archi|DOCT

The e-journal for the dissemination of doctoral research in architecture.

February **2021**

16

URBANITIES

www. archidoct.net

ISSN 2309-0103

archi DOCT *The e-journal for the dissemination of doctoral research in architecture.*

Listed in Scopus®

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

Architecture within infrastructure: the habitable bridges as a vector for social urban regeneration

Bianca Andaloro // PhD Candidate, DARCH, Dipartimento di Architettura, Palermo (UniPa), Italy

Abstract
The human desire to connect man and nature, architecture and environment seems to result in the imaginary brought by the concept of the bridge, often conceived as a new space of the city, a different soil and a public space. Considering the actual environmental situation that our contemporary cities are nowadays facing, it is possible to recognise in the architectural model of the living bridge a valid approach to confront the needs of the city and of its inhabitants. Despite its old origins, this type of architecture shows a strong flexibility, adding to the infrastructural features also new characters. Starting from the Thames Water Habitable Bridge Competition, this article aims to underline how architectural features such as multi-scalarity, multi-temporality and multi-functionality are needed to design new urbanities and which type of re-generation recent projects can produce.

Keywords
Urban infrastructures; Inhabited bridges; urban regeneration; adaptivity; multifunctionality.

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

1. Introduction

Most of the cities in the contemporary age are fragile, weakened by a perpetration of urban practices that for a long time have ignored external phenomena. Among the major causes of the actual climate change, natural catastrophes, and the resulting urban disasters, it is possible to recognise land consumption, chaotic urbanization, unauthorized construction and obsolescence of infrastructures. The city of the Modern Age, in fact, guided by a positivist spirit and a constant trust in knowledge and technology, gave rise to a physical re-proposition of the mechanistic vision of reality: therefore, the city, conceived as a determinable element, has inevitably led to the absolute domination of man over nature (Mandoul, T. et al., 2012).
This clear separation between man, city and nature, unquestionably a reflection of a society projected towards the future with an industrial-chain approach, has put in place a mono-functional and highly hierarchical paradigm that underlines an anti-ecological approach. Moreover, dividing the urban fabric into mono-functional areas, although it certainly brought great advantages to the issue of the un-healthiness of the suburbs, determined that phenomenon of zoning as a formal revival of the production cycle linked to growing industrial development. The perpetuation of this approach towards the city explains the contemporary urban difficulties in facing climate changing and environmental disasters.

The urban environment, in its moment of trend reversal with respect to the homeostatic[1] characteristics of the last century, appears today as the most suitable environment for experimenting and welcoming this transition, through the definition of new paradigms and design approaches.
Therefore, it is a belief of the author that the most appropriate response to the sudden changes (not only in climatic but also in territorial conditions), refers to an 'adaptive'[2] conception of the design of the city and of its buildings. It is therefore possible to consider adaptivity as an approach capable of defining different characters and tools for an integrated and systemic design, in order to create new relationships between buildings, man and the environment.
Although adaptivity has evolved from the responsive approach underlining the importance and the role of time (Elmokadem et al., 2016) and leading to a design that is often data driven, it is possible to consider as adaptive and adaptable a specific type of architecture that has been perpetuated in time for centuries and that in the early Nineties emerged again in the architectural scenario: the (in)habitable bridge. It is, in fact, at the same time, a vector that physically joins man, the city and the environment and an element of a bigger informational infrastructure. Its adaptiveness is related especially to the multi-functionality that has always characterized it and that has consecrated the social role of this urban device.

1. Homeostasis is the natural tendency to achieve relative stability of all living organisms for which this regime dynamic must be maintained over time, even when external conditions vary, through self-regulating mechanisms. It is interesting to notice that such definitions that we derive from biology, could be easily applied to loads of Modern cities because of their behaviour over time. Architecture, indeed, has always tried to maintain the same characters despite the changements around, differently from what it is proven to be necessary: the evidence of adaptation to external factors.

2. In an active sense, the term indicates the ability of a system to change its structure as external parameters change, while in the passive meaning it indicates the inherent ability of the system to trigger mutation processes for the environment.

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

2. City and Infrastructure

Starting from the definition of a city as a complex system and meaning by it a combination of elements that are individually autonomous but capable to collaborate in unison, it is believed that this system will be more complex the more it is able to incorporate the necessary skills to activate processes of regeneration and adaptation in respect of external phenomena (Manigrasso, 2012). With this aim, architecture needs to modify its characters and invariant aspects, defining new matters and paradigms. The already mentioned complexity that we recognise nowadays in the architectural field, we derive it from a turning point in the architecture design process: it is the passage first from the Industrial to the informational era and then to the digital Age (Picon, 2010).

The characters of multi-scalarity, multi-temporality and multi-functionality can be considered as a consequence of the complexity that the informational network needs in order to work properly. And for the same reason, an architecture that must face continuous changes and new social needs, has to augment its features in order to better respond to new social, political and human values. Despite the continuous evolution of the Smart paradigm, broadly declined into different facets that try to merge HCI with human condition, behaviour and also with the environment[3], it is needed to understand what constitutes the smartness of this approach, that does not often show a clear purpose for human beings (Halpern, 2017).
The introduction of informational systems into architecture, especially through cybernetic processes, has consecrated buildings (and the city in general) as performance places and big data visualisation interfaces whilst instead it would be better to interrogate about the spatial impact of this digital and physical transformation.

As said, conceiving architecture as part of a broader system that collects many external facts (or data) from different fields is the result of a way of thinking that belongs to the information technology and that supports a strong bond between man, architecture and the (social, cultural and physical) environment. It is therefore not necessary to individuate a high-tech architecture to read this complexity: instead, it is possible to consider some processes of regeneration that involve re-building and re-thinking the existent as valid responses to a claim for adaptivity.

3. The paradigm of the Smart cities has been exploited a few decades ago but recently has unveiled its fragility in the lack of consideration of human features, needs and interests. For this reason, which also implies the neglection of the social and the democratic dimension, leading from an utopian to a dystopian idea, it seems necessary to focus on variation of this smartness. It seems in fact fundamental to reintroduce the human figure into the relations between men, architecture, environment and technologies: this brought to the idea of the Senseable city, as well of the Sentient city or Cognitive city, meaning systems able to sense, perceive and respond to changes in their environment. (Psaltoglou, 2018)

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

What is evident from a historical point of view is that urban transformation and infrastructural evolution moved during the Twentieth century on parallel lines and at similar speeds. The infrastructure highly modified the space and the environment affecting urban activities in a concrete way and defining different new clusters of mobility figures, which are fundamental for a social process of regeneration. The definition, during the Twentieth century, of a vast imaginary in which architecture and infrastructure merged, has welcomed the definition of new spatial suggestion: many architects, have in fact tried to combine the two figures, aiming to transpose the elements of the infrastructure into the architectural project[4].
The results of these first years of experiments, however, did not yet reflect the combination between the two disciplinary areas, but were limited to create relations (as for example juxtaposition and overcoming) between the architectural and infrastructural elements. In this way, infrastructure, with characteristics and needs proper of a technical element, became in years the matrix of architectural projects thus transforming elements of the road into architectural components and giving them the character of public and liveable spaces. Therefore, the attractiveness of this new type of public space is the variety of scale, the possibility of hosting transit and destination at the same time and the hybrid programmatic potential it offers. Designing the mixed uses of a single urban artefact, together carriage-able and pedestrian, private and public, no longer means to design on the edge of the infrastructure, but instead to define an extensible and open approach for the city.

Among the old and new infrastructure that seek a relation with architecture, it is possible to individuate one figure which has always found a way to evolve over time, re-thinking and adapting itself to the contemporary needs: the (in)habitable bridge. Thanks to the flexibility that it gained in centuries and that allows it to merge with the city, the environment and the buildings, this figure shows an interesting way to approach the contemporary design requirement by embodying the architectural complexity at different scales. This dual character then absorbs also the connection that infrastructure typically incorporates between both the geographical and urban element in the territory: in fact, the separation produced by the bed of a river that flows into a city, has the same impact as a large urban artery imposed on the urban fabric and requires the same connection between the two sides. Although the characters of this particular type of bridge have varied over time, two components can always be recognised: the infrastructural element, which allows the overcoming of the obstacle (the river, the road) and the architectural device capable of giving the bridge a cultural, economic, functional and social advantage[5].
Thanks to the presence of these two elements, the (in)habitable bridge is configured as an element of strong urban coherence, capable of establishing a linear continuity where there is a separation in the urban fabric. It becomes a generator of urbanity thanks to that prerogative that has

4. A relevant result of the intersection of infrastructure and architecture is the Solomon R. Guggenheim Museum in New York, designed by the American architect Frank Lloyd Wright and built in 1943: it is a building that clearly expresses the will to transpose into architecture the element of infrastructure through the figures of the parking ramp, here merged to the concept of a walkable space for exhibition. Later on, moreover, the Dutch studio OMA recalled in the project for the Utrecht University, the Educatorium (1992-1995), the idea of designing an infrastructural element of mobility into a building, fading the difference between public and private, indoor and outdoor spaces.

5. This leads to the expressions used in the world to describe a habitable bridge. Whereas Italian, French and English haven't a proper expression with this specific meaning, but instead several which suggest the compresence of the two facets, German is the only language that has it. The word *Überbautenbrücke*, in fact, means exactly "bridge which is built upon, defining a clear category of this building type.

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

always assured its unique character: the functional *mixitè*. Thinking of a project that holds together the architectural and the infrastructural figure allows in fact a new reflection on the new forms of regeneration of the city of the contemporary age.

3. Habitable bridges

Starting from the Middle Age, the figure of the habitable bridge has been spread all over Europe[6], especially in the United Kingdom, France and Italy: Florence and Venice as well as London and Paris explored the infrastructural element of a bridge that hosted small commerce and habitations, often defining in this way a landscape project. The bridge defined a hybrid between a functional element and public urban spaces, which allowed to solve the lack of living space (Pizzetti, 1981) and at the same time to host an unthinkable presence of people and commerce that wouldn't find space anywhere else in the city (Cassani, 2014). As explained by Jean Dethier, "people crossing the Seine would not have been able to see the river, so tall and tightly packed were the buildings on its bridges" (Murray, 1996, 25): the bridge brought to the cities a new soil and a new identity with squares and public facilities. In fact, differently from a pure vehicular bridge, a habitable bridge provides on a hand a continuity with the urban tissue, and on the other, an economic, cultural and symbolic value. Later, during the Machine Era and the Industrial revolution it lost its crucial and urban meaning. It was only in the Nineteenth century, during the Romantic Era that habitable bridges' imaginary rose again, especially because of their influence on the definition of the landscape. During the prolific period of the Modern Movement, the living or habitable bridge benefitted from a modest interest among many architects, probably due to its natural attitude to flexibility in use and space. It is possible to remember, in the latter part of the century, several projects in Europe, referred to figures such as Yona Friedman (Munich, 1959; Paris, 1960) (Fig. 1), Cedric Price (London, 1988), Richard Rogers (London, 1986) and many others. A different condition can be recognised in the US where the new form of the skyscrapers was defined, new cities were founded and innovative infrastructure designed. Here the idea of an infrastructural building was at the core of architects' interest and it is perfectly shown in the projects of L.C.Mullgardt for San Francisco (Fig.2) and Hood for New York. They merged the new type building of the skyscraper with, on a hand, elements of commerce and living and on the other, the infrastructure of air and soil. These new continent-bridges, that faced the economic crises and were never built, were illustrated as a symbol of social, economic and technological progress, the same progress that the US had tried to realise in response to the utopian cities from the '10s and '20s. In more recent times then, the idea of a living or habitable bridge has become more common among contemporary architects which inherited the feature of multi-functional spaces as a way to re-generate the economy of the city by creating a new sense of urbanity.

6. It is quite rare to individuate examples of Habitable Bridges in the Middle East, but it is possible to find some isolated ones as the Isfahan Bridge in Iran. However, in most of these projects it is not recognisable the residential function that is typical of the European ones: instead, they were mostly used as technical objects implemented for social leisure activities.

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

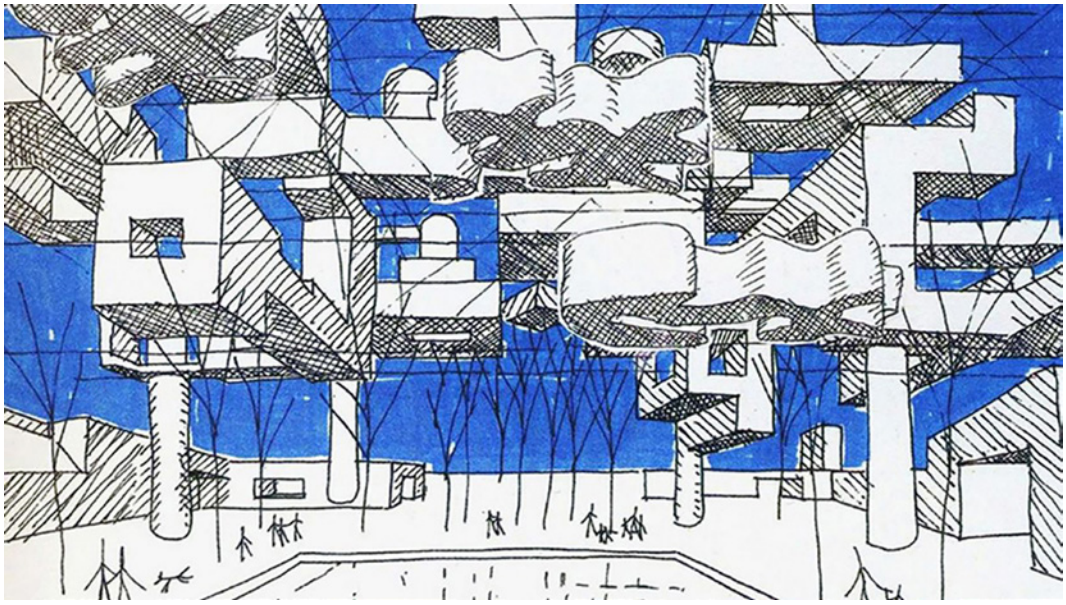

Figure 1
Munich Spatial, Y. Friedman, 1959 ©Yona Friedman

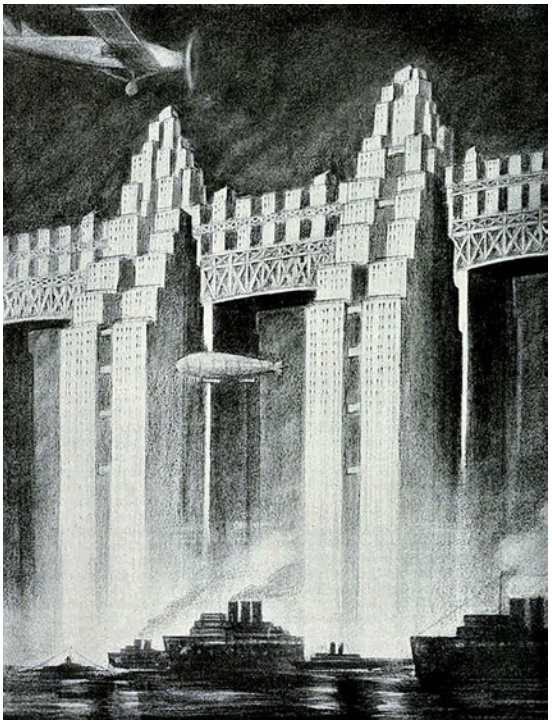

Figure 2
Skyscraper bridge, L.C.Mullgardt, 1924

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

4. Thames Water Habitable Bridge Competition

> *Le temps est désormais venu de les exhumer de notre oubli, d'en comprendre la logique, d'en apprécier les qualités ou les potentialités, et finalement d'en imaginer de nouvelles applications susceptibles de remédier aux déficiences et aux dysfonctionnements de la ville contemporaine*. (Dethier, 1997, p. 34)

Within the context of the exhibition "Living Bridges: the inhabited bridge, past, present, future" curated by Jean Dethier, the Royal Academy of Arts of London organised in 1996, in collaboration with the Centre Georges Pompidou an international competition about the regeneration of a portion of the river Thames, in London. Seven international firms were invited to participate in the "Thames Water Habitable Bridge Competition", with the precise scope of submitting realistic projects that merged commercial, recreational, residential and cultural use, on an only-pedestrian platform. The competition resulted in two ex aequo projects: the deconstructivist inhabited bridge of Zaha Hadid (Fig.3) and 'The Garden Bridge' of Antoine Grumbach (Fig.4).

The interest of Z.Hadid for the imaginary of the bridges goes back to her MArch thesis project, designed under the mentoring guide of Rem Koolhaas in 1976-1977 at the Architectural Association of London, where she conceived a fourteen-levels hotel at the Hungerford bridge on the river Thames. The project submitted for the international competition then presented a series of cantilevered volumes linked in the centre by pedestrian walkways. All public activities found place on the (new) ground floor whilst five different buildings host the residences, the commercial activities and the offices. The iconicity of the project is strictly linked to the structural element of the trusses that form each a different building. They are, in fact, lifted high on the water defining in this way suspended public pathways.

On the other hand, 'The Garden Bridge' of A.Grumbach has been defined by Murray as "the more traditional urban approach" (Murray, 1996, p.135). The bridge consists in fact of three main elements: first, on the south side, a covered public space with tropical plants, restaurant and shops as well as concert and leisure activities called the "world's culture greenhouse"; then, the "Hanging Towers" to support the cables and hosted a hotel and a restaurant; finally, the "Garden Arcade" which links the latter elements and allows pedestrian access through boardwalks at the water level. What this competition brought into the architecture scenario is a strong interest in finding a connection between landscape, environment and built architecture by adding the new features of multi-functionality, multi-temporality and multi-scalarity. Due to the need of regeneration and aiming to define an efficient economic and social network, in the last decades it became necessary the process of re-thinking and re-building separated, marginal and almost forgotten areas of cities. (Metaphorically) Bridging them to the existing allows thus to create new connections via physical and virtual means.

In the following paragraphs two declinations of the habitable bridge in the contemporary city are presented, both regarding water or highway infrastructure, in order to understand how the architecture process found a path to re-generate the urban tissue by creating new different forms of connections. The first attitude identified intervenes where it is possible to visually separate the architectural and the infrastructural elements; the second one instead, shows projects that merge the building and the bridge, often intervening on the element of the soil, modifying the infrastructure.

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

Figure 3
Proposal for "Thames water habitable bridge competition", Z.Hadid, London, 1996

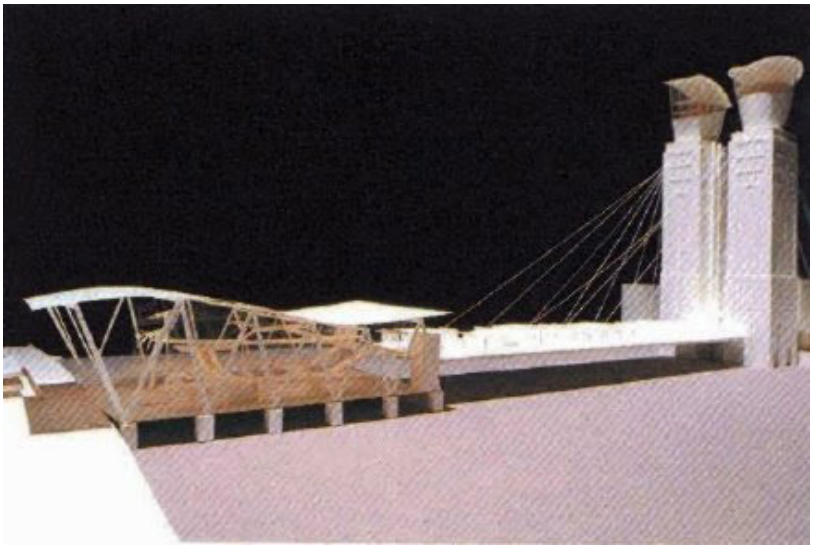

Figure 4
Proposal for "Thames water habitable bridge competition", A.Grumbach, London, 1996

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

4. Bridges + buildings

The first category includes projects where characters and morphology of the two elements are noticeably distinct so that it is easy to identify the infrastructural part that hosts the mobility and the architectural one, concerning the social, cultural, private and public activities.
Despite this, it is in their intersection that the 'habitability' of the bridge is shown, where architecture and infrastructure merge and define an interface that allows different flows. We reckon in this group two contribution for the competition of "Réinventer Paris" (organized in 2016 in the site of Pershing): one is the project Mille Arbres (Fig. 5) by Sou Fujimoto Architects + OXO Architects and the other is the project named PXP (Fig. 6) by OMA + DATA Architects + Arup. "Mille Arbres" shows a bridge that frames the underpass of the highway with a layer of commerce, public spaces that allows different fluxes, function and mobility, and above which a high rise complex building takes place.
The OMA proposal instead is defined by a composition of four buildings that host several functions. Here, the different rotation of the buildings creates private and public courtyards that allow various fluxes and mobility.

Similarly, the Pont Jean Jacques Bosc (Fig. 7), conceived by OMA with Clément Blanchet for a competition in Bordeaux (2013), declines this approach on a bridge above the Garonne river. They design a new soil as a tray and place on it several artifacts, temporalities, functions and mobility. The bridge is a means to cross a natural limit and at the same time it deconstructs and fragments its habitability into pieces adapting to different circumstances and needs. Although the projects here briefly introduced have all been designed for competitions, it is possible to reckon the implementation of new forms of mobility and of new mixité as a way to reinforce social and economic regeneration. These projects aim to create a fracture in the ordinary city by joining neighbourhoods or territories separated by an artificial boundary. The habitable bridge here creates the link and the means for connecting diversities and defining new forms of sociality even maintaining separate the morphology of its elements.

Figure 5
"Mille Arbres", Sou Fujimoto Architects + OXO Architects, Paris, 2016 © Sou Fujimoto Architects + Manal Rachdi OXO Architects + OGIC MORPH

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

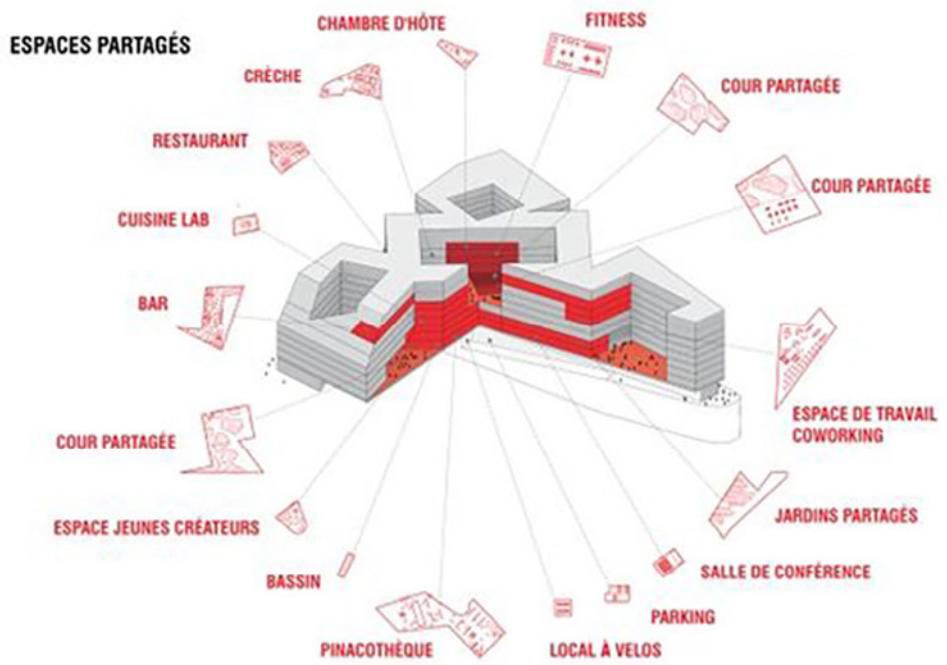

Figure 6
"PXP", OMA + DATA Architects + Arup, Paris, 2016 ©OMA

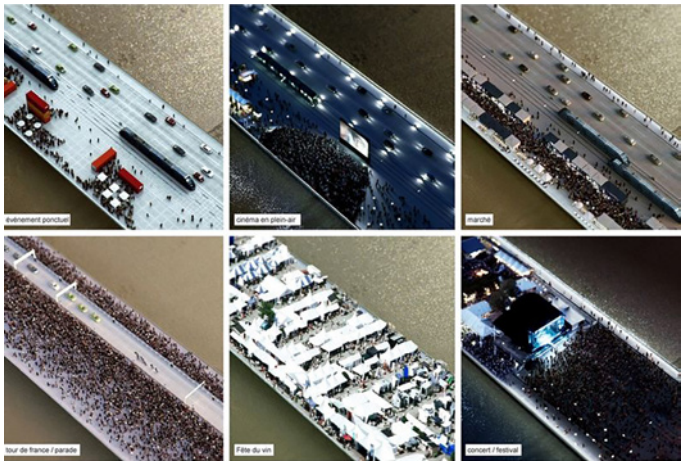

Figure 7
"Pont Jean Jacques Bosc", OMA + Clément Blanchet, Bordeaux, 2013 ©OMA

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

5. Bridge ≡ Building

The second category includes projects where the infrastructure is entirely merged into the architectonic composition, designing spaces that allow different activities in different moments of the day, and guaranteeing the multi-temporality and the multi-functionality feature. Taking as an example the Halle Commune - Pont Pleyel by OMA, designed for Saint-Denis in 2006 (Fig. 8), a new soil bypasses the railway trench, weaving continuity with the existing tissue. The declared intention of this project, that did not result as a lauréat of this competition, is to provide the city a homogenous volume, here represented by the continuous façade that resembles a greenhouse. At the same time, it gives the bridge its character of habitability and contains all the different functions within it. Similarly, the 11th Street bridge park, designed by OMA and Jason Long for Washington DC in 2014 (Fig. 9) doubles the close highway overpasses by defining two new intertwined soils where only public activities take place. Therefore it will use the infrastructural value of the bridge to define a landscape horizon able to relate several functions at different scales: from the pedestrian path to the public amphitheatre, the two platforms define outdoors covered places and allow the coexistence of fluxes and activities diverse in time.

In the manner of the 11th Street bridge park, it is possible to recognise as part of this group the intervention attributed to Diller & Scofidio + Renfro on the existing elevated railway of New York, the High Line (Fig. 10) and the similar intervenes that derived from it. Built in 1929 in a contest in which architecture and infrastructure were trying to merge their characters, based on the utopian cities of 1910-20, the High Line was a first step to seek new relations between architecture and the city. Its superimposition about the urban tissue, often regardless of the existing, and the bond of interrelationship with the close buildings, defines a peculiarity for the time that allowed years later to avoid its demolition. The action of regeneration designed first by the Field Operation group and then improved in collaboration with the association Friends of the High Line, consisted in the reconversion of the infrastructural viaduct into a public space, allowing the economic regeneration of the West Chelsea and the Meatpacking District.

Figure 8
"Pont Pleyel, Halle commune", OMA, Saint-Denis, 2016 ©OMA, OLIN

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

Figure 9
"11th Street bridge park", OMA + Jason Long, Washington DC, 2014 ©OMA

Figure 10
"High Line", Diller Scofidio + Renfro, Manhattan, 2006 ©Iwan Baan

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

Although the High Line may no longer be considered a proper bridge[7], it is still possible to consider it as part of the (in)habitable bridge type due to the complex network of services it supports and by which it is supported. In fact, the viaduct hosts a slow mobility in a separated lane that does not entirely follow the underlying roads layout, allowing the link between distant areas of the cities through dedicated, healthy and public paths, thanks to the support of the associations that occupy it. To complete the process of economic regeneration developed by this project, it could be interesting to involve new private actors, as the owners of the buildings that the High Line crosses, in order to transform these intersections, which at the moment are the least successful part of the entire operation (Tesoriere, 2010). The impact of this project on the physical location of the city, as well as on its identity, has led over time to the design and implementation of autonomous systems, on existing or new infrastructures, such as Skygarden by MVRDV, realised in Seoul in 2015-2017 (Fig. 11), which allows the pedestrian connection between parts of the city and that tried to solve the lack of intersection with surrounding buildings. Therefore, this type of operation reveals the potential of this urban device (the bridge) and at the same time the importance of the cohesion between the public and private operators, as they help to redevelop, albeit for parts and according to different times, urban portions with great potential. Furthermore, the characters of multi-temporality and multi-functionality are fundamental in order to guarantee an inclusive process or regeneration that links architecture, infrastructure, and users in a systemic and complex way.

7. After the abandon, some portions of the viaduct have been demolished in the years: the southern part in the Seventies, the northern part in the Eighties (in order to build the Javits Center9 and lately a small section in the West Village in 1991.

Figure 11
"Seoullo 7017 Skygarden", MVRDV, Makkink & Ben Kuipers, Seoul, 2015-2017

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

6. Conclusion

In conclusion, the concept of habitable bridges can be considered as a valid design figure to re-think and thus regenerate the contemporary city. Its peculiarity to adapt is in fact an essential condition to intervene on the urban tissue with the intention of including different flows (in terms of people and resources),functions and temporality. This approach would then promote the continuity of the city, erasing the inequalities and the distances by creating an unicuum with the environment. It is also a constant element of the desire to exploit all the spaces that can implement the potential of the new architectural element, thus ensuring a dual combination with the infrastructure. As the study cases mentioned show, the collaboration between public and private actors, together with the design of an infrastructure-architecture, has a relevant role in obtaining a result that is both economically and culturally regenerative. Furthermore, it allows to implement architecture with those features derived from the IT conception, such as the multi-scalarity, multi-temporality and multi-functionality in order to design for the re-generation of our urbanities.

ISSN 2309-0103
www.archidoct.net
Vol. 8 (2) / February 2021

References

Cassani, A.G. (2014) Figure del ponte. Simbolo e architettura, Bologna: Edizioni Pendragon.

Dethier, J. (1997) Les Ponts habités. *Urbanisme*, n. 292, p.34.

Elmokadem, D.A., Ekram, D.M., Waseef, D.A., Nashaat, B. (2016) Kinetic Architecture: Concepts, History and Applications. *International Journal of Science and Research* (IJSR), Vol. 7 No. 4, pp. 750-758.

Halpern, O. (2017) Architecture as machine: the smart city deconstructed', in Goodhouse A., *When Is the Digital in Architecture?*, Canadian Centre for Architecture: Sternberg Press.

Mandoul, T., Fol, J., Hertweck, F., Lefebvre, V. (eds.) (2012) Climats, Paris/Gollion: inFolio.

Manigrasso, M. (2012) Verso la Città ad_Attiva Rispondere ai cambiamenti climatici attraverso una nuova concezione del tempo nei processi e negli esiti progettuali. *Proceedings of XV Conferenza Nazionale SIU*, 6.

Murray, P. (1996) Living Bridges. The inhabited bridge, past, present and future, Munich: Prestel Verlag.

Picon, A. (2010) Digital Culture in Architecture: An Introduction for the Design Professions. Basel: Birkhäuser.

Pizzetti, G. (1981) Alcune considerazioni sulla evoluzione del ponte. *Casabella*, XLV, n. 469, p.27.

Psaltoglou, A. (2018) From smart to cognitive cities: intelligence and urban utopias. *Archi-DOCT*, vol. 6 (1), pp. 95-106 [Online] Available at: http://archi-doct.net/Issues/vol6_iss1/ArchiDoct_vol6_iss1%2006%20From%20Smart%20to%20Cognitive%20Cities%20Psaltoglou.pdf.

Tesoriere, Z. (2010) Recuperare l'infrastruttura, L'High Line di New York, 1929-2009. *Agathon*, Vol. 2, pp. 17-22, Barcelona: offset studio.