantons there is the possibility of meal and service preparation, the road to the two forest cantons is a forest road in an acceptable condition.
The tourism potential of Cornereva village is the beauty of natural landscapes of Cerna Mountains, the opportunity to fish on the rivers of the Cornereva commune, where you can fish trout and barbel and the opportunity to practice hunting because Cornereva town has an area of 27 454 ha forest where they find shelter many species of animals like foxes, deer, wild boars, bears, etc. It can also organize horse-drawn carriage rides. [7]
By promoting tourism in Cornereva wants to encourage tourism potential which is an improvement factor of the village’s image as a tourist destination and drive economic competitiveness. [8]

VII. CONCLUSIONS

Cornereva village is a natural place with special environmental conditions which highlights the historical, archaeological and caving potential of the area.
Housing conditions in rural areas still do not satisfy the population’s needs and the direction of migration in Cornereva is from rural to urban. In advanced countries, the migration was stopped; instead it emphasizes daily oscillation between workplace and residence.
So if living conditions improve in the village, one can count on a stabilization of the population, especially as longevity in common is good, and the average age is decreasing.
To stabilize the labor force in the village, with rising living standards, it may develop its own production base, the tertiary sector of services, the private sector and it is estimated that in a 10-year period, the conditions will be favorable.

The dominant function of Cornereva is agricultural in individual sector with profile of agricultural livestock, arable land is only 1139 ha, category 5/6 of fertility, the distribution of households has not yet satisfied the needs of their household. The potential of the commune provides conditions for developing their own production units such as ballast exploitation, quarry products, the forestry sector, the livestock sector in particular annex units such as processing of milk, meat and other animal products, collection and processing of berries, wicker, etc.

It is therefore necessary implementing rules on preserving the environment and protecting the integrity of the natural and built heritage by educating people about preserving the identity of the place. To respect and understand it, it's necessary to implement a local urban regulation comprehensible so the locals can learn how to respect nature and how to implement in an existing tissue.

The external appearance of the building, with all its defining elements belongs to the public space.

Examination of characteristics to identify how it would be included in the specific area by respecting the architectural aesthetics as well as local traditions, will consider the following:

• compliance of the construction;
• building materials used for roofing and exterior finishes;
• colors and details of assembly;
• Compliance of the facades and gaps location.

General sector of urban and rural areas is determined by the compliance of the construction, by volumes and by urban composition, etc.

The urban composition is the agreement of use, mode of construction, economy and visual expression, achieved by applying specific rules of architecture and urbanism and the volumes determines the overall look of urban and rural areas and urban silhouette as a whole.

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Local strategies for Dacia – The urban garden

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ABSTRACT
The urban public space plays one of the most important roles in developing urban communities. May they be public squares or isolated parcels, each of these spaces affect the locals mentally and physically. Each public space must be studied through the prism of the functional character that it outlines. In Timișoara, there is a strong movement on the restoration, rehabilitation and development of central or historically relevant open spaces, but there are few positive projects in neighborhoods with a large density of inhabitants, and collective housing. In Circumvalațiune quarter, more exactly in Dacia area, we can find a perfect example of the situation, in this case the public spaces do not satisfy the needs of self-development and of developing communities with common activities.
This article is meant to point out a present phenomenon in Dacia using research methods which concern the terrain and its residents. Conclusions naturally follow this case study, and they suggest possible subjects and strategies which take on a green alternative in modelling the public space, and implicitly the environment and communities. Also, there is a big significance to be found in maintaining a balance between the environment and its occupants, and lowering the urban stress level, by raising the life standard.

Keywords: urban gardening, urban sustainability, green alternatives, public awareness, alternative education, collective housing, life quality standard, social integration

I. INTRODUCTION

There is no precise definition for the urban public space, but there are some criteria which suggest some characteristics present in most of these places.
These qualities also define the standard of life. Among these, the most relevant are nature and access to water. Other factors include accessibility to the area, and to open space, but also tidiness, impact on the collective stress level, etc. Functions are usually dependent on the inhabitants, the location, the size, the year season and in some cases even of time of the day. Each public space defers from culture to culture, but there is a green factor which builds up a common denominator across the globe and the collective human consciousness. (Fig.1)

Fig. 1. Diagram, ramifications for Life Quality Standard Source: www.bakbasel.ch

Romania's public spaces have become victims of the society in the matter of the subject. By acknowledging the effect these places have had on communities along the history, there is a lesson to be learned concerning the need for open spaces and their impact on civilization. Amongst the most prominent periods of time when there is an evident connection between humans and the need of public spaces there are some landmarks worthy of mentioning.
First there is the archaic period when people used open spaces and public domains in a minimalist way by improvising markets and events on special occasions. Smaller parcels, were also more taken into consideration, they assured a simple and lively landscape as well as constant occupation for the communities. This means that these places were also social places which tied together different people with the same interests.
The second period of time can be observed pretty late in the evolution of Romania, at the time of the monarchs. Even though late, this period is known for the transformation of the open public spaces from the simple green spot to a spectacle scene. The urban spaces also change their shape because of the new structures and imposing buildings which outline them. Because of the evolution up to this period in time we can admit the fact that the places have by then reached a climax.
The downfall in urban public space appreciation comes in history alongside the period of communism. Collective housing, forced urbanization, concentrated neighbourhoods, build up a tragic point in the evolution of these places. Although the parcels around the collective housing projects used to give the impression of tidiness, the functions where mostly reduced to one: separating the public from the private, and isolating. As imagining alternative ways of life was strongly discouraged, the urban public space has started to mean less to the locals, losing its identity in time.
The 1989 Revolution marks a new beginning of perception of the world that evolves around us, where people begin to understand more, and are more open minded, but it also marks the beginning of a consumer oriented society, which forgets the roots and relationships it should have with different phenomenon like nature. This means that even though the oppression had ended, the life quality standard did not grow, because of the lack of knowledge and interest for alternative ways of living.
Today we find ourselves trapped between different mentalities, different cultures, but willing to find a way not only to adapt the environment to our needs, but also to adapt ourselves to the environment.
The situation in Circumvalațiune quarter illustrates a good example of what was and of what could be in an area with specific qualities, with functional and dysfunctional places.

II. THE ENVIRONMENT

The subject will be studied with help of some analysis concerning the quarter in comparison with the rest of the city – as a whole, but also as

smaller units, which will indicate the more positive and the most negative effects on urban life.

A. The constructer environment

In Circumvalațiune quarter, besides the collective housing, there are two types of constructions, defined by their utility or lack of it. Some of these places are individual buildings while others occupy the ground floor of some buildings. Examples of types of buildings which are being constantly used and the ones which have been useless sometimes merge, mostly because of the lack of a precise record of the destination of these places. Presently, there are some hot-spot places, for sport, cult, market, schooling and others, but these places do not satisfy the need for demand in this quarter. (Fig. 2)

Fig. 2. Lively space, Dacia Park

Smaller constructions include some garages which also build up a case study in the subject. Although there seems to be plenty of concrete, the neighbourhood lacks in integration for the use of the community. For example, there are a lot of garages which are not currently being used, although the demand for storage places is high. (Fig. 3,4)

Fig. 3. Garage place, example of functional and dysfunctional yard

Fig. 4. Street example inside Circumvalațiune

Another example of building, which is only partly used, is the former cinematography Dacia, which could be used in the favour of the people, who instead walk by it daily, as a meeting point. (Fig. 5)

Fig. 5. Dacia area from above, observable constructed density, parking lots, commercial ground floors, sidewalk in front of Dacia Cinematography

The central part of Circumvalațiune neighbourhood, Dacia area, includes some particularly interesting places, with a high potential of usage. Currently, the so called economical centre of the area, concentrated around Burebista street, is the main attraction point of the area. One of the problems encountered here are the functions attributed to the commercial ground floors. Most of the functions present here are pharmacies, gambling places, and some bars, which indicate actual types of activities in the area. These statistics show a decline in the evolution of the social environment in the community.

On the street level, other flaws can be observed like the lack of a correct infrastructure. There are many streets with no or discontinuous sidewalks, which also create a dangerous environment for young generations who are forced, as a result, to play in the streets. (Fig. 6)

Positive areas are very observable, mostly on days with good weather. Because of places like Dacia farmers market and the mostly overfilled Dacia park, the vague idea of community gathering outside in social space is being unconsciously supported, and developed.

Fig. 6. Intrarea Umbroasă street, although a one-way car street, visitors still use it in both ways. It is also the usual preferred playground for the children who live here. The lack of sidewalks is strongly obvious here.

B. The social environment

There is an obvious gap in the social environment in Circumvalațiune quarter, caused by the reduced number of places where locals can get together and form communities. Also, the most obvious misunderstood relationship is between the elderly - who have been living here since the opening of the area, and the newcomers – students who rent out. There is a certain mistrust, which influences attitudes by default.

Most of the social happenings take place in the park, at the market or at church. The common denominator is the fact that it happens outside. In the evening and at night, the situation changes. If during the day there is a certain familiarity to the area, with busy locals roaming the streets, as the day ends, it can turn into a dangerous neighbourhood, thanks to the labyrinth created by the infrastructure, by street corners with bad street lighting, and by certain groups of less understanding people, generated by the functions of some neighbourhood companies.

Some centres of common interest could ensure alternative activities for the locals, increasing the safety in the area, even during the later hours.

Open places can also be re-evaluated, and revived. Changing the function, especially in the green parcels around the collective houses, will also bring a positive response from the local community. (Fig. 7)

By increasing the number of alternative activities, more people can join the community. Projects can be implemented starting with the younger generations as well. Education in the spirit of alternative living, self-sustainability, green living, should be a priority towards improving the understanding in the matter of future generations.

Fig. 7. Unused green parcel surrounding the collective housing projects. There is a noticeable lack of interest concerning these resulted open public spaces

By creating new hot-spots with an interactive urban design, new activities can be created, joining participants of different, ages and cultures. With the help of some changes, the social space will move from inside - out in the open space, and revive a strong new social bond between people.

C. The natural environment

Circumvalațiune quarter includes of a big number of green parcels, open public space, which are sectioned by buildings and street corridors. As mentioned before, the general impression is that these places are abandoned, aside of some exceptions. The parcels around the collective houses are not practically arranged, there is an obvious lack of inspiration in the landscape, and in most cases not cared for. It would seem that green parcels lose ground before other needs, like parking. (Fig.8)

Another observable negative characteristic is the perception of parcels as rest patches, which in many cases not only occupy, but also complicate the perception of urban open space. Detours are mainly created because of the lack of optimized usage of the resulting parcels.

The main reason for the creation of these parcels should still remain present: a buffer zone

between the public and the private space, and creating intimacy even for people living on the ground floor, but it should be updated to today's needs. (Fig. 9)

Fig. 8. Backyard, improvised parking space between the collective housing projects

Fig. 9. Front yard, the entrance alley into the collective housing projects, connecting the building directly to the one-way street

There can be more types of parcels, located in different spots around the block. These places can address younger generations, and elderly, offering more activities than playing in the street. Some of these activities can include urban gardening, to create awareness among locals, or just relaxing spots, where with the help of some simple urban furniture, the unused space can be turned into a lively and friendly area. (Fig. 10) A project of these proportions also teaches community responsibility, which means that this will not only be a one-time event, but it must become a habit and part of an entire process.

Fig. 10. The University of Massachusetts Amherst, project for presenting the concept of permaculture Source: urbansustainability.snre.umich.edu

III. ACCESSABILITY

There are a lot of access points around the neighbourhood which link the area with the centre and with the edge of the city, but the situation is different in the interior of the quarter. Because of the favourable location of the neighbourhood, there is currently no need for an improvement in the public means of transportation here. It would also be unpractical to introduce larger public means of transportation because of the present layout of the infrastructure.

The preferred means of transport in the area is currently by car, which turns a big surface of the open space in parking lots. The most evident problems are found in the dead end streets where on top of the fact that they are narrow, they become used for the sole purpose of parking. There is also a lack of accurate indication for the inside of the Dacia fortress streets, and the situation is worsened by the labyrinth created because of the constant one-way streets, but also because of spontaneous factors, like imaginative parked cars. There is a deficit in the number of parking space, mainly because the large number of cars present in the neighbourhood is not precisely estimated. To the constant neighbours, there is a considerably large number of visitors who park in the area, which means that there are two types of traffic fluxes: the first is the active one, consisted of people who constantly use the private means of transportation, and the passive one, which include mostly the locals who live in the area and who do not use the car on a daily basis.

While taking a walk through the streets, another phenomenon can be observed: a lot of cars seem to be abandoned, or haven't been moved in quite a while. (Fig. 11)

Fig. 11. Backyard, improvised parking space between the collective housing projects and forgotten cars which have become tolerated in time

This indicates the need of a carefully formulated cleaning of the area, where the unused vehicles should be re-located to a more optimal place, creating free space in order to re-evaluate the present area.

Circumvalațiune neighbourhood is also an unfriendly place for bicycles, mainly because of the lack of lanes adequate for them, the lack of bike-parking space, and the high rate of thefts in the area. People usually try to secure their bikes inside of the living blocks, or on the access lane to the collective housing. Both locations are unsafe because of fire hazard.

Fig. 12. Commercial center sidewalk. Dacia Cinematography can be observed in the upper left corner. Also, the sidewalk has clearly become parking space. Source: Google Street View

Fig. 13. Intrarea Umbroasă street, example of poorly designed landscape, which forces to bypassing routes for pedestrians

Pedestrian access should be the top priority of a city quarter with the density of population found here. Despite the situation, though, as mentioned before, there are few sidewalks, where people can feel safe. Even in the economical centre of the area, most sidewalks have been taken over by imaginatively parked cars. There is an urgent need for understanding and combining the left-over natural environment with the current pedestrian needs.

IV. REFERENCE PROJECTS

On a worldwide scale, the tenancy to rediscovering not only nature, but open public spaces as primary social places, has become a priority.

Different urban public spaces have been created as a spontaneous response to the fast evolution of urban growth. Communities have been formed in this scene, and continue to attracted new members.

Most of the projects start out by taking in consideration unused areas, and reassigning new attributes.

In the United States of America there are some accurate examples of ex-industrialized places or places with high density of population, like New York, Los Angeles or Detroit, where the need of change produced new projects, which encourage people to understand alternative ways of living. This not only changed the aspect of the landscape, but also the relationships and mentalities of the locals. They have also created a new definition for the phenomenon: guerrilla gardening, and the main point is that no one actually owns a right to the place, but everyone is invited to participate in the projects.

Fig. 14. Guerilla gardening in South Central L.A., U.S.A. Communities working together by night. Source: http://biophiliccities.org/guerilla-gardening-for-a-biophilic-city/

Other place in Western Europe have also started to be more involved in the development of the environment. Locals have begun to understand

the power and importance in the immediate environment. Urban gardening has evolved in the last couple of years in countries like Germany, France, Austria and others, for awaking urban awareness, and for a better understanding of the phenomenon and its impact on the social and natural environment.
In Vienna, Austria, there is a large number of urban gardens, mainly sustained by communities. Again, people have understood the active consequences of urban growth in the past years, and the need of new alternative points of view concerning the surroundings. In addition, the small garden projects have a motto: gemeinsam garteln verbindet (2010) – which means working together in the garden ties knots [relationships]. The projects are not only a filling of the green parcels, but they instigate to common activities.

Fig. 15. Collective urban gardening in Vienna, Austria. Best use for resulted parcels in a heavily urbanized city. Source: http://www.crowdcity.com/booming-trend-urban-gardening-vienna

The amateur gardeners also receive help from the city administration. Each sector of the city receives the sum 3.600 Euro for such projects, and support from the local Parks Administration, MA 42, which helps with information about the act of gardening, and from the City Waste Administration with compost for fertile garden patches. To better understand the subject, each garden usually consists of a couple of green areas divided into smaller 3.5 x 1.5 portions.
Education also plays an important role, while the smaller gardens are visited by schools, the students of the Technical University of Vienna have brought into attention a larger project in Karls Place, by redesigning a tidy green portion of it in garden patches, which bring along new types of events, like a small farmers' market. Of course it actually is a study project, but it highlights new proposals, and serves as an open visitor centre.

Fig. 16. KarlsGarten. Students of Vienna's Technical University, enjoying the green parcels in front of the building Source: www.futurelab.tuwien.ac.at

V. CONCLUSION

There are usually a lot of deficits and problems surrounding these dense inhabitant neighbourhoods, and Circumvalatiune is, obviously, no exception. The general landscape underlines a series of constant events which take place in the area, but without taking into consideration the near environment. Effects start to come to surface under stress situations, if the numbers of inhabitants are too raised, when there is a rush-hour traffic, during summer when there is little refuge space for the locals. People have been acting around the green area, without taking into regard the advantages of the front yard.
The public space potential can be raised with help of public awareness. Small projects, like urban gardening, best illustrate the success community activities can have on the environment.
There is also a need for creating safer areas, beginning with the relationship sidewalk – street, continuing with smarter solutions to the need of development found in the area.
The lack of initiatives should not block the upsurge for a brighter future, but should motivate the inhabitants to organize themselves, when struck with the ignorance of the local authorities.
Green alternatives have been proven to raise the life standard by teaching communities about urban responsibilities, tolerance, and open mildness to the evolution of the environment.

Fig. 17. Plan of present situation in Circumvalațiune quarter, Dacia area, detailing the zones which function, and parcels which need urgent attention. Source: personal analysis, rendering

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Development oportunities in Banat's rural region
Case study Comuna Mănăștiur, Timiș county, Romania

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ABSTRACT
The rural space in Romania has a very rich cultural heritage, with a high traditional character wich varies from one region to another. The Banat Region has suffered major changes in the years following the communism regime. Now, the community of this region is not aware of it's cultural and national heritage. In consequence, a strategy of sustainable development that takes account of all oportunities that these places have to offer is necessary, before all of their value dissapears completely.

Keywords: rural development, rural tourism, agrotourism, agriculture, oportunities in rural space, Comuna Mănăștiur-jud.Timiș

I. INTRODUCTION

The Banat region has suffered major changes during the years following the communist regime and the rural build heritage is fading away faster and faster.
Still there are rural areas that have been less affected from this destroying process and that are worth given a chance, by applying strategies aware of all the opportunities that they have to offer.
Besides tradition, that is at the verge of disappearing, there are a few other aspects that reflect the dysfunctionalities of the current system: the mentality of today's village people that are not open to change, the adopted constructive models, the lack of interest of the local authorities and the external factors contribution (politics, local press, mass-media). Considering the European achievements in the latest years, we can see that all these lead, in fact, to the de-ruralisation of the territory.

II. RURAL ENVIRONMENT AT A NATIONAL LEVEL

At a national level, for identifying the ways to stop de-ruralisation it has been appealed to the study of natural, human and socio-cultural resources in rural communities, to the analysis on their level of development and of the current development policies. Therefore, the „Rural Development Programme 2007-2013" has been realized by the Minister of Agriculture and Rural Development, in order to receive funding from the European Union and Romania's government also.
According to this, the economic and social development of the rural communities depend on the existing rural infrastructure and of main services. In Romania, main services of rural communities have been known to develop very slowly, a fact that contributes greatly to the development of these areas.
The rural infrastructure, mainly the road and sewage systems, have a significant role in development of rural areas. The lack of these, affect people's health and they discourage investors.
At present, only a part of Romania's villages have sewage systems, fact that limits development and attractiveness towards the rural areas.
The culture is also a main component of Romania's villages, a field that can contribute significantly to the rise of attractiveness towards these areas, especially for the young population sector.
Although rural spaces in Romania have a high cultural heritage, that varies depending of the area's identity, these are not highly enough valorised and promoted accordingly.
Rural areas have a high potential in the following fields:
high cultural heritage
• traditions
• great variety and wealth of natural resouces
but there are recorded deficiencies in the following:
• infrastructure that is not highly enough developed
• most of the historical and cultural sites and also the traditional arhitecture are not maintained and found in a high state of degradation
• public interest areas(such as parks, commercial areas) are mainly inexistent
• deficitary services that can cover the population's needs

III. METHODOLOGY

The methodology adopted for this paper is based on a
study of the main opportunities for developing rural areas, although these are applied differently according to the area's specificity.
The main objectives that are taken in consideration are: tradition and cultural influences, population and natural landscape and also possibilities to capitalize and to exploit all of the above.

A. Tradition

The communist systematization of villages in Romania, stopped by the 89'th Revolution, seems to be resumed under the pressure of the European Community, all so that our country can achieve its goals and standards. In fact, we are talking about a fight between becoming a consumer's based society and sustainable development, fight that is felt mostly in the rural environment.
Tradition in rural architecture from Banat's region represents a natural evolution process of households according to the region's spirit. This is with time, influenced by practical utility, day

to day necessities, a fact that can explain the migration of these areas, that have never been meaningless. Therefore, tradition is what offers continuity to some processes and that adapts optimally all these context changes. In the Banat region, in modern times (following the occupation of the Habsburgic Empire) the stability of build structures is beginning to be led by rules. Following these rules, we can see that the settlement layout, form and dimension, street layout, have become stable in long term.

In Banat region, beginning with the XVIII century there has been an interpenetration of social regulation with material one (urban) and as a result we can see a mix between traditional, local pragmatism and modern globalization, resulting a new type of tradition, characteristic of this region that functions and evolves slowly until the XX century.

Outside of the „modern movement" context, tradition in Romanian space can work without getting in conflict with it.

The reason that this hasn't worked so far is that primitive capitalism and socialism have been targeting rural autonomic settlements, and they got out of control. The same traditional agriculture (that has resisted in so many areas) is today's base for European Community and globalization in general.

In the book „ Locuirea Tradițională Rurală din zona Banat-Crișana", Teodor Octavian Gheorghiu says: „ from what we can see until present, what was traditional could be obtained simple, natural, covering optimally and in a long run the real necessities of the individual and it's group, and today all of these are obtained expensive, complicated, perishable, with an alarming addiction to foreign factors, as profit with any cost, publicity, standard systems, technology". [1] He also states:" the best image of different effects can be obtained by comparing the traditional settlement, economic, functional, that produced negligible and recyclable residues with the modern settlement that is very expensive and produces mountains of garbage." [1]

B. Agriculture – as exploatation of natural landscape

We need to address and diminish the structural disadvantages in the agricultural sector as well as the forestry sector, to modernize, consolidate and restructure in order to ensure a high level of competiveness and sustainability form an environmental point of view. This will ensure a powerful system for maintaining the rural life, expanding the employment opportunities, both in and out of the agricultural sector, thus contributing to the income convergence objective, while keeping the social structure.

In the future it is intended to support the association between farmers in order to avoid extreme capital intensity and high fixed costs, allowing at the same time the efficient use of the limited capital.

Trough modernisation and restructure of the undeveloped agricultural sector there will be an increase of the conditions for better agriculture on a larger scale, this to answer opportunities that are given by the growth of the local, national and European market. Another step will be updating and restructuring of the large number of small firms with low budgets and a low productivity rate and that do not comply with European standards.

We need to embrace a balance between the economic development of the rural areas and the sustainable use of the natural resources by maintaining and increasing the rural area attractiveness as a foundation of the agricultural diversification and alternative economic activities.

To obtain this we need to implement a system of financial aid for farmers, thereby addressing the issue of land abandonment as well as providing support to farmers in maintaining or introducing environmentally stable practices. Further on a special attention will be given to help farmers and foresters to address the obligations and disadvantages imposed by the implementation of the Natura 2000 network. A financial aid will be given to the farmers and owners of forests for providing environmental services through the protection on the wild flora and fauna, the soil and water while respecting the environment objectives regarding agriculture and forestry.

We must consider the needs of two groups in the rural areas: the population that exceeds the retirement age and the active population which are either underemployed or just unemployed. With the help of the national programs the transfer between generations will be facilitated. For the unemployed active population there will be a diversification of the non-agricultural rural economy and a development of part-time farming.

The balance of these two objectives is based on the weak identified spots, as would be: low income, few workplaces, dependency of subsistence agriculture, weak entrepreneurial ability, low demographics, poorly developed social and physical infrastructure. All of these reflect also strong spots as natural available resources with a high potential for tourism, the presence of a strong inheritance in the craft field, a rich cultural and material heritage that reflects the social and economic condition in the rural environment.

C. Tourism as a value of natural landscape

In "Master Plan for the national tourism of Romania 2007-2016", initiated by the Romanian Government in order to lay down the basis for implementing a permanent approach of the development of Romanian tourism, the rural tourism is considered to cover on a large scale entertainment in a rural landscape of a rural environment, to participate or experiment activities, events or attractions that are not found in the urbanized areas. These can include national parks and national reservations, rural regions, villages and farms. This means ecotourism and agro tourism.

For the rural tourism the component that mentions the heritage, leads to a connection between the past and the present, because it offers a profound history and a permeant pattern of the world that is always in motion. Because of this the tourism today in the rural areas is influenced and idealized trough a myth of nature and is associated with the perception of the rural environment.

For the time being the rural tourism is perceived as a sub-sector with a potential for a development and in the same time it represents an employment source for the rural population, a way to diversify the rural economy and a stabilizing factor for this particular kind of population. The touristic activity may mean at the same time an opportunity to diversify the activities of the small owners from rural areas, offering them the possibility to engage in a secondary or main activity for a majority of the women.

Even though the constraints of the development principals of a stable tourism in a natural area have led to the rise of ecotourism as a distinctive form of tourism, created to respect the natural environment, the biodiversity, concurring to the requests of some categories of tourists, that want to spend their holydays in nature, it can be considered a part of the rural tourism. As opposed to the other types of tourism included in the rural tourism, ecotourism has received the highest impulse in promoting and developing at a national level, impulse that was given by the Minister of Tourism itself, that deals with numerous problems such as: the weak cooperation at a local level, limited and very poorly diversified offers, low development of the infrastructure that is specific to the ecotourism in the protected areas, the migration of the workforce, and the reduced level of education of those employed in this field.

Except for the new EU members, the agriculture of the EU is dominated by farms, which are the place of progress and the development of agro tourism. The place of the majority of the farms in Romania is taken by a low level of peasant households, the small farms holding the largest proportion. This is normal because our history was accordingly. However, the rural tourism will be even lower in the future. The rural population, in the moment when they returned into the homeland, have managed to copy the western model of a agro touristic farm and transformed their households into small businesses.

In the attempt to access the EU funds, they permanently face the severe standards of the European agricultural model, which is very different from the way of life in the Romanian villages. At the time being, the Romanian agriculture is defined by the European experts as an activity performed by the elder with medium studies or trough subsistence farms, without future perspectives, with low income which lead to a huge gap between rural Romania and the rest of the EU countries. Agro tourism will have much to gain because of the fact that Romanian agriculture is supported in her development by the common agricultural politics.

Through the efforts of the central and local au-

thorities, of the local entrepreneurs, the rural tourism will develop and will have strong implications in the stabilizing of the rural population, through the improvement of the quality of life in the rural areas and trough the diversification of the rural economy, at the same time representing an alternative to the higher demand in the known touristic areas. Therefore, the touristic village could become a “touristic product” as a brand for the Romanian tourism. The rural tourism will depend on an image or a set of images shaped by history, geography and local culture. Hence the local tourism may become an example of rediscovering the places.

IV. CASE STUDY – COMUNA MĂNĂȘTIUR

This article is based on today’s architecture of the Romanian village, and it’s problematic, with a case-study on Manastiur in the Timis county, a region with approximately 1600 inhabitants, located in Faget area and surrounded by natural landscape.

Dating from the XV century, disposed of a high ethnographic potential. The region includes the following villages : Mănăștiur, Pădurani, Remetea Luncă and Topla with a total area of 4.186 ha.

In the latest period this region has recorded a demographic decline, the young population heading towards the nearby cities, and the inhabitants that are left have poorly conditions of life, considering the qualities of the natural landscape at their disposal.

A. General Data –present condition

Located in the eastern part of the Timis county, it is situated at cca.72 km from the city of Timisoara and cca.25 km from the city of Lugoj, accessible from the DN 6 road Timișoara – Lugoj and DN 68 A Lugoj- Traian-Vuia and DC 119. The region is bordering at the north-west with Ohaba Lungă, at the east with Bethausen, at the south-east with Dumbrava and at east with the city Făget.

Because of the unfavourable position to the road that links the cities Lugoj and Faget, an important road at the Timis county, Manastiur hasn’t been able to take advantage of a direct link with the national road which would have offered many opportunities. Thereby the economical and demographic development are running in a slow pace.

In the meantime, the access is favoured by the construction of the Timisoara-Lugoj highway.

Fig. 1. Map of Comuna Mănăștiur 1996

The territory stretches on the sub hilly line of Timis plain. The relief is included in the Beghei alluvial plane, which spreads, in the form of a narrow ribbon along the river Bega oriented from the east to the west.

The territory is passed by the railway Timișoara – Ilia – Lugoj, which has a train station in Mănăștiur village, with is used for commercial and passenger use. The train station has a global interest for all the four villages in the region.

Mănăștiur Village is attested in 1427 and has been mentioned in the Hunedoara county in 1453, in the Timis county in 1519, in the Faget district 1700, in the Bulci district in 1779. At the time being Mănăștiur village is located in the Timis county, and it has 1149 inhabitants

Remetea Luncă Village is attested in 1514. In the present Remetea Luncă village is located in the Timis county and it has 397 inhabitants.

Fig. 2. Map of Mănăștiur Village 1996

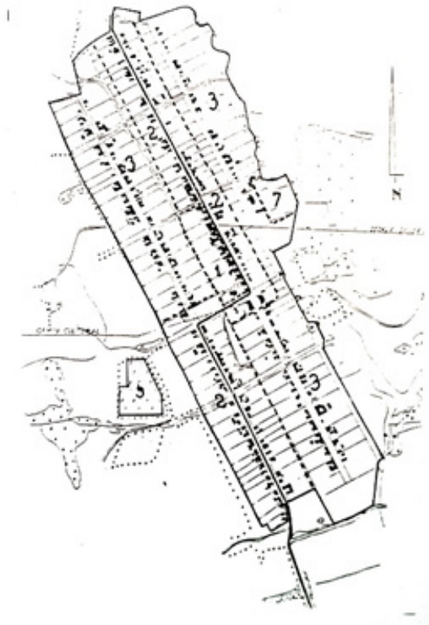

Fig. 3. Map of Remetea Luncă Village 1996

Pădurani Village is attested in 1514. In the present Padurani village is located in the Timis county and it has 86 inhabitants.

Fig. 4. Map of Pădurani Village 1996

Topla Village is attested in 1514. In the present Topla village is located in the Timis county and it has 3 inhabitants.

Fig. 5 Map of Topla Village 1996

B. The current development strategy of the region

The development strategy of Mănăștiur is based on socio-economical and participatory development, regarding the rise of the way of life of its inhabitants.

The directions, objectives and primary measures of Mănăștiur's development are found in the objectives and strategic measures of the Timis county and those of the micro region from where it belongs, meant to lead to the achievement of the strategic objective on long and short term.

These are:

• revival of the rural space and the promotion of a performant agriculture wich can be realised trough intensive and extensive land exploitation, stimulating the agricultural branches ;

• the industry development, trough the increase of productivity of the industrial sector, development of small and medium enterprises, as a base sector for the economical growth, trough the stimulation of the formation and development of productive IMM ;

• the development of tourism trough harness of the existing potential, improvement of the touristic services and orienting these towards the needs of their clients ;

• the development of the services sector trough the increase of their diversification and procentage, trough improvement of the public services as well as trough development of specialized structures directed on the appeal of new investors.

The objectives corresponding to the main directions of development are:

• protection, conservation and improvement of the cultural and historic heritage

• modernization and development of the fizical infrastructure

• development of the business infrastructure, by creating a favorable environment to the foundation of new enterprises

• divesity of the educational system linked to the tendencies of the modern market

• improvement and adjusting the level of qualification- requalification in the labour field

• improvement of work and health conditions as support for economical development

• improvement of the economical value of agriculture, trough creating a system favorable to the rise of productivity

• protecting the rural space, as an ecological life space and the stimulation of the ecological agricultural production and the conservation of the social structures characteristic to the rural life

• consolidation of the economical base of tourism trough the improvement of the quality infrastructure of touristic services

• creating new workplaces and preparing the work force for higher quality of the services

• stimulating a private initiative in tourism and creating a support for sustaining the local tourism

• stimulating the tourism in conditions that protect the environment

The main directions are:

• economical development, trough the development of the supprort infrastructure of economic activities, environment infrastructure, infrastructure of institutional cooperation and the ability of accessing funding programs

• reabilitation and expansion of the infrastructure network in the rural areas

• protetion and responsible management of the natural resources and local heritage

V. CONCLUSIONS

Although we are aware that the rural space will not chance drastically in a short period of time, especially because of the community reluctance to change, and the lack of interest of local authorities regarding the attempt to change the vision about the development of rural area, this study is attempting to drawn the attention over the actual problems and to present the opportunities that should be taken in account in a complex sustainable development system.

Especially through the efforts of the central and local authorities, of rural entrepreneurs and the locals, the economy in the rural areas will increase and will stabilize the rural population, improving the quality of life.

The encouragement of an ecological and sustainable agriculture and the development of an economy based on ecotourism, as well as preservation and promotion of local traditions, could transform the rural space on the verge of extinction in an autonomous environment, at a European standard.

ACKNOWLEDGMENTS

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Enveloping (Wrapping) public spaces in multi-ergonomic structures

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ABSTRACT
The goal of this article is to study and explore the public spaces, with regards to possible meanings and functionality,in relation to the environment in which they live.The study is purely based on existing examples and the analysis of their historic evolution and transformations.The key goal is to reach a pertinent conclusion over how to „cover" them in multi-ergonomic structures in order to increase their social and esthetic performance.The exercise will highlight the role of these „structures",especially in terms of their relationships with users,increasing their possible functional extents;the positive and direct interaction.

Keywords: structure,organism,ergonomic,atractors.

I. INTRODUCTION

Wrapping public spaces in multi-ergonomic structures: Ergonomics –n. a science that studies the relationships between man, machine and work environment (Dictionary of neologisms) Purpose– must respond to questions such as: „why? what? how?".

I think architecture, as well as design and other forms of manifestations related to this field, has a direct psychological impact on people, on the population that comes in contact with them. It has an impact on how they interact, socialize with the architectural „objects" or „object" up to a subconscious level. The person makes contact primarily at a visual and tactile level. „A particular exchange of substances occurs in the experience of architecture: you give the space some of your emotions and thoughts and the space gives you a part of its aura, luring your senses and freeing your mind" [1]. Architects and designers operate the space using a formal language which is decoded by the receptor through the following means of perception: Kinesthetic, Olfactory, Tactile, Auditory and Visual. [2]. As the public space is for everybody, „open" to anyone, it must function cooperatively with the receptor, making it necessary to have „organisms" or „mechanisms" to highlight its use. The multi-ergonomic structure is either an „organism" or a „mechanism" that will cooperate in a better harmony with the subject. I'm proposing a structure: „the structure", which will offer fluidity to the space and logic of its use („why?"), where the public opinion will be taken into account, having direct and indirect beneficiaries. Through the simple analysis of the studied field, taking into account the qualities that the public space offers and could offer, the exploitation of the site in a beneficial way, developed based on the analysis of the existing parameters: location, fluxes, - functions, attractors, light, green spaces, etc.; but also by creating new attractors and new parameters in the analysis of the space, which will lead to a better functioning. The need to bring a plus to the site, the exploitation of the existing attractors, as well as the creation of new attractors („how?") by creating a path towards that POINT (attractor), increases the quality and the use of that space by further activating it. These public spaces (squares, streets, parks, paths) present a temporal evolution, due to the growth of the population, to the development of the city, they become simple passage sites, as well as a constant exchange of fluxes; thus, they will not function as they were originally designed (Piața Unirii, Piața Victoriei, Piața Libertății), but need improvements and lift-ups that will help them „receive" more people and in a different way. An example would be the transformation of passage spaces in areas of interest, by creating attractors in those areas. The outcome of the workshop „Locusts in Ether 2", August 2013, a parametric design workshop, using modeling instruments: rhino and grasshopper, the transformation of a path into an attractor, a point of interest, modeling the access apparatus towards the interior yard. Conceived initially as a temporary installation, it became a more or less „definitive", due to its affects, solving a path in a well-defined public space as an urban insertion

„Increase communication and interaction between users, plus clear separation between public/semi-public/private spaces" [3], evened up at urban scale, rules: addition and repetition. Receiving an „object" that will improve the functional quality of the site by: ASPECT / FORM/ LOCATION/ RELATIONSHIP (with the surrounding architectural space, the relationship with people). ASPECT - „beauty", „Beauty is in the eyes of the beholder" [4], the aspect-beauty consists in human sensations, perception, opinion, state of mind, being subjective.

Fig. 1. Proposal Workshop „Lăcuste în Eter 2"

„The dialogue with the issue of our time" [5], a good outcome is defined by the functionality of the object, its aspect, the relationship with other architectural works and its place – these factors define the purpose of that object, that is the wrapping of spaces in multi-ergonomic structures.
„Design has once again become invention." [6].

II. EVOLUTION/HISTORY/PUBLIC SPACES/KINETIC STRUCTURES

The evolution and the history of public spaces throughout the time, by comparative illustration of their use and requirements, from the first architectural „manifestation" forms, their purpose and use. Antiquity: Agora - Forum agora - n. Public square in the cities of ancient Greece, where the major institutions were located and where public meetings were held; ext. p. the people assembly that was held in this square, civic life and trade – From fr. Agora. (Dicționarul explicativ al limbii române) Athena, the big popular assemblies and counsels were held in this square, a multidisciplinary and active place that concentrated the most important activities of that period. The urban planning for the development of Greek cities included the rearrangement of public squares (agora), their extensions and embellishment with porticoes and shops, which resulted in the creation of attractors.
Forum romanum, a rectangular urban ensemble, with a colonnade, as the main attractor, with different architectural ensembles around it, represents different functions, temples, basilicas, libraries, which became a second set of the square's attractors. The complex Traian's Forum had 280 meters in length and 200 meters in width, consisting of 2 squares, separated by an ensemble of constructions, one of the squares was surrounded by a portico and had on the sides 2 semicircular exedras, public places with seating and relaxation places. The link between the two consisted of a basilica (Ulpia basilica), a secondary attractor, two libraries, tertiary attractors, and Traian's Column, the main attractor.
Middle Age, the medieval public space or the contact space, where the circulation paths are almost exclusively pedestrian, narrow, following irregular routes involving lack of visibility at distance.
Renaissance, the era of developing new urban principles, development of perspective, of Cultural Revolution, reintroduction of the Antiquity principles, new design methods, the Renaissance Revolution resulted in a regulated and esthetic urban space, compared to the medieval one. The straight streets and the drawing of orthogonal plans are specific to the Renaissance -The period of European colonization in the world.
During the Baroque, the important aspects in organizing the city, the urbanism, which results in public spaces, are: the ceremonial street axis (Champs Elysees, Paris), linear street, statues, commemorative columns (Place Vendome, Paris), triumphal arches, landmark monuments (Place de la Concorde, Paris), perspective (Schonbrunn, Vienna), variety by unity.
Industrial city: the problem of population growth, breaking down of rural and traditional environment, the introduction of the industrial age, which changed the urban modeling. The public space becomes a transit space, a traffic space, many of the public squares become intersections, many of the central statues or fountains become inaccessible to the pedestrians and the streets are expanded to obtain a bigger traffic space for the cars, which led to the contracting of the pedestrian space, where the urban furniture and the green space alignment were abandoned. Those things are present and still have an impact in current times. An example of this is London, where the industrial age is still reflected in the absence of public spaces, Piccadilly Circus, Oxford Circus.

Fig.2. Piccadilly Circus 1900

The industrial cities have as a result in the 20th century the development of plans for Utopic cities, which are unsuccessful, through the manifest of the futurist architecture, with proposals of a „city" dominated by tall building, oversized communication ways both for cars and for railways, this being the reason for which all the plans provide for a public space for cars, not for people.
In contrast, on the other side, America was booming, the construction of the big cities is made by orthogonal principles, taken from Renaissance ideas during the European colonization of the world. City principles for cities such as Philadelphia and New York, which register an urban construction and development boom between 1800 and 1900. As a dense city, the public space is located at the street level, to the interior of the buildings' ground floor.

Fig.3. New York grid

Modernism, Le Corbusier and Voisin plan,1925, the project suggests 18 towers of 230 meters, which would have replaced a part of historical Paris, the plan would have had as a result the improvement of the traffic spaces and would have provided for free open public spaces. But the concept would have generated too large public spaces, without specific functions, that would not have functioned
Postmodernism, for a change, suggested the reintroduction of values at a different scale, coming back to a human scale public space, which encourages contact between people, generating contact public spaces, the urban regeneration of the former abandoned industrial areas, i.e. Rem Koolhas, Almere city (near Amsterdam), central area.

Fig.4. Plan Voisin

The old historical centers become thus active public areas, which offsets the activity from their periphery. Public spaces from the historic area become thus pedestrian (example Timisoara) multidisciplinary areas, fixed and defined by the existing attractors and by other suggested attractors.
Kinetic installations - History, Nicolas Schoeffer, September 6 1912- January 8,1992, is considered the father of kinetic art, his years of activity and glory in the world of art took place in Paris. He was one of the authentic innovators in the artistic world, in theory and in practice, in regards to „cybernetic" structures. Active since the 30's, he developed multiple theories concerning dynamism, namely the theory of space-dynamism (1948), light-dynamism (1957), as well as chromo-dynamism (1959).

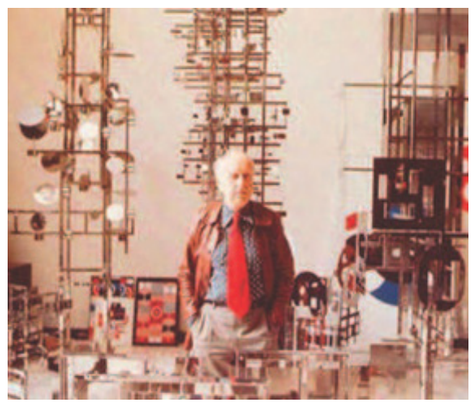

Fig.5. Nicolas Schoeffer's workshop atelier

His first official dynamic sculpture, CYSP 1 in 1956. His cybernetic and dynamic structures are considered constructions at the edge of science, art, electronics, mathematics, always alternating in the different physical aspects of the works. CYSP 1 = Cybernetic spatial dynamic, his first dynamic sculpture, built integrally of steel and duralumin.
Alexander Calder (b. 22 iulie 1898, Lawnton, Pennsyl- vania - d. November 11, 1976, New York) was an American sculptor and artist. He invented mobile sculpture. We created a kinetic sculpture with a certain delicacy, well balanced, nicely and harmoniously proportioned, the movement and functioning was activated by an engine or by an air flow.
Calder's static sculptures, named also as stationary sculptures. But he also produced a very big number of figurines of wires and threads for a miniature circus, called Calder Circus.

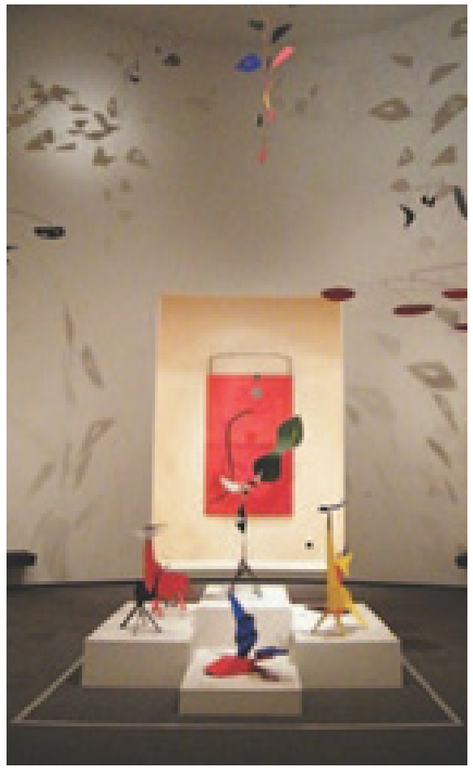

Fig.6. National Gallery D.C

III. STUDIED EXAMPLES AND CONCLUSIONS

From the previous historic and evolutional conclusions, we extracted some more or less contemporary examples where public space is treated and resolved „correspondingly".
The University in Stuttgart built another bionic pavilion within their study. The project is part of an ampler research study in the construction of structures, which reveals the potential in new design, process and manufacturing simulation in architecture. The main aspect of the project was a research parallel between the design strategy of composing the structure, mixed with biometricism, investigations on materials, composite structure of natural fibers and developing robotics for manufacturing methods with polymeric structures reinforced with fibers.

Fig.7. ICD(Institute for computational design) research design

Also in the University of Stuttgart, ICD, a study for making a kinetic, interactive and responsive structure, which changes shape in contact with water and humidity. Image 8 represents 3 samples of composite veneer, 1 mm thick, programmed to respond differently to different degrees of curving, in different conditions of humidity, with an increase and a decrease of humidity.
Ulterior developments „Hygro Skin" (the responsive pavilion made of composite veneer), results in a responsive, kinetic and interactive design.

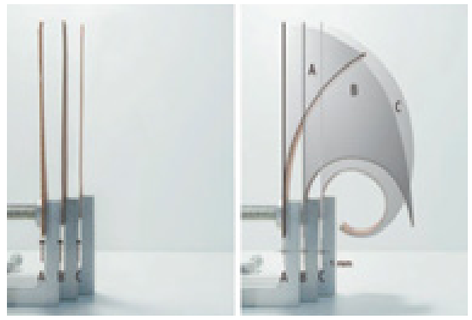

Fig.8. ICD (Institute for computational design) research design

Fig.9. Study result

Zaha Hadid Architects, composite kinetic structures and installations. „Chandelier" for Swarovski Crystal Palace. Swarovski Crystal Palace is a collaborative project which has become a favorite exercise for design conventions, in its 8th year as kinetic interactive pavilion display.
Made of Swarovski crystals, aluminum, stainless steel, copper wires and Led microprints, this illuminated installation seeks to transform the structure's movement through light, by exploiting the circulation. "Drawing inspiration from self-organizing systems and nanotechnology, the project redefines the chandelier, transforming it from passive object merely hung from the ceiling to a reflective light source that forcefully engages with the space." [7].
"The Zaha Hadid Chandelier turns Swarovski crystals into luminous particles in a kinetic web seemingly spun by geometricist extraterrestrials." [8].

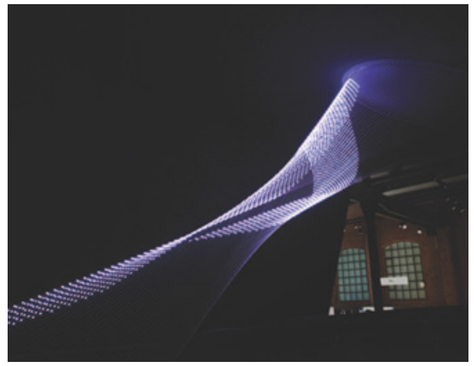

Fig.10. Chandelier

Zaha Hadid Architects „Parametric Space" kinetic interactive installation made in partnership with the design company Kollision, research studio CAVI, motion designers Wahlberg, opened in 2013 a creative installation named „Parametric Space", with light funnels that penetrate downwards through a malleable elastic ceiling.
The design would have been sufficiently interesting if it only presented a lighting spatial composition, but in the reality of the process, the „funnels" execute vertical moves up-down, depending on the guest's proximity. Thus, this structure offers a direct interaction, creating movements that take after the person that interacts with it. And the light has a dynamic projection, adding another layer of interaction to the space.

Fig.11. Parametric Space

IV. STUDY

Developing such a kinetic, transitory structure within my study site, Modatim, „City Business Center”. This multi-ergonomic structure has as purpose the regeneration of the space in which it will „live”, taking into account the existing paths, the functions and the functionalities of the space, fluxes, traffic, exterior and interior public spaces, as well as semi-public and private spaces. The complex consists of 5 buildings (the 5th is in the final stage of construction), meant for office areas and not only, a main gallery that symbolizes the central axis, the atrium, etc, forming a modular construction similar to a small city. In each building the ground floor and the mezzanine are intended for retail spaces, service spaces and other public areas, together with the superior floor and the terrace for restaurants.

The insertion of a structure maintains the area active throughout the entire day, an area that is intended both for „residents” of the City Business Centre, as well as for the „visitors”, seeing that in the area there are other office complexes, schools, a market, hospitals, living areas and other functions. As the area is perfectly active, it needs such a structure that can contain recreation areas, seating areas, „shelter”, lighting, space with exhibit area, etc.

Such an organism will improve the functional quality of the space by: form, aspect, relationship (with the complex, the people, other objects), location. Structure intended for creating a „tension” between outside-inside / public-private / thresholds, transitions and borders. Multi-disciplinary attraction point or attractor of the place. „My creations are bodies and need to be built accordingly.”- „I create room - space - and place.” [10]

The dialog consists in the relationship with the place: „The dialogue within the issue of our time” [11], in which a fourth dimension in architecture and design is time, space traffic. The studied public space is in a stage of transit space, traffic space and a simple exchange of people fluxes, thus, such an intervention would be necessary to reanimate the „scenery”.

Fig.11. Modatim’s exterior

Fig.12. Modatim’s exterior

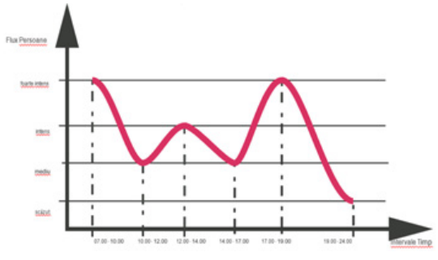

Fig.13. Diagram of fluxes by time intervals

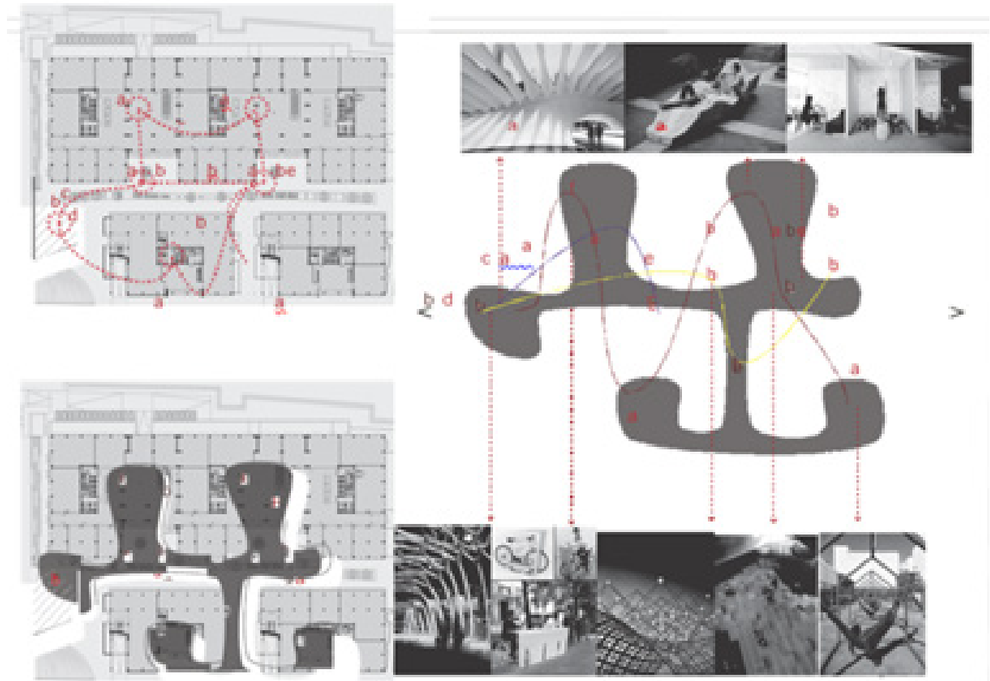

Fig.14. Diagram of public spaces -connections-needs

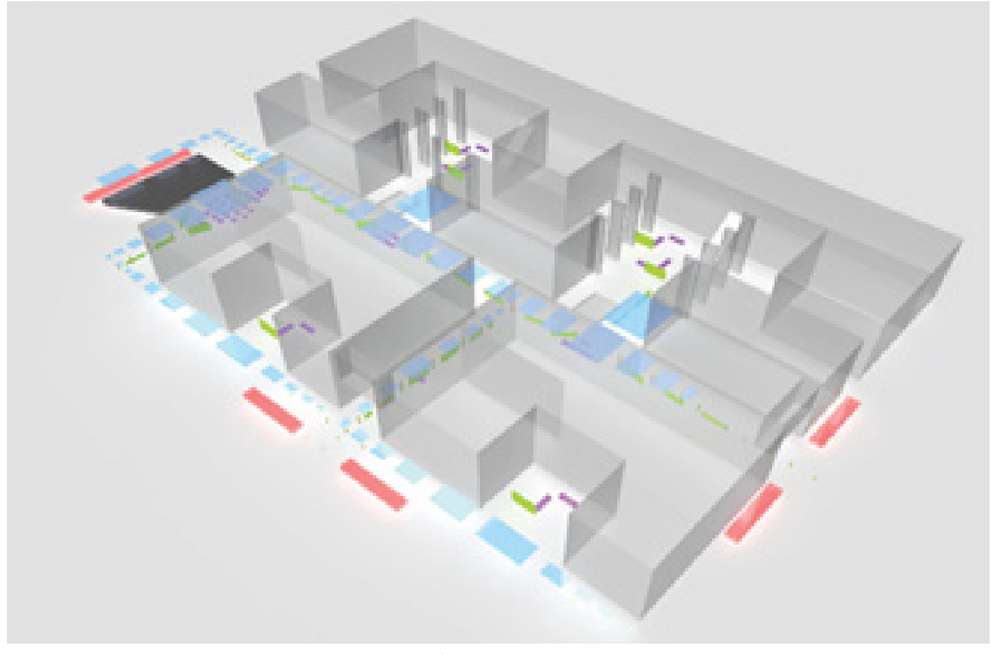

Fig.15. Diagram of public spaces occupation/proposal

V. CONCLUSIONS

Such interventions can activate the constructed space and the constructed environments, by accentuating a function, activating different functions or generating new, additional, adjacent functions, which reactivate that space.

This would bring an added benefit to the space for which it is proposed, this structure becoming thus a new attractor, beside the existing ones, it would attract more people, being a means of „manipulating" that space. First and foremost I create new attractors, to make the connections between the buildings stronger,but not only, I absorb the existing attractors and improve the existing connections through my OBJECT, via a better fluidization and harmonization of the space.

My structure improves the quality of the space, by refunctionalizing it,by not letting it become just an exchange of fluxes, as in the congested example of Picadilly Circus,but by bringing it to life, by animating it in one way or another with the help of the multi-ergonomic structure. It will contain seating places, shelters, places for eating,relaxation spaces, more „private" or more public areas, creating a certain tension between them, the site will become of interest, beside the fact that there will be illuminated paths, areas for parking the bicycles, the strict minimum that presents a major interest to this site and this intensely studied area.

Thus, the insertion of my structure can maintain this area active for a longer period of time (undetermined) throughout the day, and not only during the opening hours and the activities of the building, as illustrated in the above diagram, as the full exploitation of this structure could illustrate an more intense activity in that area, as well as in the evenings, through different socio-cultural activities, exhibits, conferences, meetings, etc.

It is important to know that the structure will not have only a static side, but will contain a larger palette of interactive exercises between the „objects" that compose it, or the elements that define it, in addition a much more interactive side will be the one defined by the kinetics, by movement, sounds, light and different direct interactions with the interlocutor.

In my opinion, The Structure can only improve the public space that is not used appropriately and is just left to chance, not just by creating comfort zones for those who use it, but also from the point of view of the social interaction between people, through its impact at psychological level, in a beneficial way, through simple artifices, for example the guiding in that space or the guiding towards areas of interest or important areas in the complex,towards areas with maximum potential:such as the Lock within City Business Centre. The fluidization would offer a clearer orientation in the weave. In this case, the function will inform the shape and, at the same time, the shape signifies function.

The goal of this article is to study and explore the public spaces, with regards to possible meanings and functionality, in relation to the environment in which they live, how they are designed. The study is purely based on existing examples and the analysis of their historic evolution and transformations over time. The key goal is to reach a pertinent conclusion over how to „cover" them in multi-ergonomic structures in order to increase their social and esthetic performance. The exercise will highlight the role of these „structures", especially in terms of their relationships with users – „dressing" them up, increasing their possible functional extents; the positive and direct interaction creating an open „relationship" between user and object. The grounds of the study are based on, introducing „the Structure" in certain public spaces by creating new attractors that will increase the "communication" and interaction. The Structure will bring a new dynamic and edgy function to the chosen public space, namely by fluidity and by creating attractors, not only by making new connections, but by strengthening their existing ones through this its capacity to guide and orient.

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Libertății Square in Timişoara – Historic Evolution and Current Issues

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ABSTRACT
History of Libertăţii Square, development and importance over time. Obvious artistic composition based on the landscaping composition, with the goal of emphasizing buildings. The Square's redevelopment and archaeological discoveries, their inestimable value and the care of local authorities. Urbanism solution.

Keywords: Libertăţii Square, St. Mary and John of Nepomuk Monument, Architecture of the Square and Buildings, Turkish Bath

I. INTRODUCTION

The first fortification in the current Cetate Quarter in Timişoara was built in the twelfth century. This was also the original nucleus from which the present-day city started developing.
An important starting point in its development was the construction of the castle by the Hungarian king Charles Robert of Anjou between 1307 and 1315. The current Hunyadi Castle, which nowadays houses the Banat Museum, was built over this old castle. "The Cetate Quarter has always been the "heart", the cultural, administrative and political centre of the entire city." [1]
Three urban squares were designed in the historical centre of Timişoara. Each square has different sizes, aspects and architectural styles. Libertăţii Square is a link between the other two, namely Unirii Square and Victoriei Square.

II. GENERAL INFORMATION

Libertăţii Square is undoubtedly the oldest of the Timişoara squares, as old as the medieval fortress, even if, in time, it has undergone many transformations. It had several names in the past, such as the Parade Square or Prince Eugene Square, as it housed from the start several buildings with military functions.
It received the designation of Parade Square as ceremonies and pomp were highly relished at that time; suited to the Baroque spirit of the era, the square became the citadel's festive parade area, whether military or religious. (Fig. 1)

Fig. 1. Ceremony in Libertăţii Square – posted on 06/24/1910

The name of Libertăţii Square appears in 1848-1849 with the outbreak of the Hungarian revolution, but, after the Austrian army retook the city, the square changes its name again to Prince Eugene of Savoy Square (Jenö herceg tér).
In one of the drawings from 1727, in addition to all the buildings that can still be seen today, there is a portion of unbuilt land, much larger than the current square. "According to C. Cionchin, in 1718, the army donated from its funds an area of ca. 400 sqm to the residents of Timişoara, landscaped as a public garden." [2]
The square is limited to the present area, because of the buildings constructed in the late eighteenth century, such as the Garrison Commandant's Office, the former Chancellery of War, the Old City Hall, the Military Casino. The square served as a small 'piazzetta' in front of the City Hall. It was only after 1859, when the current building, also called the 4th Army Corps Commandant's Office, was erected, that the fronts were completely constructed, including the south side of the western front of the square. Following these interventions, Libertăţii Square became "... an urban space enclosed with buildings on all four sides." [3]
According to C. Cionchin, in 1868, deciduous trees were planted in the Square, regularly arranged as an orchard. (Fig. 2) In 1923, during a visit made by King Ferdinand and Queen Marie in Timişoara, the king planted two oak trees in front of the military commander's office; a memorial plaque which now no longer exists was placed beneath them. These oak trees are the only ones who escaped the clearings during the redevelopment works to the square in 2014.

Fig. 2. Trees planted as an orchard – posted on 07/16/1900

The Square has undergone multiple changes in the twentieth century, such as:
- in 1936, the Victory Monument was moved from the Square to the Heroes Cemetery;
- in 1974, the statue of St. Mary and St. John of Nepomuk is returned in front of the former City Hall, where it's original placement was, since 1750 until 1853;
- in 1988, the former tram lines crossing the Square on the diagonal were removed;
- the Square kept its original form until 2014 when redevelopment works began.

The first horse-drawn tram initially connected Traian Square and St. George Square and was commissioned in June 8, 1869. The line was extended to Iosefin, and, in 1871, it connected the city with Gara Mare (Main Railway Station). The route of the horse-drawn tram was different from the one existing nowadays. In 1899, the tram lines were present in the square outside the Traian Square, 700 Square and Ronaţ axis, which exist today. Also there was a tram line linking Victoriei Square with Libertăţii Square traversing Alba Iulia street and bifurcating with the tram line in front of the old City Hall. (Fig. 3)

Fig. 3. Old tram line – posted in 1913

This tram line disappeared after the systematization works of the early '80s. The tram was removed permanently from the centre in 1988. In general, the square serves two main functions: transit and recreation.

III. STYLE AND ARCHITECTURE

The design and composition of the square were evidently based on landscaping. Generally, it has regular, geometric shapes, with flower beds on the double alley which has existed since 1988 on the old route of the tram. Hedgerows also supported the square's regular style. The urban value of the site is correlated to historic buildings and monuments.

A. Garrison Commandant's Office

"In 1727, it already appears in city plans. It is called the "New Generalate". If the building had already been plastered on the inside, this means that the count of Mercy lived here since 1727.
In 1752, at the front, facing the square, it had two floors and an attic apartment. The detailed plans of the time show a house with one floor and an attic. The ground floor housed the kitchen, stables, and the rooms for servants and ordinances. The first floor included living quarters, representation and archive spaces. The attic incorporated living quarters and warehouses.
On the roof, the three bays marking the entry on the ground floor were highlighted by a triangular pediment. This pediment can also be seen in engravings dated after 1853. But the attic no longer existed, maybe as a result of damages incurred during the siege of 1849 or perhaps the roof burned during artillery bombardments.
Photographs from the years 1880 to 1900 no longer display the pediment on the roof. Instead, three arches were built on the ground floor (next to the entry, on its left and right), over which a terrace is built on the first floor. Today, only the arch in the middle, over the entry in the building, is preserved. The other two, on the right and left, were closed.
Originally, the architectural style was Baroque. The façade on Alba Iulia Street still retain some Baroque elements in some window frames. [4]

B. The Old City Hall

"The Old City Hall building is located in Libertăţii Square no. 1, and was built between 1731 and 1734, after the Austrians conquered Timişoara, a time when German settlers established the city demanded authorities to build their own city hall. Thus, the German Community Hall or the New Hall appeared. Over time, the building went through several stages and has undergone various changes:
- in 1781, it was called the City Hall of the Royal Free Town of Timişoara;
- in 1782, it was rebuilt by Josef Aigner, the emblem on the façade also changing;
- in 1849, the building was damaged during the revolution by artillery bombardment;
- during 1848-1849, the Austrian commander of the fortress, Rukavina von Vidovgrad, installed two loaded cannons in front of the City Hall to intimidate the revolutionaries;
- the project for the new façade dates from 1853. [5]

The façade of the building has an Eclectic style, with classic elements specific to the mid nineteenth century. The building consists of a ground floor and two storeys. Above the gate there is a balcony and four arched windows.

C. The Military Casino

"The Military Casino is located in Libertăţii Square, being the most valuable military building dating from the eighteenth century. In 1752, it was called the Commander's House. The construction works were completed in ca. 1775. In time, another storey was added to the building which was also completed with a large terrace. In a refined setting, officers' balls, famous at that time, took place in the large festive hall of the Military Casino. This highlights the important role the building has played in the social life of young Timişoara inhabitants of those days. [6]

D. Statue of St. Mary and St. John of Nepomuk

The monument was erected in 1750. It was made of sandstone by Viennese sculptors Blim and Wasserburger in the Rococo style. The monument is very valuable, and was commissioned by the Catholic Society of St. John of Nepomuk in memory of the victims of the plague of 1738-1739.

E. The Victory Monument

Following the battle of August 9, 1849, in memory of the heroes of the siege of Timişoara which lasted 107 days, a monument was built, the unveiling taking place on January 17, 1853 in Libertăţii Square. The monument was designed and executed by architect Joseph Kranner. During the revolution of 1918, the monument was damaged and in 1936 it was moved to the Heroes Cemetery, where it can be found today.

IV. ARCHAEOLOGICAL DISCOVERIES AND EXPLOITATION PROPOSALS

The Turkish Bath placed in front of PNŢCD headquarters, discovered during the square's restoration, remains one of the most important archaeological discoveries ever made in Timişoara.
"There are no other spectacular discoveries made in Libertăţii Square. We focused on the stratigraphic analysis of the Turkish Bath and adjacent buildings to date them accurately. In this regard, we have opened several sections, up to about 3 m deep, down to the sterile layer. Some of the discovered structures are even older than the Turkish Baths; they predate 1552." said Dorel Micle, PhD. [7] Archaeologists found in the Turkish Baths in Libertăţii Square "a floor heating system of the hypocaustum type, following the Roman model taken over through the Byzantine influence by the entire Ottoman world. It was basically a room built of stone and bricks attached with clay, in which a wood fire was made at ground level and the heat was transported through four vaulted channels to all rooms of the bath. Three of these vaults were found, extraordinarily well preserved in time, the fourth having been destroyed by subsequent interventions.", said Archaeologist Mariana Balaci. [8]
"The hypocaustum is a Greco-Roman underfloor heating system, originally developed in thermae, but also in large Roman villas. The term comes from Greek and means "to heat from below". In this system, the room where the heat was produced was outside the building, and hot air arrived via directed channels in the empty spaces of floors of these buildings. The walls were designed with exhaust channels through which cold air was directed upwards." [9]
"The succession of rooms in the Turkish Bath was designed in relation to the distance from the hot room. People went into locker-type room where they undressed, and successively passed through several rooms to saunas and baths to the hot room, which was closest to the heating system; the room had a hexagonal marble table in the middle, probably used for massages, fragments of which being found. When the heating system in Libertăţii Square Turkish Baths was exposed, the room's flooring was still covered by about 7 centimeters of ash and soot from the last fire." [10]
According to the project, in the rehabilitation of

the Libertăţii Square, the pavement is decorated with concentric circles around the Statue of St. Mary and St. John of Nepomuk. The square is paved with cobblestone and red bricks. (Fig. 4) According to the statement made by Timişoara City Hall spokeswoman Alina Pintilie, we obtained some information about the materials used in paving.

"The paving of streets and squares in the historical centre will use andesite cobblestones from Romania, sized 6x6x6 cm, 10x10x10 cm and 12x12x12 cm, Red Porphyry cobblestones from Italy, sized 12x12x12 cm, Red Porphyry tiles, sized 60x60x8 cm, and Wienerberger clinker from Austria. The total paved area will be 40,000 sqm, of which approximately 25% imported natural stone paving, and 75% natural stone paving from Romania." [11]

Fig. 4. Pavement used in the rehabilitation of the Square

Following the archaeological discoveries, the project is slightly changed to include the archaeological remains. The area around the discovered walls will comply with the proposed project. Meaning, it will still have a circular shape. Once the walls are treated to resist weather conditions, the discoveries will be exhibited in the open.

During the rehabilitation, trees were cut down one by one. After the rehabilitation, only three trees remain, the two oak trees in front of the Military Commandment's Office planted by King Ferdinand and Queen Marie, and a plane tree on the left side of the Military Casino. More recently, another plane tree was planted on the other side of the Casino.

According to Mayor Nicolae Robu, the square will be used to host various events and exhibitions. "A city like Timişoara needs a cultural and artistic pulsation in the open and this must happen in squares. There will be a number of trees, so as to best fit without distorting and disturbing our goals for Libertăţii Square. Musical performances will happen there every day (...), there will be cartoonists, painters and so on. That should happen in a square. It mustn't be a dead square in terms of activities ..." [12]

V. THE URBANISM SOLUTION

The proposed project for this work is purely theoretical. (Fig. 5) The proposal made in this study kept the old elements build which could be saved, the centre of interest being the Statue of St. Mary and John of Nepomuk. The delimitation of the monument from the alleyways is achieved through a pool of water, that existed before as well.

Fig. 5. Top view of the proposed project

Green spaces preserve to a certain extent the percentage of previous vegetation, the novelty being in the form and volume created, by proposing a parapet with sitting places around the curbs planted with grass and trees. Some green areas received a multiple function by installing vertical concrete walls, providing stability, and also sitting places.

The position of each luminaire is marked by changing the pavement to raindrop shapes. (Fig. 6) For archaeological excavations, the solution found is building the sidewalls of space discovered with brick and installing a glass floor on a steel beam system in the pavement. The space and form created is intended to protect the vestiges against the weather, throughout the four seasons.

Fig. 6. Perspective

To highlight the discovery, we proposed a historic information pane made of metal, and engraved with the emblem of the former fortress. The entire ensemble built incorporates lighting at night.

For the square's delineation, we proposed marking with metal bollards. The project presented in this study suggests a new variation for the paving material.

The colors and textures of materials were chosen according to the colors of buildings that make up the perimeter.

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Misconceptions of sustainability in urban regeneration projects, case study Câlnicel Neighbourhood Reșița

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ABSTRACT
Numerous urban regeneration projects have tried over the past years to amend the effects of Urban Sprawl with little success. Misconceptions of the sustainability concept prove even more harmful to this initiative. A critical comparative analysis of the key aspects of sustainable urban regeneration and actual project briefs highlight the steps needed to be taken to provide revitalization strategy for Resita City.

Keywords: sustainable urban regeneration, Resita, sustainability.

I. INTRODUCTION

Urban Sprawl type developments are defined as a cities' low density, single function, uncontrolled expansions into the territory and represent the last century's most urgent urban development issue in the United States, Western Europe and emerging countries [1].
The problem consists of its unsustainability and ecologic, economic and social issues it spawns [2].
Thus, the last decades have witnessed a rise in the number of urban regeneration project that try to balance the effects of Urban Sprawl. Taking into consideration that these projects are usually undertaken in relatively central areas, the focus is set on sustainability and high quality of life [3].
However in Romania these projects have not been undertaken for various reasons: inability to create complex management structures that involve local authorities, investors and citizens; the investors' compulsory pursuit for maximum profit; the local authorities' misconceptions on urban regeneration projects.

II. ANALYSIS OF URBAN REGENERATION CONCEPTS

In forming the proposed strategy for Calnicel Neighbourhood, the following urban regeneration concepts were studied:
1. Urban regenerations are vector based structures illustrating the projects' physical characteristics – PHYSICAL PLANNING as opposed to classic territorial units which a normative character,[4]
2. They are run by management structures composed of representatives of all interested parties: investors, local authority, politicians, professionals, citizens and NGO's. Each entity has a vote proportional to its contribution, established during negotiations [5]
3. Generally relatively central urban zones are the subject of urban regeneration projects, former industrial or harbour areas or those that have been abandoned or are lifeless due to economic and social changes [6]
4. Good connectivity between the regenerated area and the rest of the city is crucial and achieved by improving all accessibility infrastructure [7]
5. Urban regenerations' viability require a mixture of functions, residential, commercial, services and workplace areas, and a high density of people to sustain them [8]
6. High quality of life depends both on the mixture of functions and on that of built and public spaces, urban squares, parks, playgrounds, etc. [9]
7. A balanced social mixture of economic, age, occupation, ethnical diversity is key in creating a viable community [10]

To validate these premises the authors' project for Calnicel Neighborhood, awarded at the urban regeneration competition for Calnicel Valley, Resita will be analysed.
The Resita City Hall competition brief asked for the revitalization of a 268.029 sqm area through the insertion of the following functions:
- Low rise single family residential units for young families
- Large scale neighborhood park for the prox. 60.000 inhabitants of the nearby Govandari Neighborhood
- Community center that houses public and private services, culture and commerce amenities

The proposed site is on the city's outskirts, an area covered with a mixture of functions (32,2% low rise residential area, 35,9% farmland, gardens, 24,2% meadow, 6,2% roads and 1,5% services area) (Fig. 1).

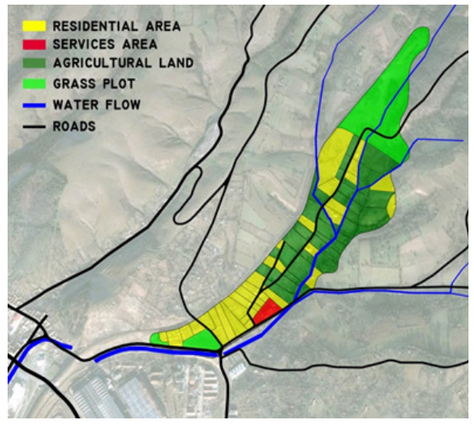

Fig. 1. Current situation of Govandari Neighborhood.

The area's population is characterized by very low incomes and tough living conditions asso-

ciated with subsistence farming. Public space consists of a non-landscaped green area in the south and three undersized, 5 meter wide, unpaved roads with no sidewalks and no street lighting. The residential area lacks public utilities being only connected to the electricity infrastructure.

The site's is bordered to the West by a railway, creating a twofold dysfunction both from the noise pollution perspective and that of the inherent protection area. (Fig 2). All three levels of restriction are breached, housing being as close to the railway as 10 meters as opposed to the 100 meters ban on residential units and 20 meters ban on all interventions, including roads.

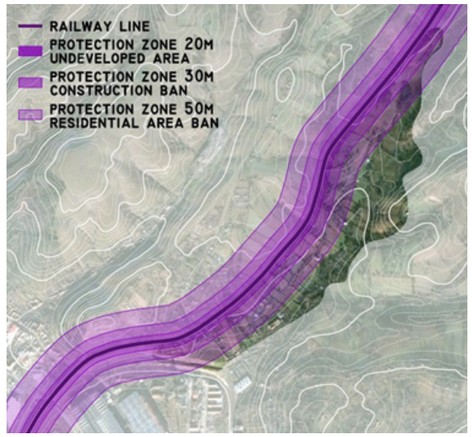

Fig. 2. Railway protection area

The difficulty in complying with the local authorities requirements for the development of the site becomes apparent when one considers that 49.7% of the area has a ban on residential construction while 24,5% on all building construction. Thus a green area is proposed in the railway's proximity, over the all building construction ban area, followed by commerce and services zoning on the remaining 25.2%.

An electricity transformer station borders the site to its South while the area is crisscrossed by power lines, namely a LEA 110 kV with an inherent 75m wide protection area and two LEA 24 kV with 50m ones, (Fig. 3). The approximatively 8% of the site covered by these protection areas are used for agriculture or to house farm animals despite the existing ban. Therefore, to discourage this practice we propose dense low vegetation green areas.

Fig. 3. High voltage line protection zones.

As the entire area is crossed by a non-landscaped creek approximatively 7% of the area is frequently flooded. (Fig. 4) Thus, a minimum of 10m green protection area is proposed to act as a water retention area in case of floods and a park under normal circumstances.

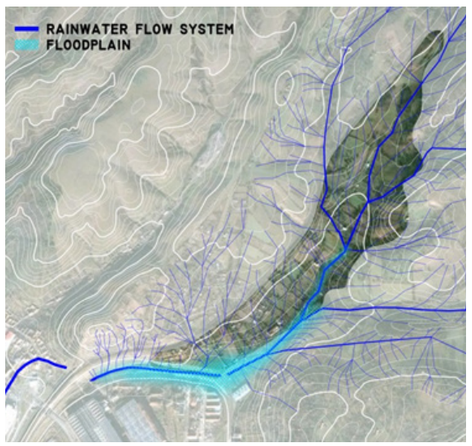

Fig. 4. Freequently flooded area.

The site's slope mostly varies between 6% and 60% but it also includes two areas where it exceeds 80%. (Fig. 5). As the two areas would entail high infrastructure and foundation costs due to their extreme slope they are unsuitable for residential areas. Thus it was proposed to maintain them as wooded green areas to prevent soil erosion.

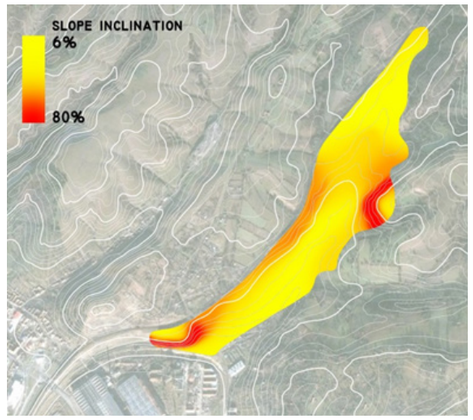

Fig. 5. Land slope.

By superimposing all layers of the analysis (Fig 6) it becomes apparent that 75.3% of the area is not suitable for a residential area considering the overlapping restriction areas or the unsuitable terrain. As a result only 24,7%, namely 66.174sqm of the area can be transformed into a residential area. As approximately 20% of the possible residential area would be taken up by roads or wasted due to the sites geometrical irregularities, a maximum surface of only 19,7% of the area will be viable for residence zoning (Fig 7).

Taking into consideration the legal minimum housing plot of 150sqm the area will be able to house only 352 plots. By cross-referencing these numbers with the Romanian average number of people per household, 2,66, a total number of 938 people could be housed in the area. [11]

A 938 population for a 268.029 ha results in merely a 35ppl/ha density far below the 150-

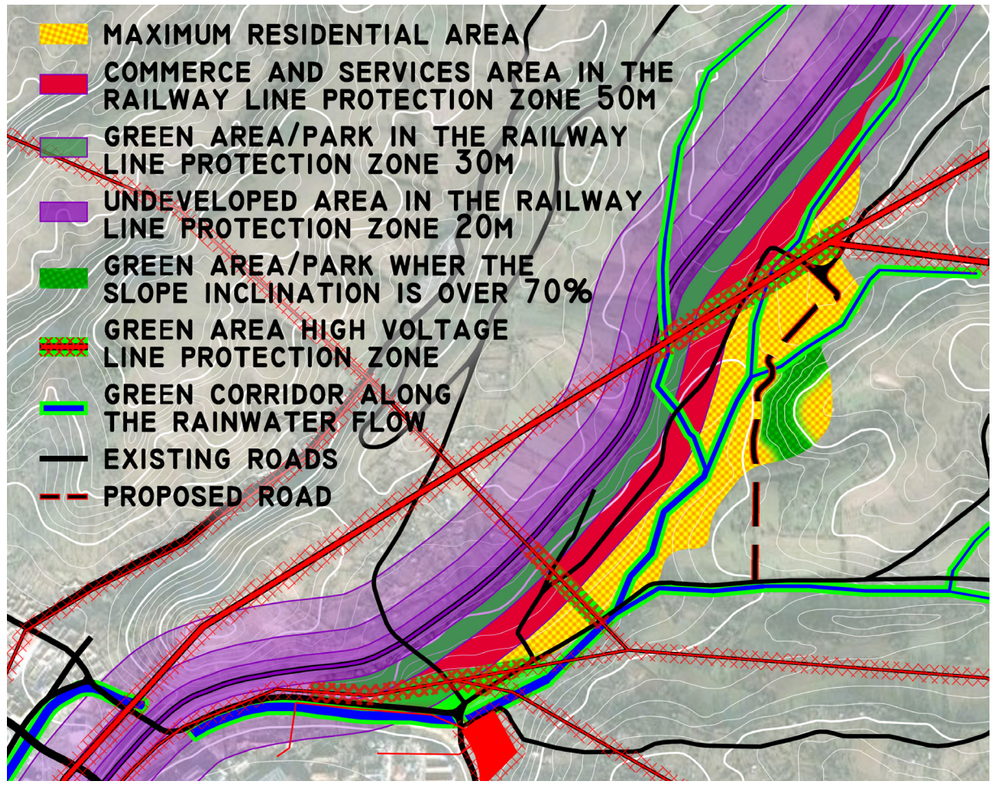

Fig. 6. Current situation showing all protection and interdiction areas.

180 ppl/ha of a sustainable development according to Arbury. [12]

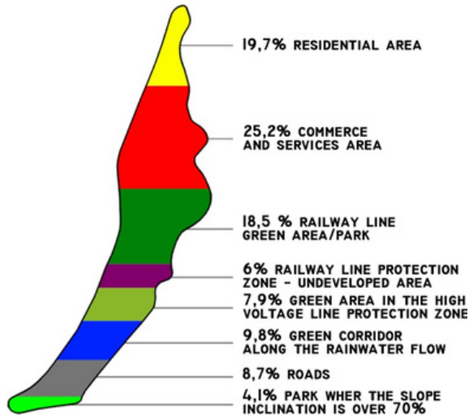

Fig. 7. Different functions area coverage percentages considering protection areas.

The second major feature required by the brief consisted in a park for the nearby densely populated neighbourhood. As a 10 to 30 ha green area's influence radius does not extend 800m, 76% of the future park's radius would not serve any residents due to its location in the city's outskirts, making it an inefficient brief requirement. (Fig. 8) [13]

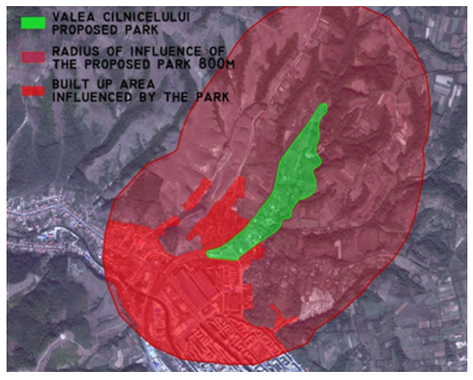

Fig. 8. The proposed park's influence area.

According to C. Alexander numerous smaller green areas are far more efficient to a single larger one as they provide better accessibility and a higher coverage area. [14]

III. URBAN ANALYSIS RESULTS

Comparing the Resita City Hall competition brief requirements to urban regeneration principles based on the results of the urban analysis illustrated the projects feasibility.

1. A physical planning project can be created for the site without impediments
2. As all urban actors have to be involved in the management structure and decision process the brief must take into consideration the opinions of citizens and possible investors besides those of the local authority and experts. Considering that only a small low density residential area can be created and the high infrastructure costs it entails the brief requirement is not financially viable for either the local authority or possible investors.
3. Small scale centrally located areas are best suited for urban regeneration to benefit from the existing infrastructure, strengthen urban centres and stop urban sprawl. The proposed site situated at the city's outskirts does not meet this criterion.
4. While the existing roads infrastructure is underdeveloped the pedestrian and cycling ones are non-existing, necessitating substantial investments. The average 35ppl/ha possible density is well below the minimum 100ppl/ha required to maintain a financially sustainable public transport. [15]
5. The low density would not be able to sustain a mixed use development as well.
6. The much needed public spaces could only be created by occupying the already meagre area suitable for residential plots.
7. The competition brief defines the future inhabitants as young people implying the area's gentrification. The practice of modifying an area's social composition by relocating low income inhabitants from historical or former industrial areas and creating housing units designed for younger people with higher incomes creates social problems. On the one hand the result lacks social mixture while the low income population moves to even more unfavourable areas failing the social criteria of sustainable urban development. [16]

Therefore the brief fails to comply with 5 of the 7 criteria of a sustainable urban development.

IV. URBAN PROPOSAL

In response to the critical comparative analysis of the competition brief and the criteria for sustainable urban development two strategies were developed, namely one for Resita City and a second one for the regeneration of Calnicelului Valley. Between the city's historical centre and its socialist one there are numerous former industrial areas such as the former steel plant or UMC Resita to name just a few, nested between the most densely built neighbourhoods Lunca Pomostului and Govandari. However, an even more appropriate area the local authority could attempt to regenerate would be its very own railroad yard. Location wise the area is situated between the Lunca Pomostului and Govandari neighbourhoods on its North and South borders, the Barza River to the East and the Railroad Museum to the West. It forms a link between the two densest neighbourhoods on one axis and a cultural, museum, and natural, river, interest point on the other. Whichever areas might be selected a public-private partnership must be created to stay at the basis of any decision making process and represent public interests. The central location and accessibility to the roads and utilities infrastructure facilitate the creation of a high density, socially diverse urban development (Fig. 9). Thus all three sustainability piers are achieved.

Taking advantage of the city's development in

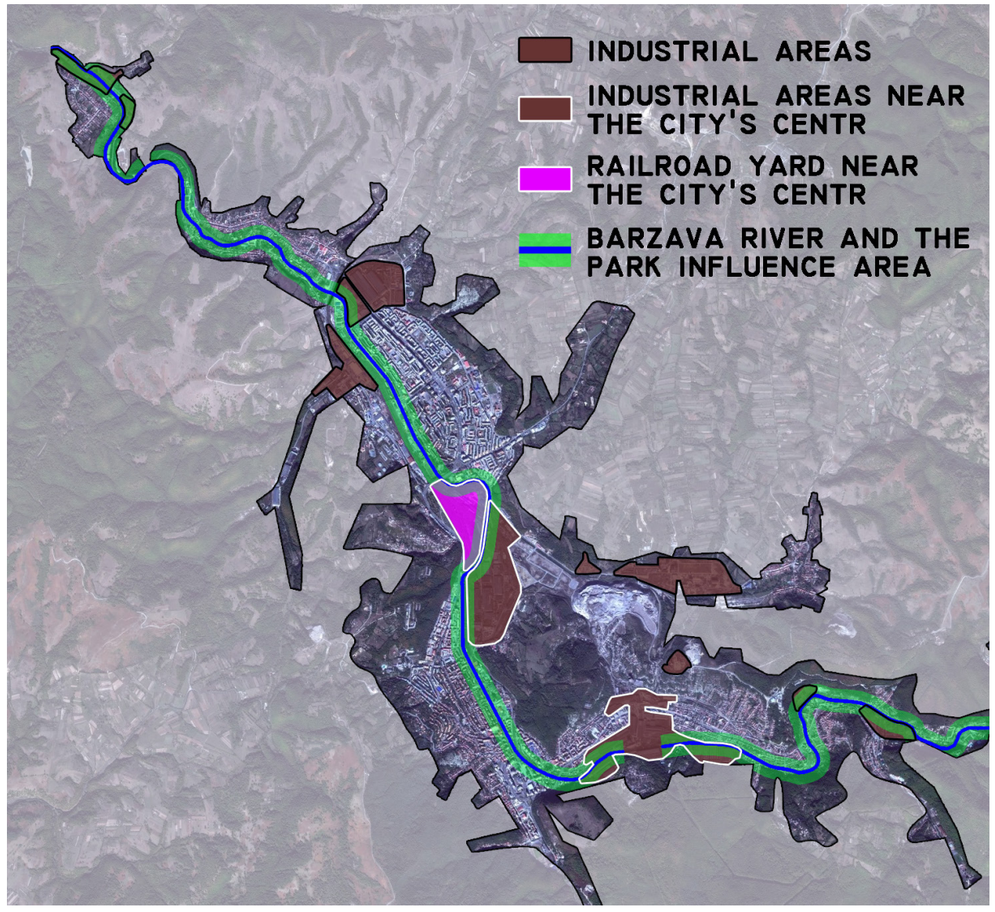

Fig. 9. Proposed areas for urban regeneration.

close relation to the Barzava River, a linear waterfront park is the proposed solution instead of a large scale one in the city's outskirts. All neighbourhoods would be this connected by a green urban axis and its area of influence would reach the majority of built areas. Furthermore this proposal would benefit from the presence of a natural element solidifying its identity.

By transforming the now barrier like Barzava river to the city's green backbone, a place to socialize and connect with nature, all neighbourhoods would be connected and revitalized.

On a local level, for the Calnicel Valley area, local acupuncture like interventions are proposed based on a long term strategy, to kickstart an organic, paced development that would help mitigate its problems.

First to be tackled are the area's major problems: putting an end to the floods and redesigning the area covered by the high voltage electric lines. To prevent floods, a 10 m wide area is proposed along Barzava River's tributaries to create both a water retention area and a linear green area. On the Southern lawn a minimal park can be designed as a designated emergency flood area to spare the residential ones.

The high voltage electrical lines' protection area is proposed to be planted with dense low vegetation to prevent farm animals from grazing or vegetable growing in that area and protect the locals' health at a minimum cost to the local authority.

The road and utilities infrastructure represent midterm objectives in improving the area. To limit costs only a redevelopment of the existing road network is proposed, creating a one way route and adjoining pedestrian path, while connecting the current houses to the utilities infrastructure.

The long term objectives are the most difficult having to deal with solving the noise pollution problem created by the nearby railroad, extending and densifying the residential area and providing it with a mix of commercial facilities. An evergreen vegetation barrier is proposed to stop the noise pollution while providing a nice backdrop. The area identified as suitable for residential zoning is proposed to be designed for higher density to attract the later development of commercial facilities in the area currently occupied by residential units but under the influence of the railroad protection area construction ban.

V. CONCLUSION

Based on the comparative analysis of the key aspects of a sustainable urban planning and the Resita City Hall competition brief requirements, the authors created an alternative long term strategy to revitalize the city by relocating the urban regeneration efforts to a more suitable location. Drawing up a series of acupuncture like interventions to kick-start the city's green backbone through redesigning the Barzava River waterfront the authors focused on public-private based initiatives requiring little effort and limited investments from the local authority. The proposal for Calnicel Neighbourhood takes into consideration all the sites restrictions and steers its development away from the damaging Urban Sprawl trend.

ACKNOWLEDGMENTS

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The potential of inland waterways - Case Study Bega Channel

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ABSTRACT
Current transport patterns are at a turning point. All around the world, an increasing number of companies are looking for innovative transport solutions by waterway – when possible - to save costs and emissions. Climate change, decreasing natural resources and traffic jams all point to the necessity of creating different and more sustainable ways of transport in Europe. On rivers and canals, there are bursts of activities that can happily co-exist. This turns waterways into new roots of economy – enhancing the return on investments. The purpose of this study is to analyze and highlight the potential of channel Bega. Often considered only in terms of its transportation function, the Bega channel also forms a green infrastructure, delivering a wide range of services to society – economic, social and environmental.

Keywords: inland waterway, waterway regeneration, urban strategies, water transportation, Bega Channel.

I. INTRODUCTION

Most watercourses have been made waterways to facilitate the transport of merchandise. Much of them still retain this function. However, those who over time were not proven efficient for transportation of merchandise have developed other functions, particularly tourism and recreation.

Often, only the transport function of the inland waterways is taken in consideration from the European policy perspective. In reality, they represent a multi-functional resource, offering a wide range of services to society - economic, social and environmental.

In Europe, inland waterway transport is a major objective. [1] Twenty EU Member States are interconnected by approximately 37.000 km of inland waterways.

Using them for transportation represents a competitive alternative to road and rail transport, by reducing energy consumption, noise and emissions. Energy consumption related to km / tone is approximately 17% of the energy consumption of road transport and 50% of rail transport. In terms of noise pollution and gas emissions, it is almost non-existent compared to road and rail transport. [1]

Using inland waterways helps to decongest road traffic in populated areas and increases safety for the transport of dangerous merchandise. According to recent studies made in the European Union, the total cost of transport by inland waterways regarding accidents, congestion, noise, emissions and other environmental conditions impact is seven times lower than for road transport. [2]

A. History

Bega Canal takes from south of Timisoara the river Bega waters and directs them to the Yugoslav territory, thru south of Beba Veche.

Before being arranged, the river in the low plain had a lack of stability. Because of a very small slope (less than 0.40 m / km), shallow drain is reduced and infiltration of precipitation is difficult. Because of this, extensive areas of land were subject to the inter Bega-Timis floods and swamp.

In such a region, on an island surrounded by two large rives: Timis and Bega, the city of Timisoara was built. Unhealthy climate, hard to bear by the population and the growing need for agricultural land, required works of marshland draining and settlement to Bega river.

Settlement works to Bega river downstream of Timisoara continued, the main goal being the creation of a communication thoroughfares to the west (Timisoara -Tisa).

According to some records, navigation on the canal began in 1729, although the canal was officially opened to traffic in 1760. Bega channel has a total length of 115 km (between Timisoara and Titel), of which 45 km (39,13%) are on the Romanian territory.

In order to ensure the fall of the water (4 m) required by the turbine, in addition to the dam upstream of the plant, the channel bed downstream was deepened by 1m; Under these conditions, all the channels and ponds were plugged; the water level dropped and the health of the city has improved.

Between 1900 - 1916, it was built on the waterway a system of sluice-gates (6 weirs) to ensure adequate depths for navigation in all seasons. Of the 6 weirs, two are in Romania (Sânmihai and Sanmartin). [3]

B. Technical data

According to PATJ Timis [4], it is desired to:

• improve transport infrastructure and related services on Bega channel

• development and diversification of tourism offer by promoting cycle tourism and the usage of border tourism potential including cycling track along the Bega River, downstream of Timisoara. The cycling track will be located on the route Timisoara - Freidorf - Utvin - Romanian Sînmihaiu - Uivar - Otelec - border with Serbia.

To use the potential of waterways in relation to the requirements of a sustainable society development and in line with European Directives greening works to Bega channel are required. On the Timişoara - Serbia border Vdragat = 0,7mil. m3.

The Timisoara Bega Channel banks PUZ [5], proposes the development of the Bega channel banks in the Timisoara city limits by turning them into an attractive promenade areas for city residents.

Initial cross-section Bega Canal was trapezoidal,

with small base b = 15 m, slopes 1: 2 and water depth between 2.5 and 4 m. The channel slope on the route from Timişoara to Serbia border is less than 1%. At an average flow of 13,2m3 / s, the speed is 0,620m / s (measured at hydrometric station Otelec).

II. METHODOLOGY

The methodology used to develop the case study on the Bega channel, was synthesized based on bibliographic research findings in terms of sustainability. Using Bega channel for transport can result in minimizing loss of agricultural land, road congestion, road accidents cost reduction, reduced energy consumption and pollutant emissions (which cause climate change).

Globally, sustainability in transport (Fig.1) involves minimizing the impact on the environment and society, as well as reducing the amount of carbon currently used in road construction. These initiatives can be implemented if the watercourses would be take into account national level.

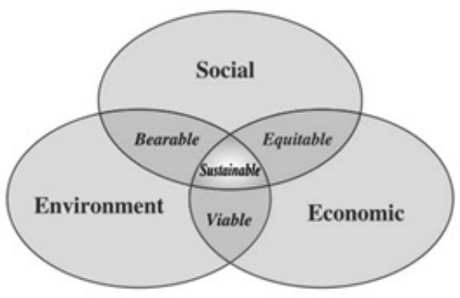

Fig. 1. Sustainability diagram

Good management and good administration of waterway transport routes must create a sustainable system. Sustainability in the transport system has four components: financial/economic, operational, environmental and social. [6]

A. Financial/Economic sustainability

It depends on the availability and use of resources to meet market needs for transport (of merchandise or persons) in a way to help economically the society as a whole.

Resources should be provided for adequate and reliable navigation, taking into account all users of the watercourse. Channels must be able to offer an efficient way of taking over the vessels: present no obstacles, harbors shall have docking points for boats etc.

For a water transport system to be financially sustainable, earnings after completion, should cover the costs of construction, maintenance and any periodic improvements.

Inland waterways help in terms of economic and social regeneration of adjacent land. The juxtaposition of green and blue areas creates spaces where people choose to live or work.

The attractiveness of channels improves the economic performance of regions or localities by: [7]

• increase of civic pride and improving the image and the perception of a locality; the water can become brand city - Bega Town (channel will become navigable and will soon be flanked by pedestrian paths and bicycle lanes). Unfortunately, it's hard to position a relatively unknown brand to foreigners - Timişoara - by referring to another unknown brand - Bega.

• attracting private sector investments to regenerate adjacent watercourse areas. In Bega Canal banks and its area of influence P.U.Z., are defined two zones (Iosefin and Fabric) where is desired to eliminate the pollutants generating functions, noise, dust, odour, thru the conversion of existing industrial areas into areas for housing, offices and services in the vicinity of the channel. Studies realized in Europe show that property values adjacent to properly constructed watercourses may rise by up to 20%.

• creating a new type of tourism – tourism on waterway;

• creating new jobs in the shipbuilding industry; creating small and medium-sized companies in manufacturing or services.

Inland waterways support many types of businesses:

• tourism industry; develop small and medium enterprises whose purpose is to serve tourists - creating docking space or ports for ships, companies that hire pleasure boats, pleasure craft operators, shipbuilders, hospitality, restaurants, etc. Tourism on the waterways becomes very important in rural areas - can help communities develop cultural heritage.

• building industry; installations or ships are needed to maintain a optimum operating channel etc.

• non-profit associations; In some regions these organizations create community activities on or near the water.

• cultural environment; increasingly the artistic activities gather along the water front bringing it back to life and giving it a distinctive character.

B. Operational sustainability

It involves managerial, technical and technological capability to build a waterway transport infrastructure. Using and maintaining this type of transport should be efficient and reliable.

C. Environmental sustainability

Water channels facilitate interaction between man and nature, which may cause a conflict between navigation / tourism / recreation and the natural environment. Inland waterways create habitat corridors for wildlife and ties in quite fragmented natural landscape. The human presence on land and water with the help of boats may endanger the natural environment.

Urban development proposals set out in "PUZ Bega Canal banks and its area of influence "want to prevent environmental impact as follows:

• to maintain the quality and integrity of water resources, periodic checks on the Bega Canal banks are made; running maintenance and sanitation of banks, cleaning and sanitation in the forests etc.

• canal desilting and cleaning on a distance of 20 km aims to reduce the risk of flooding.

• for diminishing the pollution of the watercourse of Bega channel, measures can be taken to check the condition of sanitation, to detect those who discharge their waste water and to apply drastic punitive measures.

• air quality can be improved by mechanical, chemical and biological control of main allergenic plants.

• to reduce noise and create an "oasis" of tranquillity on the banks of Bega, it is recommended: the construction of bike lanes, planting trees and shrubs as "green walls" to create a "clean air corridor" along the Canal Bega.

D. Social sustainability

Inland waterways generate outdoor recreation

space for the community it passes through (Fig.2). Usually banks are flat surfaces that provide easy access for elderly or disabled people.

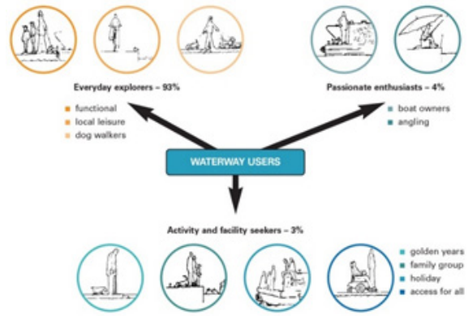

Fig. 2. Waterway users [13]

An active lifestyle is essential for health. Recreating in relation to water (on the water or in its vicinity) plays an important role in combating stress and generates wellbeing. [13]

The banks of waterways can have walkways, bicycle paths and pedestrian bridges that offer people relaxing route along the water. Canal banks should become an attractive and promenade.

Other sports that may occur include: fishing, canoeing, rowing, sailing, swimming etc.

E. Timisoara –Industrial harbour

With Bega channel, Banat received a direct link with the West, for transporting goods. Bega Canal was the principal commercial way of Timisoara.

Port of Timisoara was tied to Europe through channel Bega, Tisza river, Danube river - to Rotterdam and then by transhipment - the Rhine to the North Sea. Has facilitated transport of agricultural products to Vienna, but also on the Adriatic coast. They were carrying more than 250,000 tons of cargo annually on Bega. [2]

At the moment, it is wanted in the outskirts of Timisoara - specifically in the area Freidorf - to achieve a industrial and commercial port the Bega channel.

"The resumption of navigation on the Bega would create an economic alternative for merchandise and passengers transportation, especially that of large products with small perishable time. Through the connection with the

Danube, access is gained directly to transport corridor VII - Danube-Rhine-Mein which crosses Central and Western Europe and provides the connection between the Black Sea and the North Sea. Between 1888-1950, a large part of the transport to and from Timisoara was taking place thru Baziaş Danube port, which was connected by railways with Timisoara thru Timisoara-Vîrşeţ-Iasnovo-Baziaş railway." [8]
„I see an industrial port built outside Timisoara, since such a goal requires the construction of larger pools, where they can dock cargo ships. This requires infrastructure: cranes, power, all associated facilities. The port would hire people - about 100-200, depending on the activity to be held here. First, the weirs must be completed at Uivar Sânmihai because without them we can not do anything, because otherwise the vessels can not enter on the channel." [8]

III. STRATEGY

Geographically, the basin area of Banat, located in south-western Romania, has an area of 18,320 square kilometres which represents 7.7% of the total area of the country. The territory of Banat Water Directorate, include the following basins: Bega-Timis, Caras, Nera-Cerna, Danube tributaries.
For Bega channel, the following objectives can be necessary and opportune:
Short term objectives:
• rehabilitate channel Bega inside the city of Timisoara and use navigation for public transportation
• rehabilitation and modernization of the two locks of the Romanian Sânmihaiul and Uivar.
Medium term objectives:
• Create an industrial port for Timişoara
• promote the support and participation of Romania in the rehabilitation of channel Bega in Serbia.
• Create small ports for leisure ships / boats
In the long term:
• full rehabilitation and modernization of the Bega channel to allow larger shipping vessels - especially those used for cargo transport.
• extend the waterway of channel Bega upstream and connect the city of Timişoara with the town Lugoj by water.
• Create a channel to connect channel Bega and river Mures.

A. Public transportation

Timisoara City Hall promised public transport on Bega channel. The stations for the vaporetto type vessels are being built on the banks of Bega. [9]
Passenger boarding-landing stations will track the main traffic nodes and the proximity to other transport stations (Fig.3):

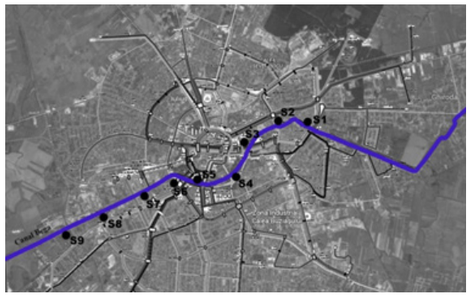

Fig. 3. Map Timisoara – Vaporetto stations and RATT stations

• Station 1 - north shore, left of Mihai Viteazul bridge
• Station 2 - north shore, right of Dacilor bridge
• Station 3 - north shore, right of Decebal bridge
• Station 4 - south shore, right of Michelangelo bridge
• Station 5 - south shore, left of Metropolitan Şaguna bridge
• Station 6 - south shore, left of Traian bridge
• Station 7 - south shore, left of Stefan cel Mare bridge
• Station 8 - south shore, vis-a-vis of Str. Eagles
• Station 9 - south shore, left of Modoş bridge.

B. Leisure transportation

The city of Timisoara lacks the possibility to travel by boat mainly because of the small numbers of vessels; there are no fuel stations for vessels; no passenger boarding-landing stations; no traffic signals; no sites for private vessel docking etc. Reorganizing naval traffic for Bega channel involves creating areas to house complementary functions. It is necessary to create docks for small/medium size leisure vessels from all around Europe. The navigator's intention is to travel, to visit new places, to come in contact with other lifestyles, to see and learn interesting things. Nobody buys boats to keep them locked up or not having a place in which to dock.
Mooring spaces for sailing and motor boats have to be planned carefully to make optimum use of the water area available. For reference, allocate 4-5 sailing boats or 6 motorboats per hectare of water area. The necessary depth of water in harbours depends on the types of boats to be accommodated. Usually, dinghies and yachts with centre-boards require a depth of 1.25 m, whereas fixed-keel boats need 4-5 m. Constant water levels are preferable for the safety of boats. [10]
Along channel Bega are places/ lands that can be converted into docking ports for private vessels. It is preferable if they are in close proximity to the historic centre - favours pedestrian accessibility to the central of the city, but at the same time they should not be positioned in the central area in order not to jeopardize the existing parks.

C. Cargo transport

In the European Union, transport depends on oil and oil products for > 96% of its energy needs. Europe imports around 84% of its rough oil from abroad. In 2010, the EU's oil import bill was around 210 billion euro. Transport greenhouse gas emissions increased by around 34% between 1990 and 2008. Transport accounts for about a quarter of the EU's greenhouse gas emissions. And freight transport activity is projected to increase by around 80% by 2050 compared to 2005. [1]
According to the 2013 annual report of the INE (Inland Navigation Europe) 5.8% of all freight in the EU is on Inland Waterways (Europe has approx. 40.000km of navigable channels). Percentage increases in countries with good shipbuilding infrastructure (Fig.4).
The development of the transportation system has closely followed the global economic development, which required continuous increase in freight volume. Thus, leading to increasing numbers of freight road vehicles, costs, pollution, accidents and adverse social effects. It is necessary to separate the economic growth from the increased transport volume, in order to achieve further economic growth without having adverse effects; promoting new and safe ways of "environmentally friendly" transport.

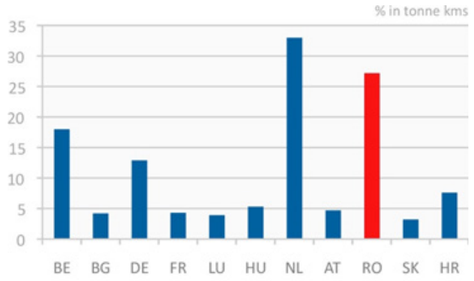

Fig. 4. Modal share of IWT by country [1]

Given the fact that most of the finished products are transported in containers, it is estimated that in the XXI century multimodal transport, along with the technological improvements in the transhipment systems, becomes the cornerstone of international trade. Multimodal transport allows linking different modes of transport according to their specific advantages (Fig.5); such as the flexibility of the road transport, the high capacity of rail transport, low shipping costs and high speed air transport. [11]

Fig. 5. External and infrastructure costs container transport [1]

The Blue Book, 2012 [12] presents the inland waterways of international importance (Fig.6). In the 29 172 km of European waterways is included Bega channel (E 01/02/80), composed of three parts:
• Tisa-Klek - 34.1 km - maximum dimension of vessels 85m / 132m (L) x 8.2m / 11.4m (l) x 2.5m (draught) - Class Va - canalized
• Klek-Itebej - 31.5 km - maximum dimension of vessels 70m (L) x 8.2m / 9m (l) x 2m (draught) - Class III – lock Itebej is out of order

• Itebej-Timisoara - suggested as a missing link in the network of inland waterways of international importance.

Fig. 6. European waterway maps [1]

The ship sizes, that can currently navigate the channel Bega in technical conditions, can't overcome 65m long, 8.2m wide and 1.2m draught. Under bridges, the ships superstructure shall not exceed 5.7m (Otelec-km112 + 500) or 4.3m (km112-km118 + 350 + 500).

According to Banat Water Directorate in the first phase, the channel will be deepened 70 to 150 centimeters, and in the second stage, the channel will be deepened by up to 7 meters and will allow the navigation of higher sized vessels (Fig.7).

Positioning the Multimodal Regional Center Freight Transportation (Fig.8) near Remetea Mare at a distance of approx. 5 km from the city of Timisoara allows direct access to three communication routes - road, rail, air - with the ability to be connected to the inland waterways. Bega Channel is also in close proximity of the highway ramp Timisoara-Arad.

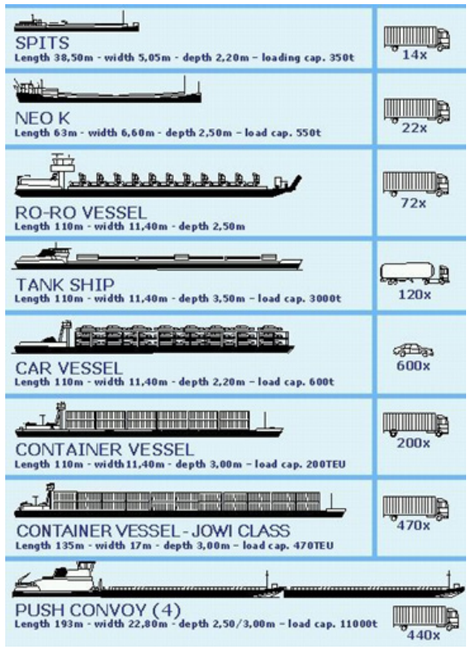

Fig. 7. Vessels dimensions [1]

Fig. 8. Map - multimodal transport Timișoara

IV. CONCLUSIONS

Resuming the navigation, the possibility of carrying some of the freight on Bega channel and connecting the city Timişoara to Trans-European Transport Network – connection to Railway axis no. 22 and Road Axis no. 7, which allows splitting the freight load between the two types of transport (rail / road); connection to the international airport Timisoara Traian Vuia by railway [11] - will give both Timisoara and to the region a major economic boost.

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Urban risk of reinforced concrete frame buildings with masonry infill walls subjected to seismic actions

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ABSTRACT
This paper presents the impact that the seismic behaviour of reinforced concrete frame buildings with masonry infills has on the urban landscape of the city of Timisoara. The lack of seismic detailing of buildings from Romania built before modern seismic design codes can be hazardous for a city and its inhabitants. In this article there are proposed various strategies of decreasing the urban risk of such buildings.

Keywords: urban risk, infill wall, seismic action, reinforced concrete

I. INTRODUCTION

Timisoara is the largest city in the western side of Romania, being situated in the Timis County from the Banat region. The western side of this region is bordered by Serbia and Hungary, while at the east there are the inferior Carpathian Mountains. Timisoara has a very large architectural masonry heritage because it was part of the Habsburg Empire. The first RC structures can be traced as far back as the beginning of the 20th century, but the material has started to be implemented on a large scale only after World War 2, during the communist regime as a result of an increased construction rate. Between 1960 and 1975 [1], in Timisoara there were constructed large numbers of residential and apartment buildings in order to accommodate the incoming work-force, having simple construction details which were very easy to be implemented. Two structural systems can be generally distinguished: a mixed system consisting of RC frames with perimeter diaphragms and central tube, and RC frames with masonry infills. The RC frames with masonry infills represent the most vulnerable structural system, while the latter can be characterized by good rigidity and dissipation capacity of seismic energy. A new constructive system was introduced at the end of the 1970s, consisting of large RC panels which were proved to be fast, efficient and having a good seismic behaviour. A lot of these apartment building suffered modifications as a result of the market demand, such as: introducing additional loads by constructing an extra level over the roof, increasing of living space by removing partition walls, leading to an increase of seismic vulnerability [9]. Fig. 1 presents the zones in Timisoara, in which apartment buildings with masonry infill RC frames were built.

II. BANAT SEISMIC REGION

Romania has been classified as a country having a large risk from seismic point of view. Banat region is regarded as the second most important seismic zone, considering the energy and the number of seismic events, being subjected to shallow earthquakes of crustal type. In this area the earthquakes which occur are characterized by a small depth of the seismic source, somewhere between 5 and 15 km and having a reduced surface of the epicentre area where the effects are maximum.

Fig. 1. City of Timisoara – apartments built between 1960 and 1975 with RC frames and masonry infills prior to modern seismic design codes [1]

A. History of earthquakes

The seismic activity from Banat region can be described as a relative small number of preshocks, followed by a large number of aftershocks. The main faults have different orientations and depths. The largest earthquakes have their seismic sources usually located at the intersection of seismic faults or near geological faults of different ages. There are indications of a relative large number of zones with a large seismic risk according to the spatial scatter of epicentres of the recorded earthquakes from Banat region, as it can be seen in Fig. 2.

Fig. 2. Earthquakes from Banat region

Earthquakes recorded in Vrancea region, which is the most important seismic region from Romania, were also felt in the Banat region. Earthquakes from Serbia can also affect Timis County and the city of Timisoara, because of their proximity to the border. In the following table there are given data regarding strong earthquakes which occurred in the Banat region.

Table1. Zones with most important earthquakes, intensities and year of occurrence [2]

Epicentre zone	Maximum intensity (MSK)	Year
Sanicolaul Mare	VII	1879
Barateaz	VII	1900
Periam – Varias	VII	1859
Jimbolia – Bulgarus	VII	1941
Carpinis	V	1889
Sanandrei – Hodoni	V	1950
Recas	V	1896; 1902
Timisoara (Mehala)	VII	1879
Sanmihai Sacalaz	VI	1973
Sag – Parta	VII	1959
Rudna – Ciacova	V	1907
Liebling Voiteg	VII VIII	1991
Banloc – Ofsenita	VII – VIII	1915; 1991
Moldova Noua	VIII	1879

Timis County includes zones with the main recurrence interval for earthquakes of 50 and 100 years, as it can be seen in Figure 3, which can be evaluated in terms of peak ground acceleration, between ag=0.10g and ag=0.25g. As a result, a lot of existing buildings were not designed to seismic action, or were designed for much smaller values of ground acceleration.

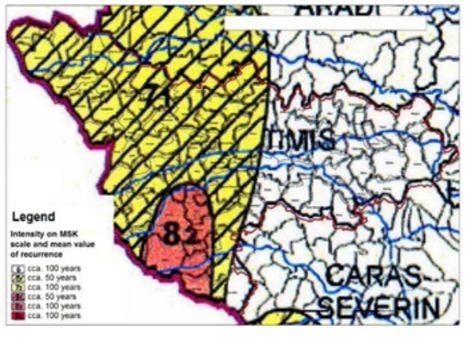


Fig. 3. Intensity on MSK scale and mean recurrence interval

The number of inhabitants from the most populated cities exposed to the seismic risk in the Banat region can be seen in Table 2.

Table 2. Macro-seismic characteristics of most important cities from the Banat region in the year 2009

City	No. of inhabitants (2011 Census)	Seismic intensity (MSK)	a_g for MRI 100 years
Timisoara	304467	VII	0.20g
Lugoj	37321	VII	0.15g
Buzias	6504	VII	0.15g
Deta	5963	VIII	0.20g
Jimbolia	10048	VII	0.20g
Sanicolau Mare	11540	VII	0.20g
Ciacova	5028	VIII	0.25g
Gataia	5449	VII-VIII	0.15g
Recas	7782	VII	0.20g

B. Timisoara micro-seismic area

A geotechnical map was established after several geotechnical studies were made in Timisoara. Several soil types were mapped, as it can be seen in Fig. 4: clays and silty clays were mainly found on the North part, while on the South part, the dominant soil type was a mixture of clay with sand. The positioning of the seismic fault lines were also illustrated on the aforementioned map. The behaviour of the RC frames with masonry infill walls can strongly be affected by the local soil conditions and by the fault lines that cross the city of Timisoara due to similar periods of vibration, thus increasing the risk of such type of structural systems.

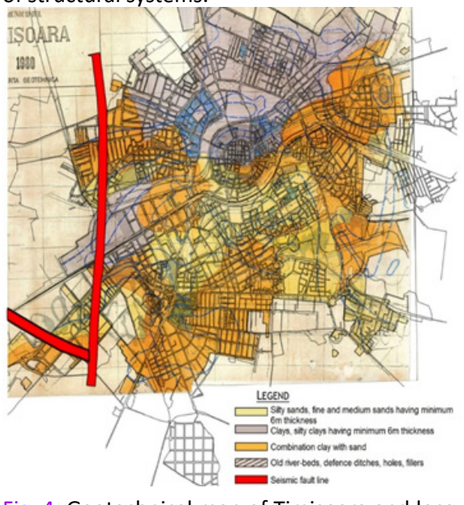


Fig. 4. Geotechnical map of Timisoara and location of seismic fault line

III. EXISTING BUILDING STOCK FROM TIMISOARA

In Timisoara, the collective housing construction gained momentum after 1962, when the first neighbourhoods of blocks began to appear, especially for immigrants arriving in the city from Oltenia, Moldova, Maramures, and Transylvania [10]. In Timisoara there were built 61,000 apartments only in the period 1965-1980, able to accommodate a total of about 212,000 inhabitants [1]. Among them we can point out the following [3], as it can be seen in fig. 5:

- Tipografilor and Calea Lugojului, with 4,500 apartments and 15,700 inhabitants;
- Circumvalatiunii, with 11,400 apartments and 39,900 inhabitants;
- Calea Sagului and Dambovita, with 12,582 apartments and 44,000 inhabitants;
- Stadium, County Hospital and Timisoara South, with 5917 apartments and 20,700 inhabitants;
- Sportivilor and Negoiul, with 3,132 apartments and 10,900 inhabitants;
- Calea Girocului, with 4,540 apartments and 15,900 inhabitants;
- St. Plavat, with 4473 apartments and 14,700 inhabitants;
- Calea Torontalului, Calea Aradului, Calea Lipovei and Matei Basarab, with 11,525 apartments and 40,300 inhabitants;
- Ion Ionescu de la Brad, with 2.404 apartments and 8,500 inhabitants;
- Marasti, with 595 apartments and 2,100 inhabitants.

The communist regime has adopted a policy of building in Timisoara based on achieving residential assemblies relatively small in size, able to accommodate on average a population of approx. 10,000 inhabitants. New residential districts were built on the remaining undeveloped land without demolishing existing urban tissue [4].

The process of building collective housing neighbourhoods in Timisoara, has four major stages [5], each characterized by specific approaches in terms of density of public housing units and facilities offered to community members, physical organization of the neighbourhood, surface and the organization of the apartments, and overall appearance of the neighbourhood and the buildings themselves. These stages are:

- The stage between 1962-1975
- The stage between 1975-1982
- The stage between 1982-1989
- The stage after the year 2000

Fig. 5. Map of Timisoara, marking collective living quarters [1]

a) The stage between 1962-1975

The first stage of development of the phenomenon of collective dwelling, between the years 1962-1975, produced in Timisoara, neighbourhoods characterized by low comparative density of approx. 100 dwelling units / ha, within which apartment buildings are located at relative large distances to one another, up to 60 m, thus providing a high degree of privacy to the inhabitants, see fig. 6. Although the area of apartments is low, providing an average of just 7.7 square meters / inhabitant [6], the neighbourhood offers all the necessary public facilities for the community members, such as schools, kindergartens, sports fields, shopping facilities, etc.

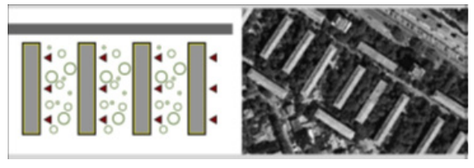


Fig. 6. Circumvalatiunii neighbourhood, Timisoara (the 1960s) – structure principle and satellite view

Collective housing neighbourhoods erected during this period are organized in agreement with the principles of the socialist ideology of the time, which relies on eliminating service

functions inside homes and outsourcing them to the public spaces in the neighbourhood, in order to encourage community living. Regarding the structural system, the majority of the buildings were constructed having reinforced concrete frames with masonry infill panels.

b)The stage between 1975-1982

The second stage of development of collective living quarters was held in Timisoara in the period 1975-1982, is characterized by a forced densification of the built tissue, explicable in the context of meteoric growth in the number of inhabitants, which is determined by the accelerated industrialization of the 1970s.

Statistically, Timisoara's population increased during this period, from 151,995 inhabitants in 1965 to 312,720 inhabitants in 1984 [1]; population growth has led, consequently, to accelerate the pace of construction of buildings and residential complexes, in the early 1980s reaching the record figure of 3,000 apartments / year. In this context, collective housing neighbourhoods erected during the years 1975-1982 are characterized by very high densities, over 300 residential units / ha, while apartment buildings are located at small distances from each other, only 15 m, see fig.7.

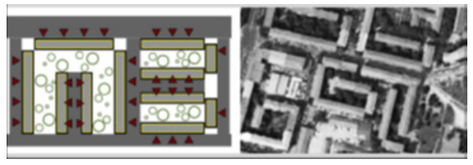


Fig. 7. Timisoara South neighbourhood, Timisoara (the 1970s) – structure principle and satellite view

Also in this period, public utility facilities in neighbourhoods disappear almost entirely, the only exception is constituted by the commercial function, which develops on the ground floors of buildings located along the main arteries. Although there is a vague increase of surface housing units from 7.7 square meters / inhabitant in 1966 to 8.3 square meters / inhabitant between 1975-1980 [6], apartments remain minimal. In the majority of cases, these buildings were constructed using large reinforced concrete precast panels.

c) The stage between 1982-1989

Finally, the years 1982-1989 round up substantial improvements from the previous periods, the now erected neighbourhoods are characterized by relatively low density of approx. 100 housing units / ha. Simultaneously, apartment buildings, set around the inner courtyard enclosures type, are at considerable distances from each other, up to 50 m, see fig. 8, while the apartments themselves significantly increase their surface (Table 3.) [7]. Public utility facilities, such as schools, kindergartens, sports fields or green areas, were reintroduced to the neighbourhood. The structural systems of these buildings are consisted of precast reinforced concrete panels.

Fig. 8. Soarelui neighbourhood, Timisoara (the 1980s) – structure principle and satellite view

Table 3. Common areas of housing units in the period 1982-1989

Room/apt. No.	Living area m^2	Net area m^2
1	24	37
2	43	67
	51	79
3	55	85
	65	101
4	69	107
	77	119
5	89	138
	94	146

d) The stage after the year 2000

The contemporary step, which includes real estate developments after the year 2000, resumed the process of building collective housing after stagnating for almost 10 years. Unfortunately, the new inserts overall quality is low in many cases.

This is because new developments were made, almost without exception, in order to achieve an immediate profit, investors actually ignoring the needs of the city and the local community.

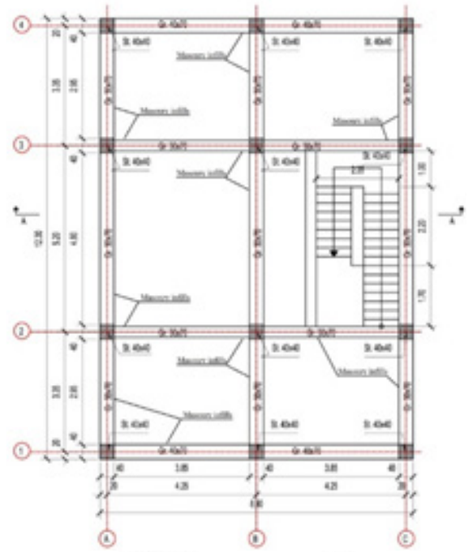
IV. SEISMIC VULNERABILITY OF RC FRAME BUILDINGS WITH MASONRY INFILLS

Earthquakes can do damage to all buildings situated in a seismic zone. A buildings ability to be affected by the seismic action represents the seismic vulnerability, which can be quantified by the damage level of the entire building or of a certain building element [9].

Considering the large number of apartments built using RC frames with masonry infill panels in Timisoara prior to the development of the modern seismic design codes from 1978, it is important to assess their vulnerability correctly. In more recent times, due to architectural needs which require more space changes to the structural system have been made, mixed-use developments tend to affect the building vulnerability to seismic action. The construction of balconies at the ground level represents a first category of modifications, extending the living space. The repartitioning of the apartment is a second category of interventions, by eliminating the wall between the kitchen and the hallway, or by removing the pantry room. Transforming the apartment into a commercial space represents a third category of interventions, mostly done for the apartments from the ground level. The improvement of the building thermal insulation represents the most common type of intervention. This is achieved in two ways: the minimal intervention is done by applying polystyrene on the exterior envelope of the structure, and by constructing roof framing systems which represent an additional level over the usually flat roof.

By introducing additional loads all the aforementioned structural interventions can increase the seismic vulnerability of the masonry infill RC frame buildings, creating weak zones in the structure where the efforts are concentrated. A soft-storey effect can be created by removing the infill panels in order to increase the living space or make room for storage areas, which in case of an earthquake can prove to be very dangerous [9].

The rigidity of flexible structures from seismic zones with small values of Tc can be increased through the presence of infill panels, which can lead to an increase of the seismic forces over the normal level.



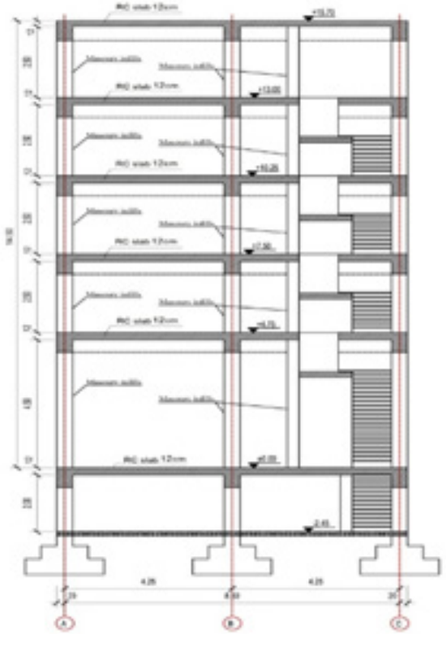


Fig. 9. Example of RC frame with masonry infills designed according to P13-63 seismic provisions

The seismic forces can be reduced by removing such panels, thus increasing the flexibility of the structure; however such type of structure dispose reduced re-centering capacity. Structural plan alterations can also introduce torsion effects on the structure, by modifying the centre of rigidity, leading to unfavourable failure mechanics.

The most common type of RC frame with masonry infill walls built in Timisoara has a basement, ground floor and four stories, as it can be seen in fig. 9. The clear height of a current level is 2.5m while for the ground floor there are 4.5m, being ideal for commercial space. The building has two spans of 4.25m and three bays of 3.35m and 5.2m respectively. The dimensions of the columns are 40x40cm on which there are supported transversal beams of 40x70cm and longitudinal beams of 30x70cm. The dimensions of the beams are hidden in the thickness of the masonry walls. Masonry walls of 40cm thickness are placed at the exterior and 30cm thickness are used for interior walls together with compartment walls of various thicknesses. No special anchoring of the masonry panels to the RC frame was provided. The RC slabs over each storey have 12cm thickness. Isolated foundations are present under each column.

After the earthquake from 1977 from Bucharest, structural damages have been recorded in these buildings. There were no damages recorded in Banat region after the earthquake from 1977 due to the fact that the distance between the columns is relatively small (3-4m) and the thickness of the walls is larger than 30cm.

V. CONSOLIDATION MEASURES

The student architects from the Faculty of Architecture and Urbanism from Timisoara, and PhD students from the Civil Engineering Faculty, proposed a set of consolidation measures. One of the proposed methods is generally used for retrofitting damaged buildings and refers to an exterior consolidation with steel profiles of the building frame [8]. The interventions are based on the concept of sustainability and further defined in terms of energy consumption, aesthetics and lighting. Beside all the energy efficiency, these types of interventions targeting to secure the exterior veneer panels to unfavourable out-of –plane failures in case of seismic action.

Focuses on the proposal that consists of a 4 layer curtain wall system which will support the existing facade and provide sustainability for the building, can be seen in fig. 10. The first layer provides shade during the summer period, together with small reservoirs for clearing the facade, followed by a second fixing layer made of steel profiles. The third layer consists of a perforated steel profile which protects the building from external actions and acts like a cooling system for the facade during summer time. The fourth layer represents the structure of the curtain wall in order for it to work on two directions while strengthening the existing structure. Some advertisements can be placed on this system in order to obtain some financial benefits.

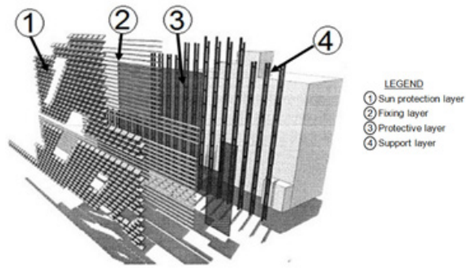


Fig. 10. Proposal of a four layer curtain wall in order to work together with the building facade

The proposal of consolidation attempt to provide a seismic protection of buildings by increasing mainly the rigidity, thus limiting the degradations, displacements and damages as well as trying to avoid the collapse of structural and non-structural elements of RC frames with masonry infill walls. Another benefit factor of these proposals is given by the ease of implementation and the architectural expressivity of these systems without affecting the ongoing activities inside the building. Further experimental and analytical investigations, towards this direction, should be carried out.

VI. CONCLUSIONS

In this paper there was performed a synthesis of the existing building stock from Timisoara, highlighting a specific trend in the construction techniques used in each period. The buildings constructed before modern seismic design codes, consisting of reinforced concrete frames and masonry infills were subjected to an analysis in order to assess their modifications which could later have a negative effect on their seismic behaviour. By studying a large number of these constructions built during the communist era of our country, in function of particular structural systems, the vulnerability should be evaluated and how it affects the urban landscape of the city [2]. No major damages were recorded by the buildings from Timisoara, possibly due to the small distance between the columns and bearing elements. The risk is nevertheless present at an urban level due to the fact that two fault lines cross the city and the increased level of seismicity from Romania. Some consolidation measures were investigated from the point of view of sustainability which aims to improve the overall seismic behaviour of buildings in such a way that it is provided a support for the facades, strengthening the building. The prevention of out-of-plane collapse is tried to be achieved and within the INSYSME research program, corresponding consolidation measures are going to be studied and there will be sought out an effective way of implementing these measures.

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Waterfront regeneration through landscape urbanism: Abatorului Square – Feroviarilor Park, Cluj-Napoca

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ABSTRACT
Throughout history, water – primary natural resource – has played a significant role in the establishment of human settlements and in the defining their own identities. The connection between the waterfront and the city was interrupted in the industrial era, but with the increasing environmental awarness and the pressure of global urbanization, waterfronts have been redescovered. Therefore, regeneration projects of these areas have become an effective tool for urban planning.
Waterfront revitalization transforms the site into a dynamic space, one that is attractive to the public, providing wide visual and phisical access to the banks through the land. Facing the city towards the water and building the connection between the two of them endow the waterfront with outstanding urban and natural environments. Moreover, this process leads to vitality with the help of a space that contibutes to the quality of life from all points of view – economic, social and cultural.
The former Slaughter House site cleaned out with buildings and Feroviarilor Park offer this kind of development opportunities by putting forward Somesul Mic River and by regenerating its waterfronts.

Keywords: regeneration, revitalization, waterfront, urban space, landscape, urbanism

I. INTRODUCTION

Waterfronts represent centres of interest in most cities. These areas once defined by transport, commerce, industry and warehousing in the industrial era, changed into waste land and were abandoned by community when industrial activities moved outside the city, through the evolution of containerization technology. During the past decades, following the changes within the post-industrial economic system, cities are facing new urban regeneration challenges, starting with urban planning and carrying further with economic, environmental, cultural and social planning. Among all these changes and problems that captured the public's attention, is listed the transformation of derelict land areas located near the water into new functional spaces, with opportunities which imply valuable real estate development.
Starting in the 70s, in North America, with the successful project of Baltimore Inner Harbour , urban waterfront regeneration has been spreading in many cities around the globe – London, Liverpool, Barcelona, Genoa, Hamburg are only a few of them. These types of projects, aiming at reintegrating abandoned waterfronts in the urban fabric, have become an international phenomenon of urban renewal. In the early 80s, this subject is argued in trade literature, where the process is illustrated from urban planning, economic and geographical considerations.
Due to the beneficial location, at the boundary between water and built environment, near the city center, waterfronts provide urban spaces that can be highly exploited and result in great projects residing in functional mixture, high density, blending of social classes and countless possibilities to encourage walk ability.
However, the role of waterfronts in urban regeneration and the way they can be integrated in urban planning still arouse issues for the local authorities. How to avoid fulfilling a stereotyped project, when actually searching for waterfront authenticity and its integrity which offer genius loci? How to create an attractive waterfront urban space in order to attest the image of a dynamic city which can persuade people to come, work and live here, or at least visit the place, generating positive effects for the local economy?

II. SHORT HISTORY OF WATERFRONT REGENERATION

The thirty-year history of the waterfront regeneration model was divided by Vallega – Italian writer and professor of urban and regional geography at Genoa University, Italy – in two phases. [1] The first period, lasting from the 1960s to the mid-1990s, is marked by the Baltimore syndrome, where the waterfront revitalisation structurally involved a combination of local needs, employment and real estate development. The basic idea of the Baltimore project was turning a waste waterfront area of 100 hectares, situated in the heart of a run-down industrial city, into something quite the opposite based on commercial development. [2] The new masterplan of the emplacement was conceived in the 1970s, and the first buildings were completed at the end of that period. The buildings were the result of a projection supported by the local authorities and by private companies as well. Also, there were some other elements that led to success, like the advantageous location of the site in the center of the city, the direct access to the water and the small competition for the land.
The new development generates annually around 4 million US dollars in taxes, has 22 million visitors and tourists per year, embodies a major centre of congresses, and provides a number of new jobs estimated between 5000 and 20000. [3]
The second phase of the waterfront regeneration model, from the mid-90s until the present day, is influenced by sustainability precepts. Vallega considers this impulse towards sustainable development as being driven by two events – climate change and Globalisation. Thereby, the sustainable development becomes a guideline for urban planning. The initiation of ideas around sustainability began with the publication of the Brundtland Commission. [4] This document defined sustainability as a development that provides for the general needs of the actual generation without compromising the ability of the future generations to meet their own needs.
Reaching the European continent, waterfront regeneration in the United Kingdom was induced by the new urbanist movement which

had as key elements the mixed development, the diversity of urban spaces regarding walkability and environmental sustainability. It is important to be mentioned that in the industrial era, these areas were very active, but after they were abandoned, the access to the water became quite difficult and the people could not benefit from strolls along the banks. It is true that nobody would have wanted to walk through such places taking into consideration the high levels of pollution affecting many of the British rivers. During the 80s, the industrial collapse and the implementation of new regulations concerning discharges and the efficient treatment of polluted water meant a significant improvement of water quality, so that, for example, in the early 90s, salmon returned to the Mersey River, which was once toxic.

Waterfront regeneration allowed public access to the shores and improved the aquatic environment. This fact reinforced the inborn attraction for waterfront sites, with the aesthetic allure of this natural element, with the feasible recreational facilities and with the supplied dynamics. The urban public spaces created on waterfronts emphasize a new type of waterfront development – the promenade. The promenade represents an urban form which emerged in the 18th century, in England. As part of English concerns for the health of the body, some therapeutic sites were built where people could receive treatment against ailments of that period. These kind of methods included thermal water in Bath and swimming along with breathing salt air in Brighton. The particular procedure in Brighton was founded on a sea promenade, designed to protect individuals from tidal encroachment with the help of seawalls. Together with the promenade, the real estate opportunities materialized. One such example is the development of Kemptown [5], an important constituent of the 19th century urbanism. The project resulted in a novel urban model composed of a promenade and public urban spaces along the shore, which was enclosed by buildings accommodating apartments, hotels, shops, restaurnats and offices.

The pioneers of waterfront regeneration were urban development corporations and not private developers. These tools used by the British government in highly deprived areas were rather successful with Canary Wharf in London and the Albert Dock in Liverpool.

The mixing of uses in the Albert Dock was ground-breaking for Great Britain in that period, and at the same had some points of risk for a city in property market depression. However, the project avoided the crisis at the beginning of the 90s, while Canary Wharf, which was newly completed, was also partially empty and facing bankruptcy in 1992. After that unstable phase, the London Docklands have become a world financial hub. (Fig. 1)

Fig. 1. Canary Wharf, London

Fig. 2. Canal in central Birmingham

A special case in the UK is the city of Birmingham, a dynamic center of the British Industrial Revolution in the mid 1700s. At that time, over 200 canals were built by different companies, aiming strategically to connect the city with the rest of England. However, along with the decline of manufactured industry in the 1930s, the canals suffered also functionally and were abandoned. The alluvial deposits, some resulted from the Second World War activities, damaged the canals severely. In 1958, all canals were taken under the administration of British Waterways, a public corporation managing the inland streams of the country. [6]

In 1988, a session of urban regeneration ideas were brought to life and became the foundation of Birmingham Urban Planning Strategy, embodied in a project that focused on the development of urban visual identity at a human scale. The city's control over canals, though modest and deserted, elaborated a system of opened public spaces. The canals' revival was based on functional diversity: apartments facing the water, cultural spaces and conference centers, shops, bars and restaurants. (Fig. 2) Hence, the canals will organize urban spaces and will provide a catalyst for further redevelopments of the city with the ability of extending the waterways system.

III. LANDSCAPE URABNISM – URBAN REGENERATION METHOD

A. Introduction in landscape urbanism

During the last decade, landscape has become a model for contemporary urbanism, a unique formula capable of describing the conditions for radical freestanding urbanization, especially regarding the complex natural environments. In this period, the subject of landscape has embraced cultural and intellectual innovations.

Many conceptual manners and projection practices embodied in landscape urbanism derive from those traditional disciplines responsible for describing the city. Therefore, landscape urbanism criticises the inability of architecture and urban planning to offer coherent, competent and convincing explanations regarding contemporary urban conditions. In this context, the issue of landscape urbanism could be understood as a disciplinary reconstruction in which landscape eliminates the historical role of architecture and comes to be the basis of urban planning. In more than one branch, writers have highlighted the new significance of landscape by relating temporal mutability and horizontal urban expansion. Among the writers that assert the landscape potential in this concern, there is architect Stan Allen, former dean of Princeton University's School of Architecture: "Increasingly, landscape is emerging as a model for urbanism. Landscape has traditionally been defined as the art of organizing horizontal surfaces...By paying close attention to these surface conditions – not only configuration, but also materiality and performance – designers can activate space and produce urban effects without the weighty apparatus of traditional space making." [7]

This ability to produce urban effects that normally are obtained through building and organizing horizontal surfaces, is reflected in the means of landscape used for urban situations marked by fast expansion and changes. In the circumstance of self-sufficiency and density decrease, the urban planning's traditional tool proves to be quite expensive and immutable in relationship with swift transformations of urban contemporary culture.

The idea of landscape as a model for urbanism was also emphasized by landscape architect James Corner, who claims that only through a synthetic and cunning reorganization of built environment one can escape the current dead-end of the post-industrial modernity. [8]

B. Landscape urbanism in the contemporary city

Landscape is a medium, a systematic way able to respond to temporal change, transformation, accomodation and progression. These qualities make landscape the correspondent of modern movement. As Allen declares: "Landscape is not only a formal model for urbanism today, but perhaps more importantly, a model for precess." [7]

Through the development of postmodern ideas for endless eyesight and undetermined condition, Bernard Tschumi's and Rem Koolhass's projects for Parc de la Villette made reference to the role that landscape would play as means of articulating postmodern urbanism : layered, non-hierarchical, flexible and strategic. [9] These landscape urbanism schemes built an horizontal infrastructural field which was capable to include all types of urban activities, planned or not, imagined or not, over time.

Influenced by Parc de la Villette, architecture has become aware of the part that landscape plays for the modern city. Besides design strategies, landscape urbanism provides a cultural framework – lens through which you can see

and describe the city. This tendency is obvious in projects that put together terms, conceptual aspects and operational methodologies belonging to ecology. This fact brings to light one of the landscape urbanism's advantages: blending, integrating and fluid change between natural environment and infrastructural systems.

While landscape architecture is examinating its own historical and theoretical bases, the public is attentive to environmental issues, and thus more attentive to landscape as a cultural field. Many landscape architects have become involved in designing post-industrial sites. Landscape architect Richard Weller defines the new role of landscape:

"Postmodern landscape architecture has done a boom trade in cleaning up after modern infrastructure as societies – in the first world at least – shift from primary industry to post industrial, information societies. In common landscape practice, work is more often than not conducted in the shadow of the infrastructural object, which is given priority over the field into which it is to be inserted. However, as any landscape architect knows, the landscape itself is a medium through which all ecological transactions must pass: it is the infrastructure of the future." [10]

C. Waterfront through landscape urbanism

Landscape's power as method of retrieval – a cure for the wounds of the industrial era – is pointed out in the works of many contemporary architects, who approached the waterfront reconstruction theme. This subject represents an important part of public space development, which has different landscape premises from a country to another.

Waterfronts have become the most controversial sites dedicated to urban contemporary development. During the 19th and the 20th centuries, urban waterfront was an extremely polluted industrial area, a dump for the urban "detritus".

Revitalization projects which have as foundation the iconic and original public space, changing waterfronts into a destination, use different procedures:

- reorganizing relationships between ecology and infrastructure, leaving behind the medium work scale and favouring the infrastructural diagram at a large scale and material conditions at a small scale.
- experimental approach and urban interactive nature which assert the public space importance as pivot of sustainable development, through its civic and social role. (Fig. 3)

Fig. 3. Grand Canal Square, Dublin

Landscape architect James Corner, it his work called "Terra Fluxus", identified the most important keystones of landscape urbanism, which can be seen in most waterfront regeneration projects:

a. horizontality, achieved through a horizontal alignment of landscape, which does not imply the use of vertical structures.

b. unconventional organic infrastructure and infrastructure that focuses on walkability to navigate the space in any direction and to discharge him from traffic with underground parking.

c. matching techniques depending on the environment, in this case waterfronts, where the aim is to create a strong bond between the city and the natural element – water; hence regeneration projects with the help of landscape urbanism have a catalyst function between nature and inhabitant.

d. ecology, the respect shown to the environment.

IV. WATERFRONT REGENERATION OF THE SOMES RIVER : ABATORULUI SQUARE – FEROVIARILOR PARK, CLUJ-NAPOCA

Located in a hollow, Cluj-Napoca City, once the access gate to Apuseni Mountains, has changed its image during the years, going through many urban structural processes and becoming a little metropolis with a modern look laid over the old medieval fabric.

The natural element, meaningful to the local history and also to the urban pattern, is represented by the Somesul Mic River, which crosses the city from West to Est, covering nearly 14 km. In the 19th century, there were carried out corrections of its course and the first bank defences, and at the beginning of the 20th century, building the four upstream lakes brought to the river's discharge adjustment. Although the Somes valley allowed special landscape designs with surfaces of water and waterfalls, the urban regulations didn't aim to make the most of the river.

The same attitude of indifference is manifested also on the Abatorului Square – Feroviarilor Park area, situated on the eastern bank of Somes. This site along with the presence of the water can provide a large range of opportunities from all points of view: economic, cultural, social and environmental. In addition, the land has the ability to become a new focal point in the city, calling forth in time the extension of the central area towards the North and integrating in this way the waterway.

Abatorului Square (Fig. 4), built between 1961 and 1964, is represented nowadays only by the southern urban front constituted of a three storey building and a high-rise building with 12 storeys, figuring a vertical accent, a local landmark that customises the public space. The eastern front, composed by two office buildings belonging to the Slaughter House when it was functional, is now formed by a gas station at the crossroad of Bucharest Street and Anton Pann Street, and by a car showroom on the opposite side, near the Abatorului Bridge. These buildings do not give the necessary consistency to the 140 m long urban front.

The moving out of the Slaughter House has brought to mind a promenade along Somes River in 1989. However these plans to redevelop the site remained only an intention, and the area became derelict, abandoned, and blocks the physical and visual access to the water. Once called "Feroviarilor Garden", the green surface located in the north of the former Slaughter House suffered massive tree clearance and unauthorized works. Though it is the second largest park in the city, Feroviarilor Park does not attract the public anymore, being a shabby site.

Fig. 4. Abatorului Square in the 90s [11]

Therefore, the urban regeneration of this space is built of four essential aspects that need resolution:

1. Designing Abatorului Square as a true urban space with adequate uses, urban furnishings and atmosphere.
2. Developing a new urban pole with mixed functions, creating the continuity of built environment and making the most of the former industrial site.
3. Recovering Feroviarilor Park through efficient usage of the present resource.
4. Waterfront regeneration of Somesul Mic River achieving the water-city connection, highly influencing the three zones mentioned above and offering them a special nature.

The sustainable waterfront development of Somes banks along with Abatorului Square – Feroviarilor Park ensemble would create a positive attitude towards natural environment by facing the city to the water. This operation would have to pursuit the following guidelines:

a. Environment quality and tacitly water quality has to be ensured.

Natural elements quality is an important aspect

for the inhabitants confort and their health. Thereby, to have a sustainable redevelopment of unvalued sites, it is necessary to clean the waterfronts of Somes River, to clean the water and the park as to eliminate the sources of pollution and to improve the environmental quality.

b. Waterfronts are part of the urban fabric.

The waterfront regeneration plans have to reconnect the shores with the city. The resulting waterfront has to offer a better urban space quality and vitality of the city with a vibrant feeling. The relationship betweend water and buildings can be accomplished through:

- visual corridors towards Somes River
- dynamic urban spaces near the water
- promenades along both of the banks with pedestrian and cycling lay-outs

c. Hystorical identity offers the site's character.

The cultural landscape conceived with the natural landscape provides continuity to the urban context. In this case, the main actor is Feroviarilor Park. For a sustainable regeneration are needed the following elemnts:

- keeping the existing vegetation
- keeping the wild feature of this green area
- rebuilding the old pedestrian alleys by using their traces which are still visible
- rebuilding the railway for the children train, which once enlivened the park
- creating a stronger physical and visual connection between Somes River and the park

d. Mixed uses and public access are essential.

The development of buildings on the former Slaughter House enclosure defined by a mixture of functions would favour both the existing building and the suggested ones by dedicating the inferior levels to comerce, services and culture, and the upper levels to residentials. For an intensive use, pedestrian access would be supported by connections with the interior urban areas and the waterfronts, providing better quality to urban spaces. Discharging the urban space from traffic would be possible through an underground parking placed in the eastern half of the site.

e. Regeneration represents an ongoing process.

The urban planning of this area should be flexible, should adapt to changes and integrate all relevant disciplines – urbanism, architecture, design, landscape urbanism, management. To promote a sustainable development of Abatorului Square – Feroviarilor Park area, the new buildings together with the waterfronts should be functional all day long.

V. CONCLUSION

The urban regeneration of the entire studied site (Fig. 5) could have the following assets:

- the increase in real estate property values through opportunities of implementing new uses and activities;
- economic investment support to derelict areas;
- the provision with new residentials, new jobs and high quality services;
- the improvement of the city's image leading to accurate marketing strategies;
- the preservation of genius loci regarding historical heritage;
- creating a strog connection between water and the city;
- the improvement of water and environmental quality by means of ecologic processes.

Moreover, waterfront revitalization of the Somes River will guide the acces to the natural element on three levels: water-city connection, waterfront continuity and water-waterfront relationship.

Therefore, Abatorului Square – Feroviarilor Park development will be able to fill the axis of focal points in Cluj-Napoca and the recreation area flow on the Somesul Mic River. [11]

Fig. 5. Abatorului Square – Feroviarilor Park in 2014

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