BENDING THE URBAN FRAME

by José Luis de Vicente and Fabien Girardin

Extreme Urbanisation

——————— At the dawn of the second decade of the 21st century, the city –the quintessential model of community organisation– has come to a curious crossroads. Having put behind us the early digital prophecies predicting that the rise of the virtual would make cities expendable, the continuing relevance of cities is now beyond all doubt. Every day, thousands of people abandon rural life and become urban dwellers, feeding the huge megalopolises that match the populations levels of entire countries in previous centuries. Almost 20 cities, most of them scattered throughout the Global South, will reach populations of 20 million in the 21st century.

——————— For the first time in history, more people on the planet live in cities than outside of them; humanity is nearing its full transformation into an eminently urban species. However, contemporary cities are far from being idyllic spaces.

——————— City infrastructures only barely manage to withstand the burden of a highly mobile population with an insatiable appetite for consumption. The well-being of cities is dependent on the smooth functioning of transport and supply networks that have become increasingly unstable; and their growing cultural diversity has gone hand in hand with social tensions and increasing economic inequalities. In the huge new metropolises, stunning architectural icons cast their shadows onto vast expanses of shantytowns.

——————— In an age marked by systemic crises like global warming and the end of fossil fuels, these new mega-cities are facing necessary and unavoidable transformations. But most of the resources that a city can use in striving to overcome these challenges date back to the 20th century. However, over the last three decades, something has been changing in the city's nervous and circulatory system: its physical infrastructures are starting to be complemented, governed and even replaced by information systems.

——————— At the same time, "computers" have started to blend into the fabric of urban life, altering people's experience of the city and, in particular, influencing the organisation of everyday life and social interactions.

From Nomadic Architecture to Networked Urbanism

——————— One of the possible narratives that can account for the evolution of architectural and urbanistic thought from the 1950s to the present is that of its gradual dematerialisation. The vision of the city as a built space is increasingly being replaced by that of a set of dynamic processes and human flows superimposed onto its physical infrastructure. As architects move away from working with plans and towards working increasingly with

words and narrative, their output is measured in terms of ideas more than structures. After Situationism and the *dérive*, urbanism no longer limits itself to planning physical space, and increasingly concerns itself with capturing the more invisible and intangible qualities of the urban condition.

———— As early as the 1960s, utopian and radical architects envisioned that the cities of the future would not only be made of brick and mortar, but also shaped by bits and flows of information. The urban dweller would become a nomad inhabiting a space in constant flux that mutates in real time. *New Babylon*, a veritable city plan for the future by the Situationist architect Constant Nieuwenhuys, presents a space that is modular, endlessly expanding and not organised along a radial axis, and therefore without a centre. Almost at the same time, French-Israeli architect Yona Friedman proposed another liberating utopia in his *Mobile Architecture Manifesto*, which imagined a city that was not organized by narrowly delimited uses of space. His *Spatial City* is an urban operating system, in which citizens themselves design, build and modify temporary configurations that only exist for as long as they adapt to their needs. *Spatial City* was an experiment in "mobile architecture", but Friedman was not suggesting that the city be mobile, he was recognizing that citizens are –and his city was– a set of infrastructures that "are neither determined nor determining". But perhaps the names most frequently mentioned today to explain the link between utopian architecture and new digital urbanism are the British collective Archigram and its mentor, Cedric Price.

———— In its projects, Archigram seeks to develop an architecture of gesture, of behaviour. Gesture operates as an activator of functions in a space, just as we activate commands when we select an icon in a digital graphic user interface. In order to provide life support for its ephemeral, regeneratable cities, Archigram began to consider the importance of information infrastructures. *Plug-in City*, one of its first projects, is a city that can be assembled and rebuilt, in which support structures like scaffolds and cranes are always visible because they are the operating infrastructure of the city. The *Plug-in City* is clearly related to one of the most influential unbuilt projects of the second half of the 20th century: Cedric Price's *Fun Palace*, a mutable building without a single predetermined function, that was intended to allow users to shape and design its form as well as the activities that take place in it. Price borrowed from systems theory and cybernetics to come up with the idea that the input of user behaviour should determine the building, introducing the possibility of a totally different relationship between space and those who dwell in it.

———— Their visions have taken on new meaning in an age in which information networks govern many of the city's functions. The power to measure, analyse and represent information is blending into the objects and surface around us, transforming our sense of space and relations. Consequently, cities can no longer be understood and designed as mere physical spaces.

From Technologies of Shelter to Spatial Intelligence

———— The digitalisation of the city is becoming part of a creative decision-making process that is then translated into built form. For instance, *Building Information Modeling (BIM)* is used to integrate complex design processes that involve multiple parties, and deprive architects and urban planners of their roles as sole "master builders" predicating the urban landscape. Indeed, new practices are beginning to embrace emerging methodologies based on spatial intelligence, which bend the physical world through new measures, representations and maps of urban dynamics, requiring technical and conceptual knowledge that the traditional disciplines lack. The resulting gap is being filled by new actors who play a role in shaping the city: telecom operators and hardware and software companies, but also designers and artists.

———— MIT SENSEable City Lab researchers have developed representations that map the life of the city and boost our collective awareness of the urban environment as a living organism. Their *Real-Time Rome* project maps aggregated data from cell phone

network activity, buses and taxis in Rome to come up with a deeper understanding of urban dynamics in real time. By revealing the pulse of the city, the project aims to show that the acquisition and dispersal of urban information can be a source of novel information about a city. In the process, it opens up possibilities of reducing the inefficiencies of current urban systems and provides tools for a more sustainable urban future. By overlaying mobility information onto geographic and socio-economic references, the relationships between fixed and fluid urban elements are revealed. These real-time maps help us understand how neighbourhoods are used throughout the course of a day, how the distribution of buses and taxis correlates with fluctuating human densities, how goods and services are distributed in the city.

————— The vision of the city as a historical conglomerate of buildings and infrastructure is augmented with dynamic visions of the city that include its information networks, mobile technologies, the increasing mobility of citizens, and the presence of environmental parameters such as air quality, noise levels and stress factors. As this urban data becomes accessible, the power to inform is shifting into the hands of individuals. *In the Air*, a project by Nerea Calvillo and a team of collaborators, is an example of the emergence of a bottom-up open process. It brings together young architects, designers and software developers in a joint collaboration that takes the form of a platform working to make the microscopic and invisible agents in Madrid's air (gases, particles, pollen, diseases, etc) visible, and to see how they perform, react and interact with the rest of the city. These data are communicated in a digital and a physical form by a "diffuse façade", a massive indicator of the components present in the air, in the form of a changing cloud that blurs the boundaries between the architecture and the atmosphere it has invaded, and mediates the activity of the participants it envelops.

————— These soft, invisible architectures fashion sentient and reactive environments through information layers that are integrated into the actual design of physical space. For instance, in his work *Wi-Fi Structures and People Shapes*, Dan Hill analyses how the fluctuations of wireless signals can be mapped onto the informal use of space. His sketches reveal how users interact with the wireless space and elements like furniture that were provided for them as part of the investigation.

A Catalogue of Design Scenarios

————— The *Habitar* project offers a journey through these emerging urban scenarios. It is a three-dimensional catalogue of projects and images by artists and design and architecture studios, as well as hybrid research centres and media labs. It is an overview of the practices, tools, solutions and languages that are being developed to negotiate every day life in this new urban predicament.
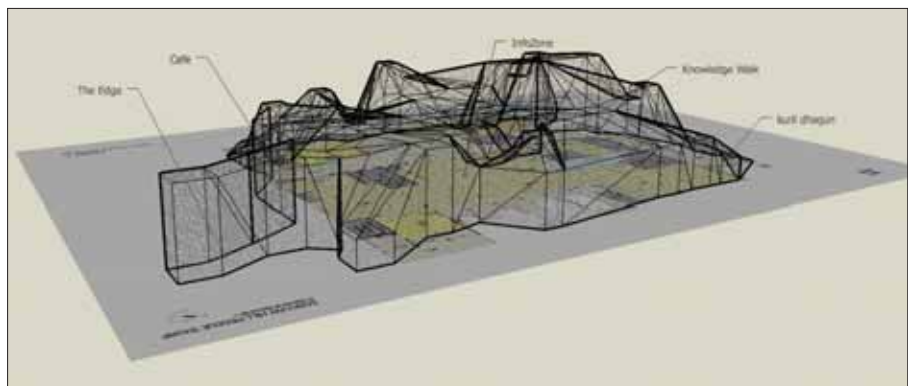
Dan Hill. *Wi-Fi Structures and People Shapes*, p. 98.