Dario Costi
Giovanni Leoni *Editors*

Smart City: A Critical Assessment

Springer

The City Project

Strategies for Smart and Wise Sustainable Urban Design

Volume 6

The book series The City Project reports on applied research and operational developments that promote urban renewal and the sustainable transformation of contemporary cities. Inspired by the "City of Man" as imagined by Adriano Olivetti and Ernesto Nathan Rogers, and going beyond the concept of the smart city and related technological advances, the series' goal is to present holistic, practice-oriented and multidisciplinary strategies for realizing the City 4.0, i.e., the city of the fourth industrial revolution, in keeping with the objectives of the UN's 2030 Agenda for Sustainable Development.

In particular, the series reports on effective design, planning and management approaches that leverage urban and architectural design skills, engineering, environmental and social expertise, and administrative abilities alike. It welcomes books on each of the aspects mentioned above, as well as studies analyzing multiple aspects, their interactions and/or holistic solutions. The City Project addresses a very broad readership, including designers, engineers, architects, social scientists, stakeholders and public administrators, who deal with various aspects of the realization of the City 4.0. It publishes theoretical investigations into the contemporary built environment, international case studies, and pilot projects concerning urban renewal and the regeneration of urban areas, as well as the proceedings of key international conferences.

Books published in this series are devoted to supporting education, professional training and public administration. Outstanding PhD theses on emerging topics, if properly reworked, may also be considered for publication. The series is published with the support of the Smart City 4.0 Sustainable LAB, an interdisciplinary teaching and research project on future cities initiated by the University of Parma, and jointly implemented with other regional universities (the University of Bologna, University of Ferrara, and University of Modena and Reggio Emilia).

About the Cover

The cover of the book series The City Project features a painting by Carlo Mattioli (C. Mattioli, *Estate in Versilia*, 1974, oil on canvas cm. 118 × 70, Catalog n. 1974D0029, Courtesy of Fondazione Carlo Mattioli, thanks to Anna Zaniboni Mattioli)

The horizon of poppies painted by Carlo Mattioli between the dark background of the forest and the white plane of the wheat, becomes for us, thanks to a transfiguration of meaning that aligns with the attitude towards abstraction rooted in the figure of the painter, a city which is intertwined with its landscape, evoking the idea and the possibility of recomposing a balance and seeking an integration between settlement and environment, between human space and natural element.

Dario Costi · Giovanni Leoni
Editors

Smart City: A Critical Assessment

Springer

Editors
Dario Costi 🆔
Department of Engineering
and Architecture
University of Parma
Parma, Italy

Giovanni Leoni 🆔
Department of Architecture
University of Bologna
Bologna, Italy

Cover illustration: C. MATTIOLI, Estate in Versilia, 1974, oil on canvas cm. 118 × 70, Catalog
n. 1974D0029, Courtesy of Fondazione Carlo Mattioli, thanks to Anna Zaniboni Mattioli.

About the Laboratory Research Team

Smart City 4.0 Sustainable LAB is a laboratory carrying out research on the contemporary city at the University of Parma. It has been supporting public bodies, institutions and stakeholders in the territory since 26 March 2018. In 2019, on the strength of a memorandum of understanding signed between the University of Parma, the Emilia-Romagna Region and Lepida ScpA, the laboratory formed an interdisciplinary and inter-university network composed of professors from the Universities of Parma, Modena and Reggio Emilia, Bologna, Ferrara, and the Milan Catholic and Polytechnic Universities, Piacenza campus. Since then, the research groups of the universities involved have initiated integrated research activity with the perspective of sharing an overall, organic and heterogeneous response that provides solutions for the implementation of intelligent and sustainable cities by collaborating with the regional Federations of Professional Orders of Engineers, Architects, Surveyors and Experts, ANCE (National Association of Building Constructors), ANCI (National Association of Italian Municipalities), CNA Emilia-Romagna (National Confederation of Craftsmen and Small and Medium Enterprises), Legacoop Emilia-Romagna, Arpae (Regional Agency for Prevention, Environment and Energy of Emilia-Romagna), ADBPO (Po River District Basin Authority), Regional Agency for Territorial Safety, Civil Protection and AIPo (Interregional Agency for the Po River).

Laboratorio di Ricerca
SMART CITY 4.0
sustainable LAB

About the Publication

The following publication is the outcome of an invitation-based international conference organised by *Smart City 4.0 Sustainable LAB* on 25 June 2021 entitled *Smart City? A critical position. Glossary and interdisciplinary views. A cultural exchange after a year's work* which had the following structure:

- Presentation and discussion of the research *Glossary of contemporary city terms*, which involved the collection and critical analysis of a series of definitions and neologisms related to some models of organisation and development of the city today.
- Presentation of *Video interviews on the city of the Fourth Industrial Revolution* to Stefano Zamagni, Derrick De Kerckhove, Alberto Broggi, Giovanni Maria Flick, Sébastien Marot edited by the members of the Scientific Committee of the *Smart City 4.0 Sustainable LAB*.
- The critical positioning towards the Smart City topic of the members of the Scientific Committee of the *Smart City 4.0 Sustainable LAB*.

All listed interventions, following the discussion at the conference, were later transformed into research papers and were finally published after positive evaluation by the Editorial Board of *The City Project* Series.

Contents

Editors and Contributors

About the Editors

Dario Costi, Arch. Ph.D. is Full Professor in Architectural and Urban Design in the Department of Engineering and Architecture at the University of Parma. He is Director of the interdisciplinary teaching and research project "Smart City 4.0 Sustainable LAB", which is promoted by the University of Parma in cooperation with the Emilia-Romagna regional government and the public digital infrastructure Lepida and involves the Universities of Ferrara, Bologna, Modena and Reggio-Emila, Piacenza as well as local Authorities and stakeholders. He is a member of the Ph.D. Program in Civil Engineering and Architecture at the University of Parma and at the Faculties of Architecture of the University of Palermo and Sapienza University of Rome. He is active both as a professional and as a researcher in the architectural and urban design field. He is the co-owner of the MC2 Architecture Studio in Parma. Since 2007, he has been serving as President of Parma Urban Center, of which he is also the co-founder. Involved in numerous national projects for fostering education in architecture and urban design, Prof. Costi is the author of many Italian publications and an editor of two Italian book series published by MUP Editore, Parma. Since 2020, he has been the editor of the international book series "The City Project—Strategies for Smart and Wise Sustainable Urban Design", published by Springer. He is also serving as a lecturer for the Program Master Housing at Roma Tre University, in Rome, and for other Master Programs at the University of Parma, Trani, Lecce and Matera. Since 2018, he has been serving as Scientific Director of the Higher Education Courses in Urban Strategic Design at the LUM School of Management in Bari. Since 2021, as part of this collaboration, he has been developing the guidelines for the urban regeneration of Italian cities for the SNA—National School of Administration.

Giovanni Leoni (1958) is Full Professor in History of Architecture at the University of Bologna where he directed the Department of Architecture, the Doctorate in Architecture and Design Cultures and was a member of the Board of Directors. His research focuses on the theory and practice of design between the nineteenth and twentieth centuries with particular attention to models of creativity, the relationship between Personality and Anonymity and the role of architectural design in social and political processes. He edits the journals *Histories of Postwar Architecture* and *European Journal of*

Creative Practices in Cities and Landscapes (with Carole Hein, TU Delft). He coordinated, for the University of Bologna, the H2020 project ROCK Regeneration and Optimisation of Cultural Heritage in Creative and Knowledge Cities and is part of the Bologna unit of the PNRR project CHANGES Cultural Heritage Active Innovation for Sustainable Society, Spoke 7, theme: The historic Italian city as a model for sustainable urban development. He has published extensively on the themes of architecture and the city in Emilia-Romagna in the second half of the twentieth century.

Contributors

Guya Bertelli Politecnico di Milano, Milan, Italy

Marko Bertogna University of Modena and Reggio Emilia, Modena, Italy

Andrea Borsari Alma Mater, Studiorum University of Bologna, Bologna, Italy

Dario Costi Smart City 4.0 Sustainable LAB, University of Parma, Parma, Italy

Federico Diodato Alma Mater Studiorum University of Bologna, Bologna, Italy

Sergio Duretti Lepida ScpA, Bologna, Italy

Andrea Fanfoni University of Parma, Parma, Italy

Gianluigi Ferrari University of Parma, Parma, Italy

Francesco Leali University of Modena and Reggio Emilia, Modena, Italy

Gabriele Lelli University of Ferrara, Ferrara, Italy

Giovanni Leoni Alma Mater, Studiorum University of Bologna, Bologna, Italy

Roberto Menozzi University of Parma, Parma, Italy

Carlo Alberto Nucci Alma Mater, Studiorum University of Bologna, Bologna, Italy

Emanuele Ortolan University of Parma, Parma, Italy

Francesco Pasquale University of Modena and Reggio Emilia, Modena, Italy

Michele Roda Politecnico di Milano, Milan, Italy

Fig. 4 Lungo la Via Emilia (Along the Via Emilia) © Photo Alessandra Chemollo

continually opens up on the slabbing and the margin between practices and formal recognition, focusing on the dimension of precariousness and temporariness, with the tendency to become definitively temporary, that characterises this situation and that allows us to recover a porous image of the city and its potential reality (Fig. 4).

3　Home as Infrastructure: New 'Models' for Living in the Post-covid City. A Reflection by Guya Bertelli and Michele Roda

See (Fig. 5).

It sounds like a paradox to connect the concept of 'home' with infrastructure. But, among the many impacts, the pandemic pushes us to radically rethink the topic of living, with wide-ranging consequences that call into question the architecture's traditional boundaries.

In this line 'home' comes out of its singular dimension, enters a logic of complexity and proposes itself in a systemic vision as the 'infrastructure of the future': the physical, social and economic 'backbone' of a country that, in this crisis, has to find the push for strong innovation.

So, 'home'—even more the public one—redeems its own fragility, becoming the key factor

in a process that just new design actions can fill with quality.

The concept of 'home-infrastructure' is proposed as an innovative vision able of re-establishing severed ties in the direction of a strong change in consolidated relationships. A plurality of factors contribute to this dimension:

- in the first place, the necessary rethinking of housing environments, so strongly stressed in lock-down periods, which have largely revealed conditions of backwardness and inability to give effective responses to the inhabitants' expectations;
- therefore the requirement to bring the public house back to the center of thought and politics, a condition that claims a today very important jump in scale, capable of reinterpreting the home itself as an integral part of urban fabrics, in a renewed balance among public and private, among opening and closing, among nature and artifact;
- finally, the standing of a gaze oriented towards the most fragile groups of populations, both from an economic point of view and from a socio-cultural one, as the pandemic has exacerbated a dramatic request for adequate and quality social housing.

Fig. 5 Lungo la Via Emilia (Along the Via Emilia) © Photo Alessandra Chemollo

Starting from this assumption it seems possible—and promising as well—to introduce within the debate the concept of 'house-infrastructure', in a perspective that intends the project of the 'house'—especially the public one—no longer within a submissive and defensive logic, but within an open and projective vision, which looks at it as a generating principle of urban form, integrating within the consolidated habitats, regenerating obsolete areas, building new forms of participation for a society that think (and will think more and more) the domestic space as a relational place: between city and society, between built spaces and urban connective, between nature and flows. As an infrastructure, in fact.

These issues are urgent and necessary because the pandemic has shown the fragility of living and of 'house', attracting the gaze of many critics who have drawn a dramatic and unexpected condition: "*Here we are, in full pandemic from Covid-19—all inside the greatest heterotopia ever known [...]—here we are forced to see the rest of the world enclosed in the space of our own home*" (translation by authors).[1] A condition that has pushed an intense debate in architectural

culture, from which—even among very different positions—widely shared aspects have emerged:

- the absolute inadequacy of our housing assets in providing coherent responses to the renewed framework of needs;
- the centrality of 'home' in social dynamics, as a factor able of influencing the level of inequalities;
- the suffering of the real estate market, unable to offer, for some sectors of society, appropriate housing solutions, able to respond effectively to a pulverized and fragmented demand, characterized by multiple situations and by countless types of families—ever smaller, Italian or international, locals or 'nomads'.

Starting from these assumptions, it is appropriate, and necessary as well, to outline a new horizon: moving between decline and development means stressing in-between space, where global questions call for local actions and vice-versa, where inertia and resilience are the keywords. From here it is perhaps important to 'start-again'. From those situations signaling their state of vulnerability and weakness: the degraded suburbs of the 'widespread city', the abandoned spaces of post-industrialism, the interstitial areas,

---

[1] Pierluigi Nicolin, Architettura in quarantena, Skira, Milano, 2020.

the environments 'forgotten' by the most recent planning. In fact, precisely these 'intermediate territories'—marginal places or fragments of a centrality never been completed—are able to inspire, in their being perpetually in a state of potential 'contention', possible opportunities for redemption from a situation of immobility which is already settled.

In fact, it is in these marginal places that 'house' can take on a new 'morphogenetic' role since it is able to trigger «*a generative process that acts for local, limited, discrete surroundings, but induces very extensive structural changes. They affect the qualitative contents and not just the quantitative data, regardless of the dimensional scales of the intervention, since they are based on the relational links that exist between the different components of the urban framework and transcribe the polysemic nature of the space*».[2] It's a nature capable of introducing not just a relational dimension of the house itself—which in this rediscovered relationship between local and global takes on the new meaning of space 'between'—but also a dynamic vision of a significant node between the permanent condition of 'being within' and the variable condition of 'going outwards', within a continuous dialogue based on mutual correlations and interferences.

In this process, it will be necessary to re-elaborate the distinctive principles of living on the basis of new parameters of coexistence among town and society. Today more than ever, in fact, architecture finds itself the need to recover its social mandate, aimed at understanding, in the unexpected urgency, the boundaries of disciplinary ethics and collective duties. Especially for the public 'house', where the reflection must be even more intense: the dissolution of the public space within the domestic walls, together with the parallel hybridization of the private space, urgently require a rebalance of the internal-external relationship, at the moment in which the 'house' seems to take on an increasingly complex and composite form—'plural' we could say—not very open to a homologating

reduction but oriented towards the multiplication of identities.

Rather than responding to a series of goals and indicators, the 'home' of the future will have to be articulated on the basis of a complex reaction to some standards, which could be based on five dialectical pairs today strongly involved in the debate on housing:

- Sustainability/Hospitality;
- Creativity/Multifunctionality;
- Accessibility/Connection;
- Security/Inclusion;
- Adaptability/Resilience.

To conclude with the hope of a fertile outcome of the conceptual categories, we could recall various prefigurations over time aimed at exploring spatial hybridization, overcoming conventional compartmentalizations in favor of a multiple relational, communicative and participatory connective and therefore with intrinsically infrastructural requirements. From the often utopian origins in the radically innovative intentions of the layouts (so evident in the daring experiments of the Sixties) to the requests oriented to emancipation from housing shortages, to the impulses aimed at redesigning the boundaries between individual and collective spaces as social places, we can see precious testimonies of the multiple explorations of new frontiers of plural living. In this sense, it could also be argued that the golden age of Italian public housing was an extraordinary example of 'infrastructuring' of those places where today we would like to open a season of regeneration, hand in hand with the commitment to abandoned areas, urban voids, obsolete and degraded places.

What seems to gradually distinguish the most recent experiences, however, is a growing awareness of the level of complexity of the inhabited areas (in a physical-social-economic sense), especially in metropolitan areas, which pushes to the research for strategies of high spatial integration, going beyond existing diaphragmatic separations.

The challenge therefore seems very difficult today, since it is aimed at a brief recomposition of

---

[2] Sergio Crotti, 1991, translated by the authors.

Fig. 6 Lungo la Via Emilia (Along the Via Emilia) © Photo Alessandra Chemollo

the different elements competing in the definition of the concept of 'house-infrastructure', with the hope that the requests, advanced by various parties for more just, green and healthy cities (referring to the recent UN-Habitat dossier) fully involve living, and mainly the 'public house' sector.

But this is still a goal today.

'House-infrastructure' is for now a design vision, a look to the future, an attempt to update —in the face of a changed awareness of living, perhaps still too shaken to assume definitive solutions—principles and paradigms to face the new 'spirit of the time' (Fig. 6).

4   The Seventh Dimension. A Reflection by Dario Costi

See (Fig. 7).

I have entitled this paper *The Seventh Dimension* because, as demonstrated by much of the scientific literature in this field, the smart city is always evaluated and estimated through six dimensions[3], but in these categories of analysis the city of public spaces, the city of architecture,

the city of the physical configuration where the community lives is almost entirely lacking.

Joseph Rykwert told us clearly that in antiquity the idea of the city was represented by monuments and foundation rites that bound people to the city through its built symbols.[4] Today, what remains of this rite of belonging? What does the idea of the city mean today? It means having physical places that we all recognise as references of our urban identity, of our emotional relational stability.

The built city and its architecture are necessary for the city of life.

Stefano Zamagni recalled how the Romans spoke of the perfect combination of *civitas* and *urbs*, that is, between the city of souls and the city of stones, as if they were representations of a dual dimension, that of people and that of space. They are two sides of the same coin, two realities that are continuously intermingled, verified and overlaid. If we imagine returning to the concept of the city of the Romans, we must imagine a co-presence of a physical city and a city of life, of

---

[3] Francesco Manfredi, *Smart Community. Comunità sostenibili e resilienti (Smart Communities. Sustainable and resilient communities),* Cacucci Editore, Bari 2015.

[4] Joseph Rykwert, *L'idea di città, Antropologia della forma urbana nel mondo antico (The Idea of the City. Anthropology of the Urban Form in the Ancient World),* 1963, recently republished in Italy by Adelphi Milan, 2002.