

# Prosuming Public Space: the UNPark project

The role of urban infrastructures in the  
regeneration of the in-between spaces

*Paolo Carli*

*with contributions by Francesco Bruschi, Matteo Clementi, Davide Crippa, Luigi De Nardo, Barbara Di Prete, Carol Monticelli, Giulia Procaccini, Agnese Rebaglio and Patrizia Scrugli*



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## Part 2 - The UNPark's transdisciplinary approach to field research

Paolo Carli (*Editor*)

### Introduction by the Editor

*See also 1.1*

*See also 1.3*

As anticipated from the beginning of this book, it is difficult to be able to reflect the UNPark project in a linear and temporal way due to its implications on the field, its organization by Work Package, its complexity and the large number and heterogeneity of the actors involved. For example, the WPs (Work Packages) of UNPark, although defined and designed in the most logical and functional way possible, are however strongly interrelated and partially concomitant, overlapping in some respects, in charge of different members of the Team, and often interdependent in the results to be achieved. If at first glance these may seem complications - and in some ways they are -, on the other hand, they represent an invaluable wealth that finds its complete substantiation in the transdisciplinary approach of UNPark to the project and, specifically, to the project on the field. Addressing the concepts of multidisciplinary, interdisciplinarity and transdisciplinarity in an etymological sense is not one of the objectives of this introductory text.

However, it is important to underline how UNPark, understood as a group of researchers from different studies, has always tried to “transcend” the boundaries of individual disciplines thanks to a participatory approach with the most diverse civic subjects, aimed at

achieving common objectives, such as a culmination and goal of previous interdisciplinary efforts expressed, for example, in the various WPs.

See also 1.3

The transdisciplinarity of this research project is therefore not a spontaneous and intrinsic characteristic, more or less conscious, but a well-considered choice of approach with respect to a theme, that of the urban public space and its possible transformations and evolutions, in the spirit of the Terza Missione dell'Università (University's Third Mission) to *“foster economic growth, through the transformation of the knowledge produced by research into knowledge useful for productive purposes”* (ANVUR, 2014, page 4).

UNPark recognizes itself and has always recognized itself in the shared need to connect all disciplines in a coherent whole, since the field of sustainability is essentially transdisciplinary (McGregor, 2004).

More roughly, it can therefore be said that the transdisciplinarity of UNPark is an interdisciplinarity with the extra ingredient of public engagement, in the spirit of *“building a scientific democracy to help ensure that knowledge becomes an active factor of inclusion”* (Cognetti, Pasqui, 2018, page 28) of the Polisocial program, which funded the research.

This Part 2, very different in structure from the previous one and from the final one, through thematic chapters, written by members of the UNPark Team, pertaining to sometimes very distant research fields, has the objective of trying to give back to the reader this transdisciplinarity which, in addition to pervading the UNPark research itself, is also one of the most interesting results achieved. The UNPark/FREESTYLE pilot project in the field, preceded by its prodrome MUE:SLI, is in fact a more than concrete manifestation of it.

It is in this space, both physical and theoretical, that the

Conferenza delle Regioni e delle Province autonome Roma, 27 marzo 2014. La valutazione della terza missione delle università [https://www.anvur.it/wp-content/uploads/2015/10/91.Conferenza%20Regioni\\_te~.pdf](https://www.anvur.it/wp-content/uploads/2015/10/91.Conferenza%20Regioni_te~.pdf)

McGregor, S. L. (2004). *The nature of transdisciplinary research and practice*. Kappa Omicron Nu human sciences working paper series.

Cognetti, F., Colombo, E., Pasqui, G. (2018), *“Verso un modello Politecnico di ricerca responsabile”*, in Broz, M. (Ed) *Polisocial Award. Esperienze di ricerca*, Poliscript, Milan. <https://re.public.polimi.it/retrieve/e0c31c0f-25a1-4599-e053-1705fe0a-ef77/Cog-Col-Pas-Esperienze-di-Ricerca-Responsabile-estratto.pdf>

interdisciplinarity, typical of urban environmental design, has become transdisciplinarity thanks to the inclusive relationship, in all phases of the research, with the stakeholders and their disruptive needs and requests. And it is precisely in the transdisciplinarity, necessary as a glue for a very varied Partnership, that the UNPark project has identified the urgency of a higher level of citizen participation in the choices relating to the city and their subsequent management: the prosuming of public space. But not only. In fact, this Part can also be read as a story in episodes, by specific essays, in which the main themes of UNPark are carefully articulated, discussed, analyzed and explored. An attention to which is added the awareness of a work now completed, of which both the achieved results are known, but above all the critical aspects that, in the future, each researcher belonging to the UNPark Team will be more inclined to take into consideration and deepen. The Part 2 is organized into three major themes, both to allow an understanding of the areas and sequences of the UNPark research activities, and to be able to evaluate their weight and impact on the overall economy of work; and they are all anticipated by a short abstract with keywords that summarize the contents. The three themes are:

1. public space, i.e. the new needs of the city after the pandemic, co-design as a tool of the transdisciplinarity necessary for post-pandemic urban design, and the most interesting international interventions for the multifunctional approach of UNPark to the regeneration of the urban infrastructures;
2. local resources, whether social or environmental, and how to exploit them and put them into a system to achieve the goals of UNPark through strategies of inclusion and facilitation of citizen participation in the co-design phases of the project,

*See III by Carli and  
Rebaglio; IV by Di  
Prete; V by Scrugli and  
Procaccini*

and the relevant techniques and methodologies for surveying local potential;

3. methodologies and medium and long-term intervention strategies on the Serra – Monte Ceneri Overpass, and the relative possibilities of contamination for transdisciplinarity, in a perspective of urban metabolism and for the recycling and direct reuse of scraps and waste.

*See VI by Rebaglio;  
VII by Clementi  
and Bruschi; VII by  
Monticelli and Scrugli*

According to the holistic principle that presides over the city and all the disciplines connected to it, this Part too cannot be reduced to the mere sum and logical succession of the chapters that compose it. At the same time, however, the Part 2 wants to return in a schematic and above all thematic way, with the partial exclusion of the first three chapters, the operational points of view of the various authors in the broader container of the UNPark project, and in particular of its pilot project on field.

*See IX by Procaccini  
and Monticelli; X by  
Crippa, Di Prete and  
De Nardo*

Above all, this Part has the credit of bringing the scientific and academic dimension back to the center of the practical questions encountered during UNPark. Indeed, it is in this second Part that the scientific point of view on UNPark and on the wake of the interventions on the city in which it is inserted, is mainly structured through international references and innovative practices. Since it is a risk of field research to lose the methodological and technical-scientific reference points, due to the pushes from the citizens that can be received. An essay written downstream of the project, instead, allows you to look coldly at the data and concrete facts, placing them in a framework already explored by others, and allowing you to draw the final conclusions, as well as an overall balance of the experience. These are therefore the reasons and the opportunities for which it seemed useful to insert the ekphrasis of Part 2 into the narrative thread intertwined by Part 1 and Part 3.

### III. Post-pandemic trajectories of work in the city and public spaces

Paolo Carli and Agnese Rebaglio

During the Coronavirus emergency that we are still navigating (summer 2022), public space, despite having the quantitative capacity to withstand the impact of the pandemic, has not proven to have the flexibility needed to accommodate and put its new usage requirements in order. It is therefore essential to interject, as soon as possible, to bring elements of flexibility, organisation and optimisation to public space within the design of the city, which require the engagement of its citizens, above all in its management. This contribution identifies, through both pre and post-pandemic examples and international research, certain trajectories of work for the coming years, with regard to the need to define new standards for indoor and outdoor design and new models for activity in public spaces, in order to render them more practical and create the vision of the “15 minute city/neighbourhood”, as a possible healthcare facility to combat future episodes of infectious disease by way of the flexible and adaptive design of public space, in which multifunctional regeneration of infrastructure could have a more important role.

### III.1 INTRODUCTION

The great challenges that modern cities have recently faced, such as the health challenges linked to the pandemic and the related social and economic crises, are added to those of the last twenty years that are linked to the progressive urbanisation of the landscape, constant demographic growth in the urban environment and the increasingly serious environmental crisis (Florida, R., 2021). In a wider context characterised by an increase in urban “density”, both social and of the built environment, and the emergence of new models of behaviour and of community life, which are naturally also conditioned by the recent health and environmental emergencies, addressing the issue of public space design in cities has become critical to the pursuit of sustainable urban development. Indeed, on one hand it is becoming increasingly apparent that there is a need to maintain an adequate amount of public space in light of the essential role that it plays in policies combating environmental and health crises, air pollution and climate change (Kakderi, C., 2021). On the other hand, particularly in the current urban landscape, there has been a notable emergence of the need to ensure a different environmental quality in public space, equipping it to satisfy the increased demand and the new and more flexible ways in which it is enjoyed and interpreted by its users (Bliss, 2020). The concept of “public space” has been widely defined in relation to its provision not so much of a space resulting from construction but rather as a place of significance for the collective, which is accessible, comfortable and safe, capable of encouraging social relationships and, lastly, as an expression of a cultural and natural heritage that feeds into the collective identity (Gehl, 1980; Purini, 2007). In this sense, the design of public space has always been strongly linked to a cultural and local

dimension, on one hand representing a political idea of the city in the processes of urban and environmental development, and on the other being an expression of models of social and individual behaviour. However, the complex situation that cities and their officials find themselves facing today as a result of the speed of the changes in collective needs has called for a wide-ranging and global reflection on culture, politics and design with regard to the management and planning of the role of public space. Within a context which obviously feeds on globalised processes, examples and strategic objectives of development have become increasingly common and widespread in recent years, together with specific administrative devices, design tools and participated processes, in order to promote semi-local forms of accommodating, safe public spaces that are capable of encouraging social relationships, free expression and an active life for all sections of society. The culture of design in this field has established itself in its technical competency, tackling design from the perspective of the equipment, the services and the materials, with priority given to the themes of environmental and economic sustainability. Further to this, skills have been developed in the management of the immaterial aspects, of image and orientation, of flexible use and “comprehensibility”, of digital connectivity and multimedia interaction, in an increasing augmented dimension of the physical space. Lastly, it is also already widely accepted that there is a need to adopt approaches that involve a multidisciplinary contribution, which may be accompanied by participatory, inclusive processes that are open to creative input and management by the communities of residents and users. Cities however, with their active, involved and increasingly interconnected populations, in addition to being centres for the production of goods and services, hubs for the flow of goods and terminals for

infrastructure networks, are notably the places with the highest levels of resource and land consumption, of air, water and ground pollution, of waste and refuse production, of overdevelopment of land and natural river beds, with the consequent loss of elements of biodiversity and natural factors for the protection of the climate and the environment.

These issues were suddenly exacerbated with the advent of the Covid-19 pandemic which, as we know, impacted urban environments significantly. It is understood that the extreme population density of cities, which inevitably leads to a high frequency of movements of people and goods and contacts, as well as the high level of air pollution proved to be crucial factors driving the propagation of the virus with serious consequences for human health (Brunekreef et al., 2021). The pandemic effectively acted as a catalyst for environmental issues but also those of a social and economic nature and led us to urgently reconsider the way in which we design cities, taking the opportunity to promote more inclusive and sustainable forms which are capable of protecting public health, without having to abandon the idea of the city as a centre for socialisation and development (Lambert, H. 2020). The dramatic situation that we have experienced in terms of the loss of places of connection has however motivated us to imagine innovative and experimental services and forms of use for the reappropriation and use - both individual and collective - of urban space, accelerating certain reflections and initiatives that were already underway (Curci, Pasqui, 2021; Balducci, 2022). Indeed, the crisis has shone a light on the conversation about the value of urban spaces, whether these are outdoor urban spaces or the so-called "third spaces" that proved to be key factors in the process of liberation and reappropriation of the city and of social life, albeit in a different, "distanced" and protected manner. Moreover, it brou-

ght everyone's attention to the matter of the accessibility of space, or rather the "right to space" itself as an essential part of democracy (Lefebvre, 1970). Above all, in large cities where socio-economic inequalities are intensified and people live in homes with smaller dimensions, the availability of outdoor spaces in which to spend time, meet people, feel free to express ourselves and the presence of green spaces in which to feel well and healthy restored value to those public spaces which can no longer be places of transit, but special instruments for "social resilience" (UN-Habitat, 2020). We can therefore perhaps assert that many trajectories of reflection and innovation within the design of spaces in the city may have arisen from this experience, some of which have already been experimented with in the field and codified in policies and practice, which we will attempt to illustrate in the following section.

### **III.2 (POST-)PANDEMIC PROSPECTS: TRAJECTORIES OF ACTION AND INNOVATION**

During the most intense period of the pandemic, "*We will come out on top*" was one of the slogans widely used as encouragement or a warning, although probably in vain. However, it is true that - in the disciplines that address the design of the city and its services - a great deal of energy was spent trying to identify opportunities for innovation based on recent lived experience, looking at sustainability and public health with new perspectives and new objectives (Armondi et al., 2022). The first potential trajectory of work is that which promotes, as was mentioned in the opening, the enhancement of public space as a collective resource within cities, in proximity to the communities by which they are populated. In the face of the new needs (in terms of health, social connections, sustainable beha-

viours, etc.) that came to the fore during and after the pandemic, the planning and design of cities have had to adopt updated visions. Among the areas that have been urgently placed on the political and planning agenda, alongside urban transport, communications between cities and the regulation of the movement (of people, goods, energy, etc.), the management of the economic and social crisis after the health crisis (Martínez, Short, 2021), there is certainly also the theme of the transformation of urban public space as a place in which to re-establish social relationships and to return to doing activities in a manner that conforms to safety and public health measures. The ever-increasing scarcity of “space” as a resource in urban areas also compels us to cast a fresh eye over those spaces that are normally considered to be “unusable”, such as areas produced by large urban infrastructure and monofunctional infrastructure, brown-fields and the undefined scraps which do not have a function in the consolidated urban fabric, the so-called in-between spaces, but also roads themselves (laybys, squares, boulevards, etc.) and car parks.

It is therefore a matter of fully embracing that approach, which has already been mentioned and which evidently the environmental and climate crisis were not sufficient to make urgent and emerging, founded on the principle of “doing more with that which is already available”, exploiting the existing but “underperforming” elements of our cities as much as possible, avoiding, if not strictly necessary, the consumption of further spatial, environmental and economic resources by building new structures and areas (Boeri, Berni, 2012; Burnham, 2018). In particular infrastructures for vehicular mobility, including their “manoeuvring spaces” (such as access ramps, underpasses, the underlying spaces, safety zones, etc.) and, by extension,

roads and car parks represent, for a resilient and adaptive city, a reserve of spaces and possibilities which is yet to be fully explored. A promising reserve, both in terms of the reappropriation of areas for different uses that provide benefits and/or social use, in terms of environmental quality and urban comfort, as an opportunity to insert elements of Nature-Based solutions (NBS), Sustainable urban Drainage Systems (SuDS) and in terms of other urban features that can be used to combat the effect of the climate crisis, making some of these underexploited, monofunctional spaces “useful”, if not usable. If the strategies mentioned above are nothing new, insofar as they have been urgently needed for years and yet largely ignored, there are instead new ways in which citizens feel compelled to engage, not only with the decisions of the composition of public space, but also with its management. Likewise, there has never appeared to be such a large consensus as there is for municipal administrations to experiment with new solutions and new processes in governing cities. Indeed, since the 1970s, there have been grassroots movements for the reappropriation of the city through informal interventions of self-construction, the depaving of roads, guerrilla gardening, squatting in abandoned buildings and the temporary occupation of public spaces as a form of political protest and criticism concerning the right to freely enjoy the city and a more sustainable and inclusive design of the same (absence of nature, exclusion/segregation, difficulty in accessing the property market, pollution, cost of transport, soft mobility, social injustice, etc.). Today, the same, yet more topical examples that animated these movements find new life in the Information and Communication Technology (ICT) that allows for simpler forms of practical organisation and interaction, while at the same time being equally effective and less burdensome, in addition to reaching much wider

audiences of support and potential new participants (De Chiara, 2013). Social streets, shared gardens, urban allotments, neighbourhood apps, flash mobs, temporary installations and all those local initiatives that converge under the umbrella of “placemaking” are the result of a new spirit of participation, sharing and taking responsibility, with ICT making it simple for anyone to take part according to his or her level of engagement, expertise and experience in the field.

Once more, it is a matter of exploiting an urban resource that already exists but often goes unrecognised, that is the “local knowledge” of citizens who, if involved in decision-making processes transparently, in addition to being the beneficiaries of public space, may be: “stakeholders”, precisely because they know the neighbourhood better than the designers, with its issues to be untangled from its potential; “facilitators” that, given their social relationships in the neighbourhood, can create a consensus around initiatives and projects; perhaps even “managers/constructors” at times, considering that participation in the processes, in addition to generating a sense of responsibility, often activates previously unexploited synergies in the neighbourhood which are merely waiting to be liberated. Even the second trajectory of work on public space as a strategic tool to improve urban resilience in the face of emergency crises, as identified by this paper, is closely linked to the relationship between citizens and public space, both on a local, neighbourhood and city-wide scale. Indeed, direct observation and monitoring of the use of urban space in the post-Covid period demonstrate a general increase in the frequency of access and the presence of a wider, more differentiated range of users (Gehlpeople, 2020). During the reopening phase, public spaces in many cities globally were extended in order to encourage more pedestrian areas and slow mobility (Sisson, 2020) and, statistically, the number of

people that used them and the types of activities carried out in them increased. In particular, we can identify certain general dynamics which became consolidated trends. During the various lockdowns, the need to minimise the movements of people and the prevalence of remote working resulted in a renewed appreciation of local areas and, through the promotion of services and opportunities for interaction in greater proximity to residents, a “place attachment” was generated for spaces that had scarcely been considered previously. Certain, less central parts of the city became popular and development guidelines that favoured a decentralisation of the city, or rather a poly-centralisation, were drawn up and promoted. Models such as “the 15-minute city” (Moreno, 2016 and 2021) promote more sustainable timescales and ways of life, reducing the need for long commutes and attributing greater value to the proximity of primary services and the quality of urban space close to residential properties, calling for the need to design and care for even the smallest and most neglected spaces in neighbourhoods.

The numerous programmes aimed at taking space away from vehicular traffic in favour of pedestrian space, which find even stronger support from local administrations after the pandemic, are moving in this direction, responding at the same time to global, environmental and climate pressure but also unprecedented social pressure for safe, outdoor spaces nearby in which to live and meet. Indeed, on one hand, in order to encourage the recovery of the so-called “third place” which suffered greatly during the pandemic because of the necessary reduction in interactions between people (Volpe, 2021), the use of space adjacent to the ground floors of commercial properties and tertiary services was permitted, with such space being diverted from car parking for example. On the other hand, the spread of outdoor recreational and sporting activi-

ties has been witnessed, which has encouraged installations and innovative equipment suited to the new demand. A new world of objects has therefore spread across the city - mobile seats and tables, herbs and flowerpots, modular platforms, small, light canopies, equipment that can be freely adapted, etc. - which increasingly resembles the soft, reversible urbanisation anticipated by Branzi's visionary capacity (Branzi, 2016). Not only that: the need to implement transformations quickly and in an economically sustainable manner also favoured the adoption of projects and programmes comparable with that which is already universally recognised as Tactical Urbanism. The softness - understood as distancing itself from "hard", permanent initiatives of construction - and reversibility - understood as the flexibility and adaptive capacity which is now indispensable in responding to increasingly rapid changes to social and emerging requirements - is increasingly united with a collective accountability for the intervention project. The "tactical square" is no longer the experimental transformation of a place in order to test its efficacy but, more importantly, it is the result of a journey of sharing, engagement and participation by the "user-residents", for the purpose of cultivating the fabric of relationships "of proximity" (Manzini, 2021) which is necessary to fuel the resilience of communities in the face of crises.

### III.3 TACTICAL URBANISM. THE CASE OF MILAN

Tactical Urbanism, a specific term which over time has acquired increasingly generic meanings, owes its current moment of greatest dissemination and application, as is well known, to the programme launched in the city of New York, during Michael Bloomberg's term as mayor, of which Janette Sadik-Khan was a suppor-

ter in her capacity as Commissioner of the *New York City Department of Transportation* (2007 -2013), with the aim of renewing the sense of belonging and connection between people and public space, taking it away from cars and restoring it to pedestrians through soft transformation interventions, often using graphics, which were easy to implement and reversible. Even before the pandemic, therefore, the relationship between citizens, public space and neighbourhood was already the focus of many studies and interventions concentrating on returning space and urban facilities to pedestrians where these had previously been reserved for private vehicles and, in particular, on-street parking. Indeed, three recurring themes can be identified from the various Tactical Urbanism interventions seen in recent years in many North American and European cities:

1. the highly local and small-scale approach;
2. rethinking the relationship between pedestrians and cars;
3. the direct participation of citizens in the processes of transformation of the spaces (Lydon, Garcia, 2015).

In addition, it is also possible to recognise Tactical Urbanism from its aesthetic and functional features, which derive both from the affordability of the materials used and the expertise and skills of the constructors, or the active citizens, as well as the rapid reversibility that the test-projects must have as a necessity. As this second Part of the book will explain, Milan has stood out the most among European cities for its application of this type of intervention. Indeed here, after several experimental projects were implemented by means of the Collaboration Agreements between municipalities and citizens (associations, business owners, schools, etc.) starting in 2016, as well as two contested editions

of the Participation Budget (2015/16 and 2017/18), the 2019 “Piazze Aperte” (Open Squares) programme was launched in each neighbourhood, thanks to a collaboration between the Agenzia Mobilità Ambiente Territorio (AMAT - Agency for Mobility, Environment and Territory), Bloomberg Associates and Global Designing Cities Initiative. With its aim of *“bringing back squares as central places in neighbourhood life, no longer just car parks and areas that are passed through, but rather areas to enjoy and in which to live, where the Municipality of Milan and its residents actively collaborate in both the practical implementation and the programme design”* (Municipality of Milan 2022), in recent years the call has received more than 65 proposals for new spaces to be transformed and has supported around 35 projects, proof of the citizens’ desire to play a leading role in the city’s urban agenda.

Driven by new usage demands and new urban behaviours, including those brought about by the pandemic, the municipality began a radical journey of innovation in its methods of transforming the city, going so far as to create a new department “Laboratorio Officina Urbana” (Urban Workshop Laboratory) within AMAT, the Municipality of Milan’s planning company dedicated specifically to the research and design of public spaces. The UNPark experiment also sits within this global and local journey, although it represents a stand-alone case, both for the uniqueness of its location and the environmental and social challenges of the setting that was chosen. During the pandemic, given its immediate, rapid and soft nature, Tactical Urbanism became even more relevant, enabling rapid reappropriation of public space on streets by pedestrians, both for the construction of parklets for the sale of food and drink, attempting thereby to support the survival of these businesses during the health emergen-

cy; and to facilitate travel by bicycle (or other similar means) by plotting dedicated bike paths using only signage in order to avoid overcrowding of public transport and limiting the incentive of using private motor vehicles due to the fear of infection. Likewise for example the Open Streets project, again in Milan, which is part of the Area Zoning Plan to 2030, has enabled the creation of new cycle paths, also using signage only, an increase in 30km/h zones and the number of residential streets with predominantly cyclist and pedestrian access and the expansion of pedestrian routes and walkways (Comune di Milano, 2022). Regardless of the quantitative and qualitative results achieved, the Open Squares project, like the 2015/16 and 2017/18 editions of Milan's Participation Budget, have had the undeniable virtue of putting citizens at the centre of urban design, as well as communities and all those improvised efforts on the ground that are capable of organising themselves in order to support practical intervention proposals. However, many issues were encountered in these strategies of resident engagement on small interventions and very local matters, an attempt to divert attention from much larger projects of renovation and transformation of parts of the city, often to the detriment of the enjoyment of public urban space (Graziano, 2021). Likewise, citizens submitting proposals had many expectations and were often frustrated by the timescales of urban planning and, above all, its costs. A case in point would be the project proposed in the 2017/18 Budget for a cycle path on the Ghisolfi Bridge which, despite receiving many votes and much support, continues to be absent from the agenda because of the cost of its creation and previously unforeseen technical and bureaucratic issues (please refer to this book's closing Chapter XI in the Part 3). These experiences, like many other international experiences in London, Berlin, Bogotá, Minneapolis, Vancouver,

Mexico City, Dublin and across New Zealand (Daly, Dovey, Stevens, 2020), together with the experience on the ground of the UNPark research project - as we will see in this Part 2 - all clearly demonstrate that citizens want to participate ever more actively in the design of their cities, since, because of the pandemic, they have learned that public space, whether this may be a park, a square or even a car park, is an integral part of their habitat, an extension of their private space in which to carry out certain activities and of which to take care.

### III.4 CONCLUSIONS

The glaring omission among these work trajectories is the integration of new technology in the city. A crucial role could be played by new technologies from the “Internet of Things” (IoT) in the transformability, if only temporary, and flexibility of squares, infrastructure, streets and car parks, providing users with real-time information: for example, where parking spaces are available nearby (smart parking) thereby reducing their vehicle emissions or, in a more structured manner, autonomously changing the road network both physically and through dynamic signage, on the basis of the most prevalent type of user at a given moment (on-demand). There are many possibilities for the integration of information technology across urban elements and users: from real-time assessment of air quality in crowded areas, parks, etc. through sensors; to the monitoring of noise levels, as a measure of potential issues (accidents, fights, burglaries, vandalism, etc.); to traffic control, which is already partially in place, with a view to reducing congestion and CO2 emissions; to energy consumption, in order to obtain a complete estimate of the energy requirements of various urban services so as to better plan consumption;

to smart lighting, that is varying the brightness of street lighting depending on the time of day, the weather conditions, the presence of people, the temperature and humidity, in order to ensure optimal levels of outdoor comfort and energy savings (Cicirelli et al., 2019). However, these new urban possibilities can only be unlocked through the creation of design ecosystems based on technology, innovation and the participation of citizens, which can be applied to streets, urban infrastructure and public space that, from fixed elements in the urban panorama, can be transformed into adaptive and responsive environments capable of changing, accommodating different flows and functions according to demand, putting the pedestrian at the centre of all urban decisions, thereby remodulating the dimensions of areas dedicated to vehicles. Indeed, as was demonstrated during the pandemic by the limitations imposed on private motor vehicles, too much urban area has been dedicated to car parking to the detriment of more universal and democratic uses (Clemente, 2017; Coccia, 2020); without forgetting, moreover, that 23% of greenhouse gases in Europe are produced by transport; and that road traffic represented 72% of the total CO<sub>2</sub> emissions by the transport sector in 2017 (European Environment Agency, 2020). The potential pool of new spaces to be regenerated offered by streets and mobility infrastructure, the rapid strategies for intervention by tactical urbanism, the new centrality of the pedestrian as a foundation of viability and the development of urban IoT technologies are therefore the four elements that need to be integrated in order to overcome the urban challenges of the coming years, with the aim of learning to design the temporary, to alternate between functions and users, and the multifunctionality of urban spaces, structures and infrastructure, in order to avoid their disuse and consequent deterioration. If in

the pre-pandemic “global” city “quality” public space was that of the city-centre resident, of great works of recent urban transformation, of fashionable streets for shopping and “movida” (nightlife), - in short - of those urban places in which it is more important to communicate quality through images than to enjoy them freely and informally (sit down, socialise, eat, etc.); in the inclusive, post-pandemic 15-minute city, the prospect of public space will be completely overturned and with it will come a local vision of neighbourhoods as part of our daily habitats, which immediately becomes more attentive to the areas around us, their strengths and weaknesses, as well as interrogating the inequality of the facilities and services from one neighbourhood to another, in order to ensure, in practice, the implementation of a 15-minute city.

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