ACE Architecture, City and Environment

E-ISSN 1886-4805

Hybrid Housing as the Answer to the Changing Needs of Contemporary Society

Mateusz Gyurkovich [1]

Received: 2020-05-20 | Final version: 2021-11-21

Abstract

The roots of *hybrid* in architecture are connected to the post-modern negation of modernism and functionalist division of the cities. As a product of the contemporary culture, architectural and urban hybrid is based on the mixing of structures, spatial programs, and functions in different scales. What defines and make them special in the urban fabric is that the overlapping of inner and outer spaces in unparalleled way. The methodology of the research is based on literature studies and the analysis of built examples in Europe. This base helped to develop the "design laboratory" in which, together with students, the possibilities of implementing hybrid urban structures with housing were checked in different conditions around the globe. The study brings out the positive examples of hybrid urban structures with the new typology of housing within the dense urban fabric. The examples differ. Starting from the masterpieces of modern movement, through structures from last decades and finishing with the few of student's projects elaborated under the supervision of the author using "checking by design" method. The results of the research prove that the hybrids seem to be the perfect answer to the contemporary spatial problems of cities. Hybrids could help to minimalize the urban sprawl, proposing attractive alternatives of housing models. At the same time, they respond to the needs of contemporary society by innovations and better standards. They can also help to build the affordable apartments in the privilege, central locations of cities and towns, which could be crucial in post-pandemic times.

Keywords: Housing environment; contemporary city; hybrid urban structure; housing typology

Citation

Gyurkovich, M. (2022). Hybrid Housing as the Answer to the Changing Needs of Contemporary Society. *ACE: Architecture, City and Environment*, *16*(48), 9328. DOI: http://dx.doi.org/10.5821/ace.16.48.9328

La vivienda híbrida como respuesta a las necesidades cambiantes de la sociedad contemporánea

Resumen

Las raíces de la arquitectura híbrida están conectadas con la negación posmoderna del modernismo y la división funcionalista de las ciudades. Como producto de la cultura contemporánea, el híbrido arquitectónico y urbano se basa en la mezcla de estructuras, programas espaciales y funciones en diferentes escalas. Lo que los define y los hace especiales en el tejido urbano es la superposición de espacios interiores y exteriores de forma inigualable. La metodología de la investigación se basa en estudios bibliográficos y el análisis de ejemplos construidos en Europa. Esta base ayudó a desarrollar el "laboratorio de diseño" en el que, junto con los estudiantes, se comprobaron las posibilidades de implementar estructuras urbanas híbridas con vivienda en diferentes condiciones alrededor del mundo. El estudio destaca los ejemplos positivos de estructuras urbanas híbridas con la nueva tipología de vivienda dentro del tejido urbano denso. Los ejemplos difieren. Partiendo de las obras maestras del movimiento moderno, pasando por estructuras de las últimas décadas y terminando con algunos proyectos de estudiantes elaborados bajo la supervisión del autor utilizando el método de "comprobación por diseño". Los resultados de la investigación prueban que los híbridos parecen ser la respuesta perfecta a los problemas espaciales contemporáneos de las ciudades. Los híbridos podrían ayudar a minimizar la expansión urbana, proponiendo alternativas atractivas de modelos de vivienda. Al mismo tiempo, responden a las necesidades de la sociedad contemporánea mediante innovaciones y mejores estándares. También pueden ayudar a construir apartamentos asequibles en ubicaciones privilegiadas y centrales de ciudades y pueblos, lo que podría ser crucial en tiempos posteriores a la pandemia.

Palabras clave: Entorno de la vivienda; ciudad contemporánea; estructura urbana híbrida; tipología de vivienda

[1] Prof., D.Sc. Ph.D. Eng. Arch. Mateusz Gyurkovich, Chair of Urbanism and City Structure Architecture, Faculty of Architecture, Cracow University of Technology, (ORCiD: 0000-0002-6685-5234, Wos ResearcherID: 2230027). Contact e-mail: mateusz.gyurkovich@pk.edu.pl

E-ISSN 1886-4805

1. Introduction to the issue of hybrids in architecture and urbanism

The recent quarter of a century have seen the worldwide establishment of the term hybrid in the terminology of architecture and urbanism (Gyurkovich, 2013; Gyurkovich *et al.* 2016). This notion, which derives from Latin, was firstly adopted by natural sciences. To understand it well in urban planning and architecture, it is necessary to evoke hybrid also in the understanding of linguistics, where is stands for a word that consists of elements which belong to two different languages (*Encyklopedia PWN- źródło wiarygodnej i rzetelnej wiedzy,*n.d-a). The term hybrid, adopted in natural sciences ages ago, signifies a crossbred specimen that came into being because of crossbreeding of two genetically different parental forms (Encyclopedia Britannica, 2012; *Encyklopedia PWN- źródło wiarygodnej i rzetelnej wiedzy, 2012*). In very numerous hybrids a phenomenon of heterosis has been observed, which is responsible for the fact that they can be perceived as more attractive than the initial forms in many ways.

The heterosis of the biological hybrids (heterosis [Greek: hetérōsis 'transforming'], exuberance of crossbreds, biol. Phenomenon of increased vitality and abundance -compared to the parental forms- occurring in crossbreds- (*Encyklopedia PWN- źródło wiarygodnej i rzetelnej wiedzy, 2012*) is largely used in contemporary medicine and agriculture, especially today, in the age of genetic modifications. Hybrids in mythologies and heraldry are understood in the same context; invented creatures, such as centaurs, gryphons, Sphynx, or Chimera – they are hybrids, consisting of parts of other well-known animals. The combination of such parts produced a creature with extraordinary powers, often even invincible. In the contemporary times the term hybrid is widely and often used by other fields of knowledge, science, and production, including technical sciences. Hybrid technical system is understood as such in which at least two other different systems have been combined. Together, however, they form a new structure, which makes use of and enhances the most positive and useful features of the initial elements.

The fact that the term hybrid was adopted by the science devoted to architecture and urban planning was a natural consequence of the negation of modernism, most of all its planning concepts which introduced the functional zoning. Thus, one can say, that the roots of the process are strongly connected with the postmodernist slogans of a return to the multi-functional compact urban tissue from the turn of the 1960s. Social expectations and requirements relating to urban structures and complexes implemented and revitalized in metropolises, also the European ones constantly change (Baumann, 1998). This relates to both ethnic and cultural diversity of their users, and the development of civilization and technology, implying the change of the post-industrial society into the information society (Palej, 2019). Thanks to the technological progress, futuristic (also from the social point of view) visions of Archigram or Paolo Soleri and other architectural visionaries of 20th century, have become possible to be implemented in practice by anyone and everywhere. In consequence, they have resulted in the creation of new unique urban structures, both in the macro and micro scale, which could be named as hybrid spaces or hybrid structures (Gyurkovich *et al.,* 2016).

Some researchers cooperating with IAAC in Barcelona, look for the sources of the phenomenon of hybridization in architecture and urbanism (Gausa *et al*., 2003) in the coexistence of the realistic and virtual words. In fact, it seems that the development of virtual architecture, Including the early research and creative experiments of Gregg Lynn and Dagmar Richter (Zellner, 2000), has contributed to bringing architecture and biological sciences together. This is enhanced by technical solutions that enable to design architectural and engineering structures of oval forms, never encountered before, which appeared at the end of the previous century and have been constantly perfected. Among such terms as biomorphism and folding, there also appeared the term hybrid, applied with reference to individual structures, as well as parts of a city. Initially, it occurred only in the context of a contact point of the virtual space and the physical space.

E-ISSN 1886-4805

According to some statements, the product of coexistence of these parallel worlds could be no longer consistent and compact, as known from the previous historical epochs, but its forms should be basing on the mixture of scenarios of use and spatial structures – they should be crossbreds, or hybrids (Gausa *et al*., 2003) now, believes that hybrids have existed since the dawn of architecture: ...as a merchant's house with shop and livable space in ancient Greece is already a hybrid (after: Steven Holl, Prologue, in: Fernández-Per *et al*., 2011). However, it seems to be too general a statement, even taking in account, that Holl was probably the first, who used the term *"hybrid"* in the context of architecture (Holl & Fenton, 1985). Following Koolhaas (Koolhaas, 1997) in his belief that the appearance of edifices and structures of a hybrid nature resulted from the need caused by the spatial and economic conditions of dynamically developing cities of the turn of the 19th and 20th centuries seems to be much more accurate. The skyscraper - vertical, horizontal or spatial - defined by Koolhaas, where the typologies, orders, and functional systems known so far have been blended, obtaining a totally new quality unknown before, could be also understood as a hybrid. It creates unique spatial relations between an urban structure of the city and the building. Even entire cities and towns can be perceived as hybrids from very different points of views (Franta, 2019a). In larger picture: as a combination of different natural and man-made systems, cooperating in forming the natural environment of contemporary human beings (Gyurkovich, 2013; Gyurkovich *et al.,* 2016). They are also hybrids as a patchwork of different building structures which all seems to create one, coherent urban tissue.

Architectural hybrids can be understood in many ways: predominantly as functional hybrids; structures consisting of various structural and spatial systems (including the ones which present diversified styles; historical and contemporary ones); as well as structures whose interiors can intermingle and combine with the public space of the city (Fernández-Per *et al*., 2011). Therefore, the term *hybrids* can be used not only to the single buildings, but also to the complexes of various sizes, as well as parts of the urban or metropolitan space of different scales. *Hybrid spaces and structures, unlike mono-functional structures and urban public spaces understood in the traditional way, or the multi-functional structures encountered so far, offer much richer sensations. They result not only from a simple sum of numerous functions and elements of the programme. Following the principles of synergy, they create completely new spatial and functional relations, never encountered before. In doing so, they enable users to undertake new activities. And in this respect the architectural and urban notion of a hybrid gets closer to its biological and mythological prototype* (Gyurkovich *et al*., 2016).

Based on long-term research (presented in more than 20 publications in the years 2009-2019), the author is convinced that the heterosis of hybrids is present in architecture and urbanism, as well. Hybrid spaces and structures are much better at addressing the needs of contemporary urban societies, communities of the information age, at the same time allowing them to indulge and pursue their whims (Baumann, 1998) and to undertake many activities. Their constant changeability, which is partly generated directly by users, and partly stimulated by designers, and to a certain extent also the contemporary smart technologies and computer software, is also important in this respect. In hybrid spaces and structures the virtual reality has its constantly increasing effect on the physical structure of a metropolis (Gyurkovich *et al.,* 2016).

2. Hybrid structures within towns and cities

The paradigm of the contemporary city, city of 21st century is still one of the most discussed issues among the architects, urban planners, and the specialists of different fields all over the world (Rogers, 1997; Kriken *et al*., 2010; Bullivant, 2012; Nan, 2013; Roca Cladera *et al*., 2016; Kosiński, 2016; Rose, 2017). Up till now nobody really knows if we need to deal more with eco-cities, smart-cities, dense-cities, or resilient ones.

E-ISSN 1886-4805

Or is it possible that it all should be combined in one? The traditional typologies of urban buildings and complexes are changing and evolving constantly, also thanks to technological possibilities (Kobylarczyk & Dobrowolski, 2019) producing new forms and structures, unknown before (Phaidon, 2008; Avermaete *et al*. Eds., 2009; Klanten *et al*., 2012; Gerber *et al*., 2013). Some of them could be named hybrid.

At present, the reasons for the establishment of urban hybrid structures are like the ones that occurred in the beginning of previous century. Fernández-Per *et al*., 2011, whose publications, apart from what has been mentioned above, appear to be fundamental concerning the theory of *hybridization*, believe that *hybrids* in architecture and urban planning can come into being exclusively in dense urban tissue (Fernández-Per *et al*., 2011), which confirms the previous observations made by Koolhaas. After almost a decade after their publication and more than two decades after the cited book of Koolhaas (Koolhaas, 1997), one may say, that predominantly they are placed in the centres of cities and towns, but not only, and moreover- it never has been a main rule or major determinant of hybrid structure (Gyurkovich *et al.,* 2016; Gyurkovich & Sotoca, 2019). The need to prevent ongoing exurbanisation, which clearly results from the principles of sustainable development, (Schneider-Skalska & Kusińska, 2017; Włoch-Szymla, 2019) implies the need for rational management of land that was once urbanised. Numerous urban regeneration strategies, which have been the subject matter of many manifestoes, scientific papers and books have recently appeared (Healy, 2007; Eisinger & Seifert, 2012; Gyurkovich, 2012; 2013; Hofert, 2014). Different types of hybrids have already been built in revitalised areas of cities and towns worldwide.

2.1 Hybrid urban housing – European examples

Housing, as the leading form of use in urbanised areas, has for many decades been the subject of continuous transformation, perfecting and experimentation, which has also manifested itself in numerous publications (Fernández-Per *et al*., 2007; Seruga, 2014; Gyurkovich & Sotoca, 2019; Poklewski-Koziełł, 2018) as well as urban planning manifestoes that have been published since the beginning of the twentieth century. For almost a century, after proclaiming the modern movement, most of the multifamily housing has been built in European cities as housing estates with total separation of functions and in some cases, this still happens (Dudzic-Gyurkovich, 2018), which effects various spacial and social problems.

Nowadays numerous research and revitalization programmes has been introduced to investigate and cure the situation (Cervero Sánchez, 2020; Diaz *et al*., 2019), sometimes with opposite results (Szczerek, 2019). The problem of the multi-functionality of urban structures and the variety of the housing environment that has been particularly present since the 1960's (Avermaete *et al*. Eds., 2009) is often featured in the latter. Along with the bringing up of important social matters, particularly by modernists, they have set the course for changes in thinking about architecture and urban planning. The evolution of philosophical views and currents, architectural styles, technological possibilities and concepts, as well as social utopias bordering on totalitarianism, followed by their negation, caused - as a result - the emergence of a globalised culture at the start of the current century, which has produced unified architectural forms and in a wider context - global cities (Sassen, 2001). These changes have inadvertently led to the emergence of today's housing hybrids, which are being built all over the world.

Nevertheless, it was already Le Corbusier's machine for living, and especially its most perfect exemplification - *Unité d'Habitation* - that became one of the first, but definitely best known, example of a housing hybrid. The building in Marseille (Figure 1) was built in the years 1947-1952 and contains 337 housing units meant for around 1600 residents. The varied apartment structure (with 23 types) was meant for different kinds of users from all social classes.

E-ISSN 1886-4805

The internal street on the seventh and eighth floor, featuring shops and services, enriched the functional programme, in addition to creating an equivalent of a traditional public space of the street within the building. A similar role was played by the terrace on the roof, which according to the rules formulated earlier by Le Corbusier was devoted for the use of inhabitants of the unit, featuring small structures for a kindergarten and a sports centre (Cohen, 2009).

In a typological sense, it was of course a reference to the American skyscrapers from the start of the twentieth century which fascinated le Corbusier (and would later come to fascinate Koolhaas). This one was, however, stripped of their decorative, eclectic decoration and kept in a rational modernist aesthetic. The mix of functions, as well as private and social spaces that was used in the structure, undeniably places it among the precursors of contemporary housing hybrids, although some see it just as a "social condenser" on the opposite side of the scale, probably just because it has been surrounded by a greenery and not build within dense urban fabric (Fernández-Per *et al*., 2011).

Figure 1. *Unite d'Habitation* in Marseille

Source: Photo by T. Węcławowicz.

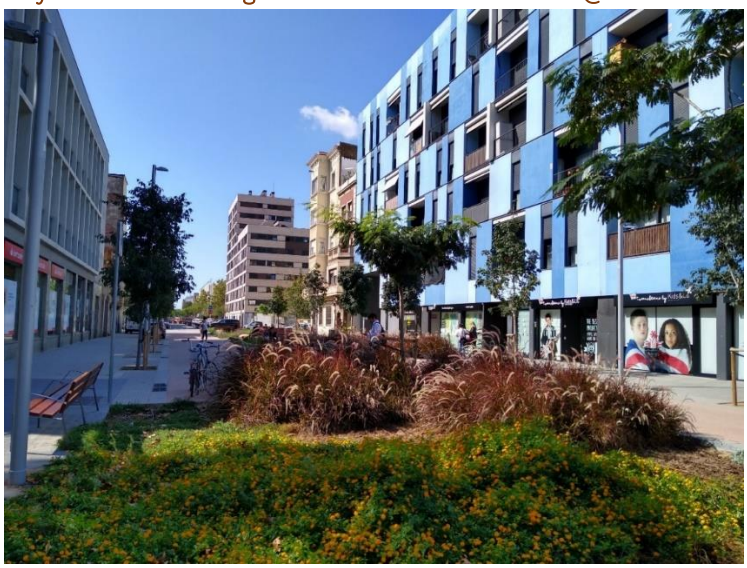
In more contemporary times, numerous built projects featuring new housing complexes, particularly in European cities, have been built as a result of urban regeneration programmes, following a trend of restoring lost urban areas - post-industrial ones or that had previously been used by transport or the military - for use by cities. Various urban regeneration programmes have been implemented in almost every major city in Europe (and in many minor ones) for over a quarter of a century, most often introducing residential forms of use into areas of former brownfields. A particularly strong emphasis was placed on this aspect in the *22@* programme, which was implemented in Barcelona's post-industrial district of El Poblenou in the years 2000-2011. Hybrid structures and complexes (especially in functional terms) were being given many forms of preferred treatment in terms of financing, taxation, rules concerning access to the latest infrastructure and the promotion of development projects in municipal and regional media outlets (Peremiquel *et al*., 2009; López, A., (2011); Gyurkovich, 2012). Some of the principles of the programme are still being implemented in Barcelona, despite its slowdown, which was followed by termination due to the consequences of the economic crisis of 2008 that affected the world and Spain in particular.

E-ISSN 1886-4805

Many of the housing complexes built in El Poblenou are strictly tied with other functions (mainly office, social and educational spaces), with local legislation requiring that each newly built complex is to contain a certain number of subsidised and social housing apartments (Figure 2). Similar implementations have been introduced also in other districts of Barcelona (Figure 3). This policy ensures that the destitute have access to structures and recreational social spaces built to a high standard, equally to the more privileged social strata.

Years later it appears that the principle of social equality that was propagated by the first modernists is still being implemented there and the social closeness to different element of functional programme of the district could be understood as an advantage also in the times of plagues and in post-COVID society.

Figure 2. Hybrid social housing - *Edifici Blau* in revitalized 22@ district in Barcelona



Source: Photo by author.

Figure 3. Hybrid complex with housing, school and kindergarden (by J.Coll, J. Leclerc) built in 2001 at c/ Londres in Barcelona

Source: Photo by author.

E-ISSN 1886-4805

Since we can consider structures composed of layered historical and contemporary elements also as hybrids (Fernández-Per *et al*., 2007; 2011; Gyurkovich, 2013; Gyurkovich *et al.* 2016), a particularly high number of these types of structures and complexes is appearing constantly within European cities.

Not all of them are equipped with housing functions. Sometimes, even when they are, they are usually luxurious apartments (Gyurkovich & Sotoca, 2019), which are not easily accessible to the average citizen. Regardless, cases in which hybrid structures and complexes constitute an interesting housing offering in fashionable, downtown built projects, aimed at the poorer strata of society can be observed (Poklewski-Koziełł, 2018). Apart from the Spanish built projects that have been mentioned, one of the more interesting examples of these types of complexes is *Smithfield Village* in Dublin, whose authors were Polish architects who have been operating in Ireland for several decades - Danuta and Andrzej Wejchert (*Wejchert Architects,* 2007).

Its dense urban tissue, full of picturesque alleys, small squares or narrow pedestrian streets was built in the years 1991-1997 as a part of a single, grand urban block, constrained by the former walls of a whiskey distillery. As a part of the urban regeneration design, a portion of the post-industrial structures were adapted for residential use, with others featuring offices and a museum presenting the operation of and production within the former factory, along with a tasting space, which is frequented by crowds of tourists. The evidently post-modern, industrial style of the complex does not operate using obtrusive historical references. The multi-family residential complex also includes a hotel, a small education centre, shops and services. A panoramic viewing platform, sheltered from the wind and rain, has been placed on the former factory smokestack, from which we can view not only the complex and the nearby Smithfield Square, but also the entire city. Varied in terms of typology, standard and apartment floor area, accessible through nine stairwells and elevators, as well as (sometimes) elaborate gallery layouts, it has been assigned for use various users.

This hybrid complex (Figures 4, 5) has undeniably been a catalyst for later changes in the immediate vicinity and has led to perceiving the site of the old (and still operating on some days) horse market as an attractive public space in the downtown area of the Irish capital.

Figure 4. Hybrid complex with housing – *Smithfield Village* in Dublin

Source: Photo by author.

ACE, 16 (48) CC BY-ND 3.0 ES | UPC Barcelona, España | Hybrid Housing as the Answer to the Changing Needs of Contemporary Society. DOI: http://dx.doi.org/10.5821/ace.16.48.9328

E-ISSN 1886-4805

Figure 5. *Smithfield Village* in Dublin – view from the chimney to the structure of the complex

Source: Photo by author.

2.2 *The future of the hybrids- didactic perspective*

The most spectacular examples of hybrid housing structures are, of course, being built in the rapidly developing cities of the Middle and Far East. However, in those places the targets of these solutions are primarily the most affluent social strata. Apartments in hybrid complexes designed by Rem Koolhaas in Singapore or Steven Holl in Beijing are among the most luxurious and prestigious. However, it appears that urban regeneration programmes in European cities are currently becoming an opportunity for making hybrid housing structures and complexes more common (Schneider-Skalska & Kusińska, 2017; Seruga, 2014; Gyurkovich *et al.,* 2016).

Espousing this belief, we have been implementing at the Institute of Urban Design of the Faculty of Architecture of Cracow University of Technology didactic programmes familiarising students with these problems for almost a decade (Schneider-Skalska, 2018). During classes at the Master's in architecture in English course, as a part of Design Module I which has been taught with the participation of visiting professors from ETSAB UPC in Barcelona, Politecnico di Milano and Tekska Universitat in Lulea, students design hybrid complexes with the use of typologically varied apartments (including co-housing, student dormitories or apartments for families with varying floor area and standard).

They are usually elements of larger urban regeneration projects implemented in numerous Polish, Spanish (Figures 6, 7), Italian (Franta, 2019b) and Swedish towns and cities. More and more often such topics also appear as Bachelor or Master diploma projects, lately even at the regular design studios (at both stages of architectural education), which has been developed under the supervision of the author. In that way the students were involved in the research programmes conducted by the author of the article and his team. The design studios have begun a kind of laboratory in which the architects-scientists, together with their younger colleagues were able to use the "*check by design"* methodology to prove or refute their theories. In some examples it has brought very interesting results.

E-ISSN 1886-4805

Figure 6. Urban Hybrid with multifamily housing in *El Poblenou* district in Barcelona

Source: Drawings of the project by W. Orłowski.
Note: Student' s project of 2015 Master in Architecture Module I Studio at FA CUT (guidance by the author)

Figure 7. Urban Hybrid with multifamily housing in *El Poblenou* district in Barcelona

Source: Drawings of the project by T. Rejowski.
Note: Student' s project of 2015 Master's in Architecture Module I Studio at FA CUT (guidance by the author).

The bachelor diploma project prepared under the guidance of the author (with collaboration of Prof. K. Racoń-Leja) which was presented in February 2016, was devoted to the topic of *Hybrid Megastructure*. The Megastructure (Figure 8), placed in one of most important, yet still not finished until now (May 2020) communication nodes of the city of Cracow in the area of south Żabiniec district was quite an impressive design. The proximity of the inner-city, as well as main train and bus stations, several hospitals and universities at the border of large residential areas developed since 1970s, makes the place very interesting for investors. Numerous plans of development of the area were made during last decades, including the proposition of creating a large vehicular road, which would close the so called "second ring" (Racoń-Leja, 2016) of Cracow.

ACE, 16 (48) CC BY-ND 3.0 ES | UPC Barcelona, España | Hybrid Housing as the Answer to the Changing Needs of Contemporary Society. DOI: http://dx.doi.org/10.5821/ace.16.48.9328

E-ISSN 1886-4805

The idea was rejected after few years, although the undeveloped reserve of land, which was untouched thanks to its post-military history, dated back to the mid-19th century and Austrian occupation of the city, and remained. The *Megastructure* itself was a part of the renewal project of the entire area. It housed commercial and office spaces, apartments and hotel, arranging and controlling the flow of users at the same time. The major functions were combined with the small train station, tram stop, underground parking and a road beneath. Various public spaces, some evoking connotations with the narrow streets of the inner-city of Cracow, others reminding spacious gardens, were designed on different levels of the structure. Two towers served as dominants for the whole futuristic district. Raised public space is linked with surrounding areas through footbridges, which cross over new developments and take the form of a giant urban "SPIDER". The megastructure, through merging two completely different urban strategies (dense commercial development and small buildings scattered in green public space), has the advantages of both and uses the space in the most efficient way (Bijak, 2016). Such an idea was thought like an answer to the needs of contemporary society.

Similar ideas yet solved in much bigger scale have appeared in two master thesis projects prepared under the guidance of the author in 2016 and 2017 for different locations in Singapore. The scale, climatic conditions and the problems of the global metropolis were of course much different from the cracovian case. Two, quite huge sites in densely built state-city were able to house various functional and spatial programme.

Figure 8. Hybrid Megastructure in Cracow

Source: Drawings of the project by A. Bijak.
Note: 2016 bachelor diploma project at FA CUT (guidance by M. Gyurkovich & K. Racoń-Leja).

E-ISSN 1886-4805

In both cases, the authors of the thesis design (Tomasz Rejowski and Marlena Prost who designed Megastructure Skybridge; Wisz Orłowski designed *Mixed Use Neighbourhood Singapore-Queenstown-Dover*) decided that the hybrid structure will be the best to fulfil the needs of vibrant metropolis. To save as much of the natural resources of the sites, which was the tropical ecosystem, but at the same time establish a connection with the densely built neighbouring districts, both thesis projects took a form of a hybrid complex built of tall buildings, linked with other structures on different levels. The percentage of multifamily housing within both of them varied a lot. *Megastructure Skybridge* (Rejowski & Prost, 2016), situated in a post-industrial zone of the city was predominantly office space and technology park, with some amount of mostly luxurious apartments in few towers (Figure 9).

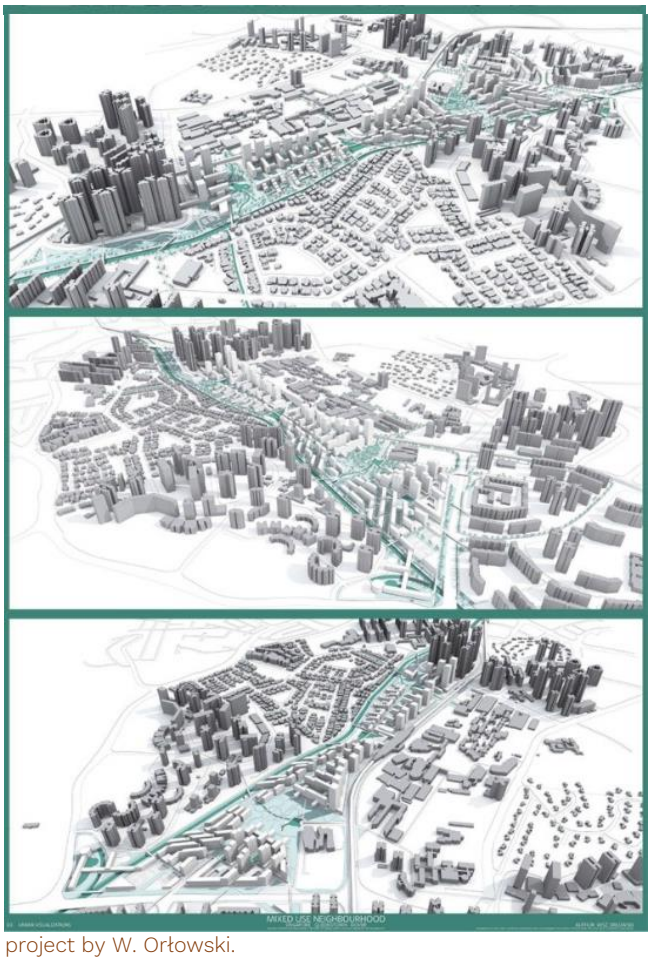
The design of *Mixed-Use Neighbourhood* was placed along small stream-canyon with tropical vegetation and vibrant animal life, in the middle of metropolis in Queenstown-Dover district of Singapore. The diplomant decided to create a clear, yet perforated boundary between the natural landscape of the valley and the heavy traffic road and railway line, which were going along it and divided it from the rest of the district. The set of residential towers, equipped with different typology of social and commercial flats were solved with many technological systems which helped to build zero-energy complex (Figure 10). The various accompanied functions (from commercial, offices, retail, education, and sport, to name the basic ones) were housed within few-storey high platform which were linked entire complex into one hybrid structure, giving the controlled openings towards tropical forest in the valley (Orłowski, 2017).

Figure 9. **Master diploma project elaborated at FA CUT for Singapore**

Source: Drawings of the project by M. Prost & T. Rejowski.
Note: Megastructure Skybridge – 2016 (guidance by the author).

E-ISSN 1886-4805

Figure 10. **Master diploma project elaborated at FA CUT for Singapore**



Source: Drawings of the project by W. Orłowski.
Note: Mixed Use Neighbourhood Queenstown - Dover – 2017 (guidance by the author).

The recent design, elaborated by the team of students from 6th semester of the bachelor studies at the Institute of Urban Design at Faculty of Architecture CUT in May 2020, under the guidance of the author, was devoted to the urban regeneration of the neglected area between the prefabricated housing estate from 1970s and the railway tracks in the northern part of Cracow. The main idea was the creation of pedestrian-friendly hybrid complex, which could become the centre of the district according to the polycentric structure of Cracow (Gyurkovich *et al.*, 2017).

Designing in the time of COVID-19 pandemic, has resulted with implementation of wider sidewalks and bicycle routes divided with various compositions of greenery, which will help to preserve the required social distances and in the same time help reduce "the heat island" which the city has turned into, thanks to enormous climate changes in Poland. The hybridization of multifamily residential function was implemented by introducing various typology of apartments (student housing, cohousing, social flats, and commercial flats) on the higher floors of each of the newly proposed buildings within entire complex (Figure 11).

Below them future and existing residents will find a variety of functions (Figure 12) - from education, sports, retail, offices, and culture, since part of the complex were devoted to house new campus of the artistic universities of Cracow (Plata *et al.*, 2020).

ACE, 16 (48) CC BY-ND 3.0 ES | UPC Barcelona, España | Hybrid Housing as the Answer to the Changing Needs of Contemporary Society. DOI: http://dx.doi.org/10.5821/ace.16.48.9328

E-ISSN 1886-4805

Figure 11. Urban regeneration of the area along *Wybickiego* street in Cracow

Source: Drawings of the project by A. Plata, W. Płatek & P. Piecuch.

Note: Elaborated at 2020 6th semester urban design studio of FA CUT, masterplan (guidance by the author).

Figure 12. Urban regeneration of the area along *Wybickiego* street in Cracow

Source: Drawings of the project by A. Plata, W. Płatek & P. Piecuch.

Note: Elaborated at 2020 6th semester urban design studio of FA CUT, axonometric view (guidance buy the author).

ACE, 16 (48) CC BY-ND 3.0 ES | UPC Barcelona, España | Hybrid Housing as the Answer to the Changing Needs of Contemporary Society. DOI: http://dx.doi.org/10.5821/ace.16.48.9328

E-ISSN 1886-4805

3. Conclusions

According to the precepts of sustainable development, we need to minimalize the process of urban sprawl, which is particularly dangerous for the identity of European towns and cities (EEA, 2006), which have developed throughout centuries, or even millennia. The results of the reaserch have shown that hybrid urban structures, which predominantly feature multi-family housing forms of use are the perfect answer to the numerous problems of contemporary city and society. They can be helpful solving problems related to different natural and men-made disasters, as well as the economic crisis deriving from them. Hybrid urban structures, especially the ones equipped with the functions of multifamily housing can help minimalizing the unnecessary flow of people creating "walking-distance districts" or even entire towns (Frumkin *et al*., 2004). From commuting, through environmental protection, creation of varied typology of public spaces helping to achieve proper social distancing, hybrid housing could become a refuge within dense urban fabric and an alternative to the exploding suburbs. *"Concentration of people is (...) a good principle in dealing with climate change, by saving on infrastructure resources"* (Sennet, 2020 after: Paciorek M. *et al*., 2021 p.1). Despite the latest experiences with pandemic, it seems to be, that the appropriate density of the mixed-use urban housing environment can be good for make the cities resilient (Fang & Wahba, 2020). If it even cannot help fighting with the pandemic-itself, then it certainly can help solve the expected post-pandemic economic and social crisis much better than the sprawled urban structures, which are much more expensive in use. They simultaneously respond to the contemporary needs of citizens and may provide affordable apartments in the privileged, downtown areas of European cities and towns. Starting from the works of the masters of the modern movement, through more contemporary structures from recent decades, we can observe their evolution. It appears that teaching future architects the principles of designing hybrid urban structures and buildings, with particular emphasis on maintaining the function of apartments, can lead to a better use of urban resources in the future, one that will be simultaneously more sensitive to the needs of different social groups in the hard, post-pandemic times.

Acknowledgments

The author would like to express his gratitude to prof. Tomasz Węcławowicz for the photos from Marseille, to his former diplomants, architects: Anna Bijak, Tomasz Rejowski, Marlena Prost and Wisz Orłowski, as well as to students of FA CUT: Agnieszka Plata, Weronika Platek and Przemysław Piecuch for the possibility of using illustrations of their projects prepared under the guidance of the author (in the period 2015-2020) in this article.

Author Contributions

The entire work was on Mateusz Gyurkovich.

Bibliography

Avermaete, T., Havik, K., Teerds, P. (2009), *Architectural Positions. Architecture, Modernity and the Public Sphere,* Amsterdam, The Netherlands: SUN Publishers.

Bauman, Z. (1998). *Globalization: The Human Consequences*. Columbia University Press.

Bijak A. (2016). *Hybrid Megastructure in Cracow,* (Bachelor thesis project), Institute of Urban Design Cracow University of Technology.

E-ISSN 1886-4805

Bullivant, L., (2012) *Masterplanning Futures*, Oxon - New York, USA: Routledge.

Peremiquel, F., Quirós, M., Rogent, J., Romeo, B., Rubert de Ventós, M., Sabaté, J., Sanz, H., Vargas, J., Cormenzana, B., Font, R., Palomar, A., Moreno, A., Vilaubi, L., Parcerisa, J., Moreno, J., Rueda, S., Busquets, J., Bages,J., Castiñeira, I., Corominas, M., *et al*., (2009), *Cerdà and the Barcelona of the Future. Reality versus project*. Barcelona, CCCB.

Cervero Sánchez, N. (2020). La envolvente en la rehabilitación de conjuntos de vivienda protegida, *ACE: Architecture, City and Environment*, 14(42), 8960. DOI: http://dx.doi.org/10.5821/ace.14.42.8960

Cohen, J.L. (2009). *Le Corbusier 1887-1965, The Lyricism of Architecture in the Machine Age,* Koln, Germany: Taschen.

Diaz, C.; Coronadó, C.; Vima-Grau, S.; Ravetllat, P. J.; Garcia-Almirall, P. (2019), Intervenciones de rehabilitación en grandes conjuntos habitacionales construidos durante el periodo 1950-1975. *ACE: Architecture, City and Environment*, 14(41), 11-34. DOI: https://doi.org/10.5821/ace.14.41.6538

Dudzic-Gyurkovich, K. (2018), Effect of accessibility in housing complexes on shaping of beauty in the urban environment. Selected examples from Cracow, *Teka Commission of Architecture, Urban Planning and Landscape Studies,* Polish Academy of Science Branch Lublin, vol. XIV/ 1, pp.116-125.

Eisinger, A. & Seifert, J. (2012). *urbanRESET: Freilegen immanenter Potenziale städtischer Räume/How to Activate Immanent Potentials of Urban Spaces*. Berlin, Boston, Germany/USA: Birkhäuser. DOI: https://doi.org/10.1515/9783034610377

Encyclopedia Britannica. (2012). *Hybrid | genetics*. https://www.britannica.com/science/hybrid

Encyklopedia PWN - źródło wiarygodnej i rzetelnej wiedzy. (2012). *PWN*. Retrieved from https://encyklopedia.pwn.pl/lista/a.html

European Environment Agency (EEA). (2006). *Urban sprawl in Europe - The ignored challenge*. EEA REPORT no. 10/2006. European Commission, Directorate-General, Joint Research Centre. Retrieved from https://www.eea.europa.eu/publications/eea_report_2006_10/eea_report_10_2006.pdf/view

Fang, W., Wahba, S. (2020), Urban Density is Not an Enemy in the Coronavirus Fight: Evidence from China, *Sustainable Cities* – published online 20.04.2020 https://blogs.worldbank.org/sustainablecities/

Fernández-Per, A., Mozas J., Arpa J. (2007). *D Book, Density, Data, Diagrams, Dwellings, A Visual Analysis of 64 Collective Housing Projects*, Vitoria- Gasteiz, a+t editions.

Fernández-Per, A., Mozas J., Arpa J., Holl, S. (2011). *This is Hybrid, An analysis of mixed-use buildings by a+t*, Vitoria- Gasteiz, a+t editions.

Franta, A. (2019a), Myths and realities of adaptable city. Contemporary city as adaptable hybrid, *IOP Conf. Ser.: Mater. Sci. Eng.,* Vol.471, 092030. DOI: https://doi.org/10.1088/1757-899X/471/9/092030

Franta, A. (2019b), Ragusa – a 'Lab City' for investigating the possibility of advancement in cohesion and expression of the urban and architectural structure, *Housing Environment,* 29, 60-72. DOI: https://doi.org/10.4467/25438700SM.19.042.11673

Frumkin, H., Frank, L., Jackson, R. (2004), *Urban Sprawl and Public Health: Designing, Planning, and Building for Healthy Communities,* Washington D.C., USA: Island Press.

Gausa, M., Guallart, V., Müller, W., Soriano, F., Porras, F., Morales, J. (2003) *The Metapolis Dictionary of Advanced Architecture. City, Technology and Society in the Information Age*, Barcelona, Spain: ACTAR.

E-ISSN 1886-4805

Gerber, A., Patterson, B. (Eds.). (2013), *Metamorphs in Architecture and Urbanism, An Introduction,* Bielefeld, Germany: transcript Verlag. DOI: https://doi.org/10.14361/transcript.9783839423721

Gyurkovich, M. (2012) 22@Barcelona - The City of Knowledge Civilization, *Technical Transactions, Series Architecture,* 4A (year 109), 25-56.

Gyurkovich, M. (2013), *Hybrydowe przestrzenie kultury we współczesnym mieście europejskim*, Kraków, Poland: Wydawnictwo Politechniki Krakowskiej.

Gyurkovich, M., Homiński, B., Twardowski, M., Woźniak-Szpakiewicz, E., Dudzic-Gyurkovich, K., Franta, J., Matusik, A., Suchoń, F. (2016), *Hybrid Urban Structures*, Kraków, Poland: Wydawnictwo Politechniki Krakowskiej.

Gyurkovich, M., Szarata A., Zuziak, Z.K. (2017), Model Przestrzennej Struktury Krakowa. Perspektwa planistyczna. Etap II – Zdefiniowanie modelu przestrzennej struktury Krakowa (unpublished reaserch project for Office of Spatial Planning of City Council of Cracow) Institute of Urban Design, Faculty of Architecture, Cracow University of Technology, Kraków.

Gyurkovich, M., Sotoca, A. (2019), Quality of Social Space in Selected Contemporary Multifamily Housing Complexes in Poland's Three Biggest Cities, *IOP Conf. Ser.: Mater. Sci. Eng.*, 471, 092009. DOI: https://doi.org/ 10.1088/1757-899X/471/9/092009

Healy, P. (2007) *Urban Complexity and Spatial Strategies. Towards a relational planning of our times*, Oxon - New York, USA: Routledge.

Hofert Feix, K. (2014) Recycling industrial heritage, *Technical Transactions*, *Series A,* 1-A (111) 57-67.

Holl, S., Fenton, J. (1985), *Hybrid buildings.* Pamphlet Architecture no.11.

Koolhaas, R. (1997), *Delirious New York- A Retroactive Manifesto for Manhattan*, New York, USA: The Monacelli Press.

Klanten, R., Ehmann, S., Borges, S. (Eds.). (2012), *The Sky is the Limit. Applying Radical Architecture. New possibilities for seemingly impossible buildings and spaces*, Berlin, Germany: Gestalten.

Kobylarczyk, J., Dobrowolski, J.W. (2019), Sustainable design, modern environmental protection engineering and bioeconomics, *Technical Transactions,* Vol. 12, pp. 45–52.

Kosiński, W. (2016), *Paradigm of the City of the 21st Century. Between the Past of the Polis and the Future of the Metropolis*, Kraków, Poland: Wydawnictwo Politechniki Krakowskiej.

Kriken, J.L., Enquist, P., Rapaport, R. (2010), *City Building. Nine Planning Principles for the Twenty-First Century*, New York, USA: Princeton Architectural Press.

López, A. (2011). *22@ Barcelona. 10 Anys de Renovació Urbana*. Ajuntament de Barcelona. Direcció de Serveis.

Nan, E. (2013), *Good Urbanism. Six Steps to Creating Prosperous Places*, New York, USA: Springer.

Orłowski, W. (2017). *Mixed Use Neighbourhood Singapore-Queenstown-Dover* (master thesis project) Institute of Urban Design Cracow University of Technology, Kraków.

Paciorek, M., Poklewski-Koziełł, D., Racoń-Leja, K., Byrski, A., Gyurkovich, M., Turek, W. (2021), Microscopic simulation of pedestrian traffic in urban environment under epidemic conditions, *Bulletin*

E-ISSN 1886-4805

of the Polish Academy of Sciences. Technical Sciences, 69(4), 1-15. DOI: https://doi.org/10.24425/bpasts.2021.137725

Palej, A. (2019). *Cities of Information Civilization. New Challenges*, Kraków, Poland: Wydawnictwo Politechniki Krakowskiej.

Phaidon. (2008). *The Phaidon atlas of 21st century world architecture*. London, UK: Phaidon.

Plata, A., Płatek, D., Piecuch, P. (2020). Listen to the frozen ones - masterplan for the area of Wybickiego street in Cracow (course project, year 3. Semester 06., bachelor studies) Chair of Urbanism and City Structure Architecture, Cracow University of Technology, Kraków.

Poklewski-Koziełł, D. (2018), Role of waterfront areas and pocket parks in shaping of housing environment on the example of the Nordhavnen Housing Estate in Copenhagen, *Housing Environment*, no.24, pp.74-81

Racoń-Leja, K. (2016). Trzech Wieszczów Avenue in Krakow – spatial reinterpretation in light of predicted transport changes, *Technical Transactions. Architecture*, vol. 113, no.2-A, pp.93-105.

Rejowski, T. & Prost, M. (2016). *Megastructure skybridge in Singapore,* (master thesis project) Institute of Urban Design Cracow University of Technology, Kraków.

Roca Cladera, J., Biere Arenas, R., Gyurkovich, M., (Eds.). (2016). *Back to the Sense of the City: 11th VCT International monograph book, Year 2016, July, Cracow*, Barcelona, Spain: CPSV. Retrieved from www.upcommons.upc.edu/handle/2117/90350

Rose, J.F.P. (2017). *The Well-Tempered City. What Modern Science, Ancient Civilizations and Human Nature Teach Us About the Future of Urban Life,* New York, USA: Harper Collins Publishers.

Rogers, R. (1997). *Cities for a small planet*, London, UK: faber&faber.

Sassen, S. (2001). *The Global City: New York, London, Tokyo,* Princeton & Oxford, USA & UK: Princeton University Press.

Schneider- Skalska, G. (2018). Interdisciplinary education of architects both globally and locally, *World Transactions on Engineering and Technology Education*, vol.16, no.4, 356-361.

Schneider-Skalska, G., Kusińska, E. (Eds.). (2017). *Urban Housing Environment*, Kraków, Poland: Wydawnictwo Politechniki Krakowskiej.

Sennet, R. (2020). How should we live? Density in post-pandemic cities, *Domus* 1046. Retrieved from https://www.domusweb.it/en/architecture/2020/05/09

Seruga, W. (2014). Twenty-first century housing architecture. Development, *Technical Transactions. Architecture*, vol. 115, no.1-A, pp.209-239.

Szczerek, E. (2019). Loss of potential: Large-Panel Housing Estates – Czyżyny Case, *IOP Conf. Ser.: Mater. Sci. Eng.* 471 092034. DOI: https://doi.org/ 10.1088/1757-899X/471/9/092034

Wejchert Architects. (2007). *Wejchert Architects*. Retrieved from http://www.wejchert.ie

Włoch-Szymla, A. (2019). Urban sprawl and smart growth versus quality of life, *Technical Transactions*, Vol. 12, pp. 85–98.

Zellner, P. (2000). *Hybrid Space – New forms in digital architecture*, London, UK: Thames & Hudson.