ESTRATOS ACTIVOS

CLIMATE AS AN OPPORTUNITY FOR MÁLAGA'S RIVERSIDE

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SAMUELE FOLLI

Supervisor
Nicola Paolo Russi

Co-supervisor
Federico Coricelli

Contributor
Susana García Bujalance

In a particularly vulnerable context such as Spain, the effects of climate change are no longer a distant threat, but a reality that must be faced every day. Therefore, the design of architectural devices capable of adapting cities to environmental factors is a priority that must be taken into account.

This thesis work identifies this need as an opportunity to rethink the public space of cities, and vice versa, investigating how this relationship can be translated into occasions for projects at the urban scale. The issue of climate change is therefore addressed in a proactive and broader way than the current trends, that see it as a simple problem looking for a solution, placing mankind and the way people live the spaces of cities at the center of the debate.

Estratos Activos is the strategy developed, starting from this premise, for redefining the spaces along the Guadalmedina River in Málaga. Through this case study, the perfect combination of an important unsolved urban space and a series of environmental criticalities, it is indeed possible to experiment with new ways of designing the city in relation to the new climate condition.



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FOREWORD

This thesis focused on the possibilities of rethinking the public space of cities in relation to the need to mitigate the effects of climate change. In order to do that it proposes a series of reinterpretations, both of the spatial features and the cultural connotations, of the city of Málaga, chosen as a case study, and its most important river, called *Guadalmedina*, which is an interesting exception within its architectural panorama. The point of view for these observations is interscalar, passing from the definition of strategic maps at the scale of the city to the study of singles elements at a more detailed scale. The research process, which leads to the definition of one of the many strategies possible for this specific place, therefore constitutes a more or less orderly sequence of analysis and considerations, that move freely between the various topics covered and address them as different focuses of a single larger theme. The approach that underlies these readings is, finally, proactive and not analytical, combining each consideration with a possible implication from the design point of view.



" In other words, we need to view the fragility of the planet and its resources as an opportunity for speculative design innovations rather than as a form of technical legitimation for promoting conventional solutions. "

Mohsen Mostafavi, *Why Ecological Urbanism? Why Now?*, in Mohsen Mostafavi, Gareth Doherty (edited by), *Ecological urbanism*, 2010

01

INTRODUCTION

ABOUT CLIMATE CHANGE

The average global temperature has been affected, from the mid-nineteenth century to the present, by an increase of about 1.2°C.[1] To understand the gravity of the phenomenon that we all know as global warming and that is hidden behind this seemingly insignificant figure, it is enough to compare it with those relating to previous centuries. Although the global average temperature measurements began in 1880, in fact, it is possible to get an idea of the ones of the previous centuries thanks to values estimated from natural elements such as trees, rocks and corals. Looking at the graph that represents the trend it is easy to see that we have passed from variations in the order of tenths of a degree, which have followed in the last millennia, to values ten times greater in a little more than a hundred years. This is because the natural oscillatory trend of temperatures has been replaced, in the last century, by an abnormal and exponential trend, which has led to a progressive and increasingly faster overheating. Just think, in this regard, that global temperatures from 1880 to the present

1. *Journal of Geophysical Research: Atmospheres*, in *www.metoffice.gov.uk*, 2020

day have increased at an average rate of about 0.1°C per decade, while since the eighties of the last century every decade has been hotter than the previous and the hottest ever, with variations in the order of almost two tenths of a degree per decade.[2] The consequences of this global warming are, to date, partly already visible and have an impact that affects the entire planet. Phenomena such as glacier melting, rising sea levels and ocean acidification are only some of the consequences of rising temperatures and, affecting all the different environmental sectors, they're called climate change.

2. R. Lindsey, L. Dahlman, *Climate Change: Global Temperature*, in *www.climate.gov*, 2021

Looking at the causes that have led, in the last hundred years, to upset the natural balance of temperatures that lasted for millennia and to generate these new imbalances of climate nature, it is clear that the human action has played a fundamental role. From the end of the nineteenth century, in fact, with the advent of new technologies such as the internal combustion engine and electricity, mankind began to produce and inject polluting gases into the atmosphere, unaware that these would generate, of them shortly, the so-called "hole in the ozone" and the consequent global warming. It is not by chance that this recent historical period has been defined, though not officially, as *Anthropocene*, or rather the era in which the human species has begun to influence in a meaningful way the environmental equilibrium of the planet.[3]

3. AA.VV., *Climate Imaginaries*, in J. Graham, C. Blanchfield, A. Anderson, J. Carver, J. Moore, *Climates: Architecture and the Planetary Imaginary*, Lars Müller, 2016, p. 9

Recently, a wide literature has addressed the theme of changing environmental factors, analyzing their causes and consequences, in the constant search for ways of countering their effects. However, given the scale of this phenomenon and the degree to which it has already influenced the environmental balance of the planet, it can be said that climate change is no longer a problem to be solved, but a new condition to live with and relate to, destined to change the way we think about ourselves, our society and in general the role of the human being on Earth.[4] Talking about climate change, in fact, no longer just means approaching a technical question, through measures, observations and

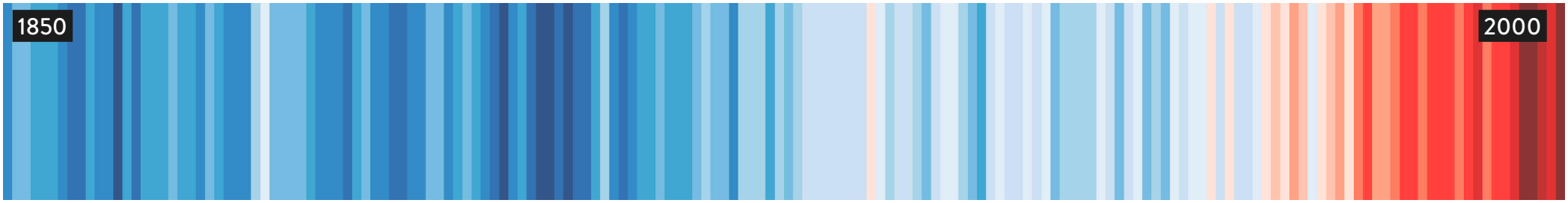


FIG. 1 Ed Hawkins, *Warming stripes*. The chart intuitively shows the rise in temperatures from 1850 to 2000.

analysis of data, in order to find a solution to the problem; on the contrary, it must be recognised that it is an intrinsically linked phenomenon to the political, social, cultural and economic factors of our societies and that, as such, is not reversible. Therefore, we can only consider it as part of the equation; its elimination is no longer the goal, but rather the adaptation to this new condition and the search for ways in which it is possible to mitigate its effects.

Taking these considerations as a starting point, this research work focuses not so much on climate change as a global phenomenon, but rather on the relationship between its effects and the ways of living space within specific places. On the other hand, climate change is both a large-scale phenomenon and a set of small-scale factors, determining substantial transformations of space both from the urban and territorial point of view and from that of the smallest interventions on the built and open spaces. Departing from the analyses and numbers, which describe it with great precision, the focus is then shifted on the mankind and the ways in which we can and must transform our habits in order to adapt to this new climate condition, generating a series of questions of an architectural nature. How can the project relate to this new condition? How can architecture support this radical change in the way we live our spaces?

4. M. Hulme, *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, 2009, pp. 41-42



FIG. 2-7 Patricia Corcoran, Kelly Jazvac, *Plastiglomerate samples*. The series of plastiglomerates, collected in Kamilo Beach, Hawaii, can be assumed as the evolution of rocks conglomerations and represent the materialization of the *Anthropocene Era*.

CLIMATE OPPORTUNITY

Nowadays, after having become aware of the problem of climate change and its repercussions on human beings and societies, at the heart of the debate are the strategies to be applied in order to minimise its impact. Although it is now impossible to reverse the trend of temperatures and return to the pre-industrial condition, in fact, there are solutions that would significantly slow down the rise in temperatures and limit the damages caused by climate agents. Based on these strategies, and as far as we will be able to implement them, two different scenarios have been developed. The first takes into account the possibility of national governments committing themselves to work together with a view to slowing down the ongoing global warming process; this scenario goes hand in hand with the agreements reached in Paris in 2015 which, if respected, should lead not to exceed the established threshold of a rise in temperatures (always compared to the pre-industrial period) of 1,5°C. Despite the last limit not

to be exceeded in order not to have irremediable consequences for the human species was, according to the scientific community, of 2°C, it was in fact decided to fix a lower one in order to protect, even if only partially, countries most vulnerable to environmental factors. On the other hand, if temperatures will be kept below the limit, the second scenario will be reached, where the effects of climate change will become such as to impair the survival capacity of the human species, first in certain specific areas of the globe and subsequently throughout the world. *"Dry apocalypse"*[1], widely treated in literature but also in film, is nothing more than an attempt to imagine what will be the consequences for mankind and, more generally, for life on the planet as a result of too high a rise in temperatures.

Noting that climate change is not a problem in search of a solution, but the new condition that characterizes life on earth and, not being reversible, that is bound to continue to be so in the future, we must ask ourselves how we should act in relation to it. Given the permanent nature of the phenomenon, in fact, it is clear that, since we cannot cancel its effects, we must learn to live within them. In the architectural field this implies the need for a total revolution of the design concept, with the inclusion of climate factors as a fundamental element to be taken into account when designing new buildings and new cities. Consequently, a revolution is also needed in

1. J. Boswell, *Notes from the Wasteland: Competing Climate Imaginaries in the Post-Apocalyptic Landscape*, in J. Graham, C. Blanchfield, A. Anderson, J. Carver, J. Moore, *Climates: Architecture and the Planetary Imaginary*, Lars Müller, 2016, p. 41

/ RESILIENCE

Capacity of a place to restore its previous state of equilibrium after a disaster, absorbing changes of different kind of variables and still persist after that.

/ MITIGATION

Sum of strategies that reduce carbon dioxide equivalent (CO2) emissions and other human activities' effects with the aim to avoid the worst consequences of climate change.

/ ADAPTATION

Recognized the impossibility to prevent all the climate change's effects provides a series of policies and design strategies able to reduce their impact on cities and human life.

technical language: words such as resilience, adaptation or mitigation are, in fact, destined to be increasingly present within our vocabulary when we speak about architecture.[2] The first is a condition of a place or an object, as such can be linked to its natural essence. The others, differently, are consequencies of the human action, made up in order to face the looming climate emergency.

2. A. McGregor, F. Cousins, S. Cole Roberts, *Two degrees: the built environment and our changing climate*, Routledge, 2012, pp. 49-53

If you consider, then, the link between these new strategies of space conception and architecture, it is possible to reverse the view that climate change is nothing but a critical factor and propose a more positive view. In this sense, it can be imagined as an opportunity, rather than a constraint, for the project. Starting from the need to adapt cities to the new environmental condition, in fact, it is possible to seize the opportunity and rethink those spaces that to date are, for the most disparate reasons, in conditions of degradation and neglect or that simply constitute unresolved places, redefining not only the spatial qualities, but also the relations people have within them, according to principles recognized today as fundamental such as sustainability and equity.[3] Climate change, in relation to the architectural project, can therefore be an engine for the regeneration of parts of cities that, regardless of the environmental emergency, are in critical situations and for the rethinking of the ways of life within them.

3. N. Cramer, *The Climate Is Changing. So Must Architecture*, in *www.architectmagazine.com*, 2017



FIG. 1 Frame taken from the first scene of the film *Mad Max: Fury Road*, directed by George Miller. The recreated setting represents the contemporary imagery of the *"Dry Apocalypse"*, within a world complitely desertified and in which it is difficult to survive.

CITY AS THE BACKGROUND

The city is, and always has been, the physical place in which most of the human activities are concentrated. From a commercial hub to a productive one, from a private home to the centre of public life, the city is the social and economic core of every culture, defining itself starting from the functions that take place in it. But not only: taking the words of Italo Calvino, the city is *"a combination of many different things: memories, wishes, legacies of its people."*[1] In addition to an urban agglomeration, defined by its spatial and formal characteristics, the city is in fact the embodiment of the identity traits and cultural connotations of a people. As such, it has developed over time following the various social, economic and technological changes, transforming accordingly and adapting to them. This is the reason why, over the last century, the city has undergone a substantial revolution that led to be the *"dominant geographical context for life on earth"*.[2] As a result of urbanization

1. I. Calvino, *Le città invisibili*, Giulio Einaudi Editore, 1972, Preface (own translation)

processes, or rapid expansion of urban space and infrastructure, the city has in fact begun to cover more and more areas of land and, as a result, to concentrate more and more people inside. As of 2009, more than half of the world's population lives in cities and the trend does not seem to change, so that according to recent estimates by 2050 there will be about 6 billion people living in major urban areas.[3] Given this radical transformation, the city today can no longer be seen as an isolated element; as the philosopher Massimo Cacciari argues, *"there is no city, really, but cities only"*.[4] The new dimension of this network of spaces and its ability to involve such a large pool of people makes cities, as a system, a place on a global scale, able to redefine and condition the spatial and climate characteristics of the entire planet.

If we consider the city from this point of view, that is as one of the most important phenomena at the global level of this century, it is evident that there must be a correlation with climate change, the only other phenomenon capable of having such an influence on the planet. This relationship may not appear to be a foregone conclusion; in fact climate change arguments often tend to regard the natural territory, rather than the city, as a place in which experiment with ways of dealing with the environmental emergency, in a movement of rediscovery of a landscape environment remained in the background during

2. World Watch Institute, *State of the World 2007: Our Urban Future*, W. W. Norton & Company, 2007

3. UN (United Nations), *World Urbanization Prospects, the 2009 Revision: Highlights*, United Nations, 2010, p. 1

4. M. Cacciari, *Nomadi in Prigione*, in Aldo Bonomi, Alberto Abruzzese, *La città infinita*, Mondadori Bruno, 2004, p. 51 (own translation)





FIG. 1-2 Olafur Eliasson, *Ice watch*, Place du Panthéon, Paris, 2014

the last century. The reason is surely linked to the nature of the city and its negative influence on the balance of the planet. Just think, in this regard, that "urban activities", understood as the sum of all the actions that people carry out within a city, are responsible for more than 80% of carbon dioxide emissions, among the main causes of air pollution and the formation of the so-called "hole in the ozone", and which consume about 2/3 of the energy used globally.[5] Consequently it is possible to affirm that, if on the one hand mankind is responsible for the alterations in the environmental balance, on the other the city is the tool with which it has expressed his impact on the ecosystems.

Despite this, the city is also the place that most of all is affected by climate change and that highlights the main critical issues. By hosting a large part of the world's population, in fact, it is the place where the hardships of people manifest themselves. If we consider, then, the main effects of environmental factors, it is clear that they have a greater impact on cities because they, by their very nature, are particularly vulnerable. An example is the phenomenon of the heat island, which occurs in large urban centers where artificial surfaces absorb the heat of solar radiation and, releasing it slowly in the following hours, cause a sharp rise in surface temperatures. In particular, a difference of about 7°C was measured between the large urban areas and the rural context that surrounds

5. UNEP (United Nations Environment Programme)/ UN-HABITAT, *Climate Change: The Role of Cities: Involvement, Influence, Implementation*, UNEP/ United Nation, 2005, in A. While, M. Whitehead, *Cities, Urbanisation and Climate Change*, 2013, p. 1325



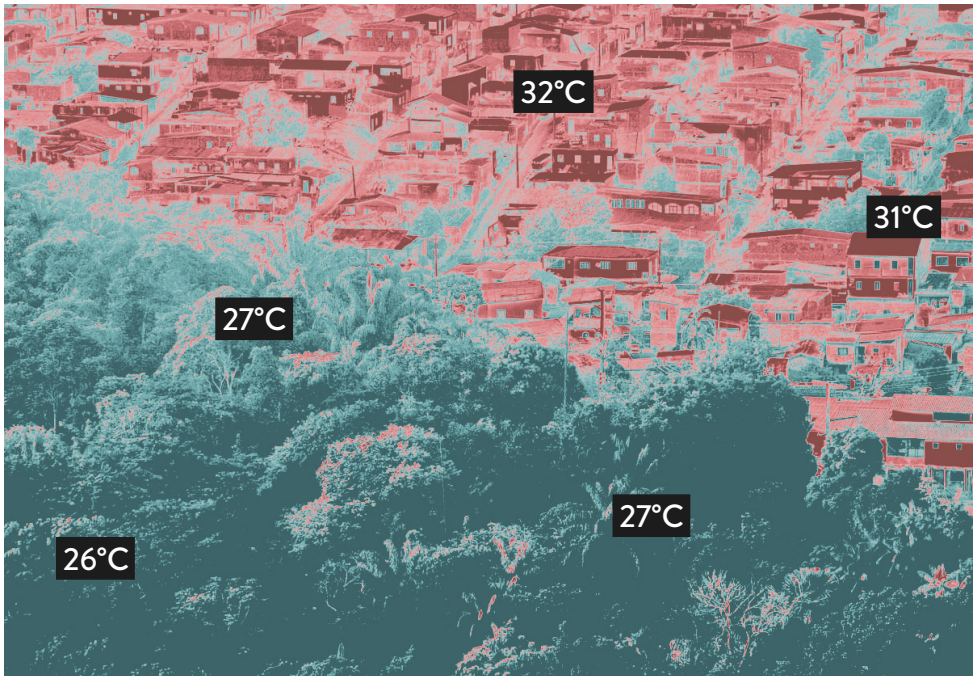


FIG. 3-4 The city of Manaus and the Amazon Reinforest. The personal rielaboration shows the hypotetic difference in temperature between a city and its surroundings.

them, indicating how much the city has the ability to create a microclimate different from the natural one.[6] Furthermore, the dependence on technological systems and infrastructure networks is a further critical level given that, in the event of destructive climate events, the city would not resist a prolonged shortage of such systems.

If therefore the city is the main culprit of climate change and also its greatest victim, it can only be part of the solution. As a place that more than any other encloses the potential to mitigate the effects of climate factors, the city is the place destined to become the *"center of our environmental future"*.[7] As previously seen, in fact, the city has the ability to generate microclimates also very different from that of its territorial context; this feature, which nowdays has negative implications in terms of climate discomfort, can be exploited to give life, instead, to project scenarios, aimed at creating spaces suitable to address the new environmental condition. This is certainly the greatest challenge of contemporary architecture: transforming cities into resilient spaces that are able to mitigate climate factors. After just over a century, therefore, it is preparing to undergo a second great revolution for the city, in which the focus is no longer urbanization, but the environment. As a result, the scale of values also changes: in the new *"climate change economy"*[8] the most important aspect is no longer the built or infrastructure development, but rather the climate-environmental conditions that the city will ensure its citizens.[9] Within this new scenario, the weight of the various architectural and urban elements is redefined. The fullness, which has always been the focus of the attention of designers, takes second place; the void, on the contrary, from a marginal element and often defined only as a negative of the built becomes central. It is in fact the open spaces, not the buildings, that have a greater impact from the environmental point of view, despite the current trends that see the efforts focus on the development of sustainable architectural bodies rather than sustainable cities. Strong of this conviction, this research work focuses on the possibilities of redefining the public space of cities. The latter, corresponding to that part of urban voids within which community activities are carried out and relationships between people are generated, is in fact the cornerstone of the climate revolution, through whose transformation it is possible to rethink at the same time the image of the city and the way to live its spaces, as well as make it more suitable to face the environmental emergency.

6. R. L. Wilby, *Past and projected trends in London's urban heat island*, in E. Graham, S.Lee, (edited by) *Weather, vol. 58*, 2003, pp. 251–260, cit. in AA.VV., *Climate change and the city: Building capacity for urban adaptation*, Elsevier, 2014, pp. 3-5, 31

7. S. Sassen, G. Mainguy, *Cities are at the center of our environmental future*, Sapiens, 2009

8. Colegio de Madrid, *Economistas N. 127 - Economía del Cambio Climatico*, Raíz Técnicas Gráficas, Madrid, 2011

9. Nicola Russi, *Agenti Climatici*, Project report, 2019

GREEN URBANIZATION

In 1841 a competition was held for the project to enlarge the city of Barcelona. The winning project, by Ildefonso Cerdà, redesigns, since 1859, the urban space of the city, through the definition of a standard element, a square block with beveled sides of edge 113 meters, and its repetition that gives life to a precise geometry. Recognizing in the grouping of 25 blocks a quarter, 4 quarters a district and 4 districts a section, then, Cerdà defines a strict hierarchy in order to uniformly distribute the main services. For each district there are a school, a church and a barrack; each district is served by a market; for each sector, finally, two public parks, an hospital and some administrative and industrial buildings are designed. This new way of designing the urban environment contrasts with the classic method of conceiving cities. It is no longer the historical context the base on which new projects born, but rather the *tabula rasa*, understood as the total absence of pre-existing significant elements.The heterogeneous

development, concentrated around places of urban, infrastructural or naturalistic interest, is replaced by an omnidirectional and potentially infinite expansion, independent of specific polarities. Finally, the architectural and stylistic mix gives way to the succession of architectures similar to each other and therefore devoid of identity characters of the places. This method of designing the city differs so radically from previous urban theories that a new definition is necessary; this is why a few years later, in 1856, Cerdà theorizes in the volume entitled *"Cerda: The Five Bases of the General Theory of Urbanization"*[1] the concept of urbanization.

In his book *"The possibility of an absolute architecture"*[2], Pier Vittorio Aureli deepens this concept comparing, first of all, its connotations with those of the Greek *polis* and the Roman *civitas*, the two main forms of organization of the inhabited nucleus in the classical period from which derive the morphologies of the contemporary cities. The first is a form of settlement that is based on the idea of *politics*, namely the public interest and relationships between people. The city conceived as a *polis* is therefore generated from a series of places that, each with different characteristics and well defined according to the use they will host for the community, support these activities and give a strong identity. The city conceived as *civitas*, on the other hand, is built from the concept of

1. A. Soria y Puig, I. Cerdá, *Cerdá: the five bases of the general theory of urbanization*, Electa, 1999

2. P. V. Aureli, *The possibility of an absolute architecture*, MIT Press, 2011, pp. 2-8

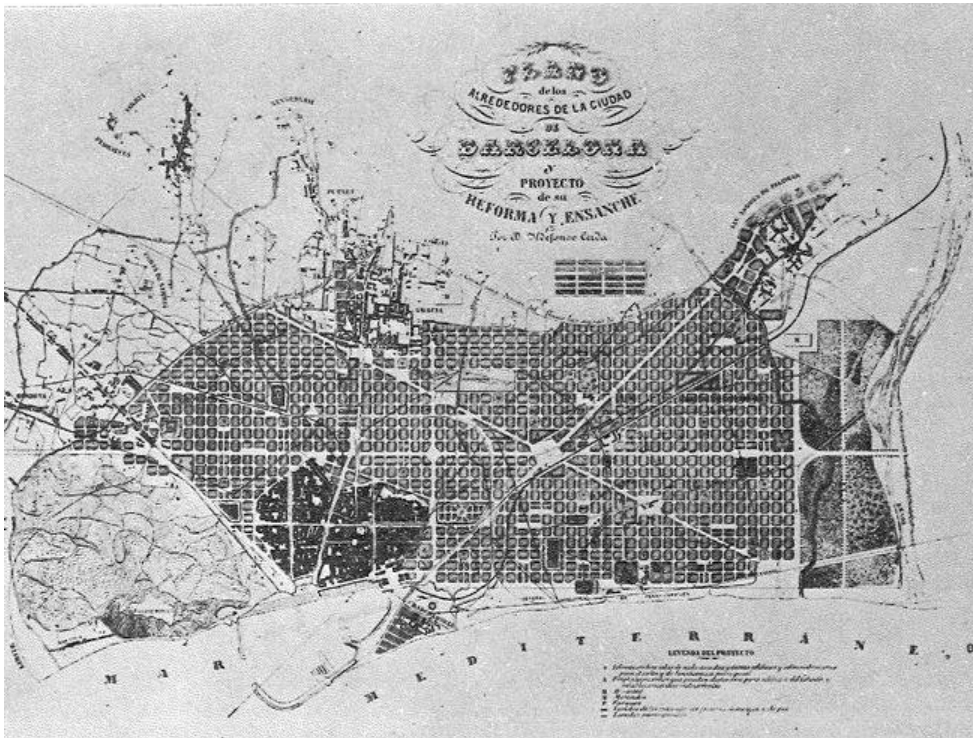


FIG. 1 Ildefonso Cerdá, *Proyecto de ensanche de la ciudad y su puerto*, Barcelona. The plan is one of the most interesting examples of urbanization.

economy. In the Roman settlement the focus is not on the people, instead it is concentrated on the well-being of the entire city and, more generally, of the empire. In this perspective, the goal to be pursued is expansion, seen as a generator of profit and power, which brings with it the definition of space by infinite repetition of the same prototype. As is easily guessed, the contemporary concept of urbanization lays its foundations in the theory of Roman *civitas*. However nowdays these places, built mostly in the post-war period and then in a time of expansion of the major cities, often coincide with the suburbs, so much so that we can say that the latter are the contemporary materialization of the concept of *urbs*. Given the poor quality currently found in most of these places, which usually do not work as imagined in the project phase and have had as a result to remain cut off from the socio-cultural context of cities, it is so clear that urbanization today, if applied as a method without a deep study of the relations that the buildings have with the city and the complexity seen in Cerdà's work, may generate some low-quality urban geographies featured by the genericity of architecture.

To date, on the other hand, we are witnessing a new trend in the design of cities, which focuses not on the urban expansion but on green policies and the naturalization of those urban spaces previously formed by vast areas made of concrete. Although this type of approach is driven by noble intentions,





FIG. 2-3 Towers city in Hefei and *Liuzhou Forest City*. Both projects generates spaces that can not be considerer as a city, but rather a form of urbanization not linked with cultural and historical characters.

linked to concepts such as sustainability and environmental protection, it is necessary to analyze the way in which they actually redefine the spaces of cities. This is because often such projects for the urban environment, while constituting the opposite of the expansion of the grey urbanized area, share part of its effects on the way of living its spaces. Paradoxical as it may seem, in fact, the processes of naturalization of urban spaces and bioclimate design, if operated without special attention to the context in which they fit, its spatial, but also cultural characteristics and its specific needs may result in the creation of places without identity, risking compromising the specificity of the various places within cities. As the urbanization made by the only repetition of the same architectural objects, the naturalization made planting trees without strong criterias (or in general all the projects born from the only environmental considerations) not generate cities. This trend, which can be defined as "*environmental climate determinism*",[3] is currently extreme and therefore particularly evident. However, this way of defining the forms of cities and buildings from the only considerations of climate nature, with a technical and determinist approach, is not a novelty of this century. Already Bruno Taut, in the thirties of the twentieth century, describes in one of his books this phenomenon,[4] taking as an example the relationship between the traditional houses of the Spanish island of Ibiza and those equally typical Japanese and stating that their characters, similar though in different contexts, highlight the use of environmental characteristics as the only factor defining their forms.

If, therefore, making cities greener and more environmentally sustainable is a fundamental need, but at the same time an uncontrolled and indefinite naturalization as in the past processes of urbanization cannot be considered a virtuous solution, how is it possible to create high-quality projects to rethink the space of cities? Taking up the words of Aldo Rossi and Richard Rodgers, who have long investigated the theme of determinism in architecture, it is necessary to overcome determinist and functionalist culture, recreating a relationship between architecture and history but above all between architecture and subject.[5] The enhancement of the concept of subjectivity, linked to the perceptions that people have about a place and the imagination that is created as a result, can therefore be the key to mend the relationship between the urban project and the identity characteristics of cities, giving life to a new "climate aesthetic" but always linked to the context in which it fits.

3. V. Olgyay, *Progettare con il clima. Un approccio bioclimatico al regionalismo architettonico*, Franco Muzzio Editore, 2013, Preface

4. C. Lepratti, *Caratteri permanenti dell'architettura sostenibile*, Genova University Press, 2018, pp. 76-78

5. M. Bovati, B. Albrecht, G. W. Reinberg, *Il clima come fondamento del progetto*, Marinotti, 2017, p. 83-84

THE IBERIAN PENINSULA

The map of the average annual temperatures of the European continent shows a strong heterogeneity between the various countries, indicating the presence of different climate zones that follow one another within its vast territory. From north to south we meet cold continental climates and Mediterranean ones, up to reach sub-desert arid climates, even if present in relatively small portions of territory. In this regard, the map also has the ability to clearly identify these areas of greatest concern, in which the overheating is already having significant effects on the environment and on the people who live there. The rise in temperatures, in fact, has direct consequences on the environment as it generates, in addition to the heat islands, collateral climate factors such as the insufficiency of water resources, the less frequent but more torrential rains which cause destructive phenomena such as floodings, the desertification of entire areas and the loss of biodiversity due to the alteration of ecosystems.[1]

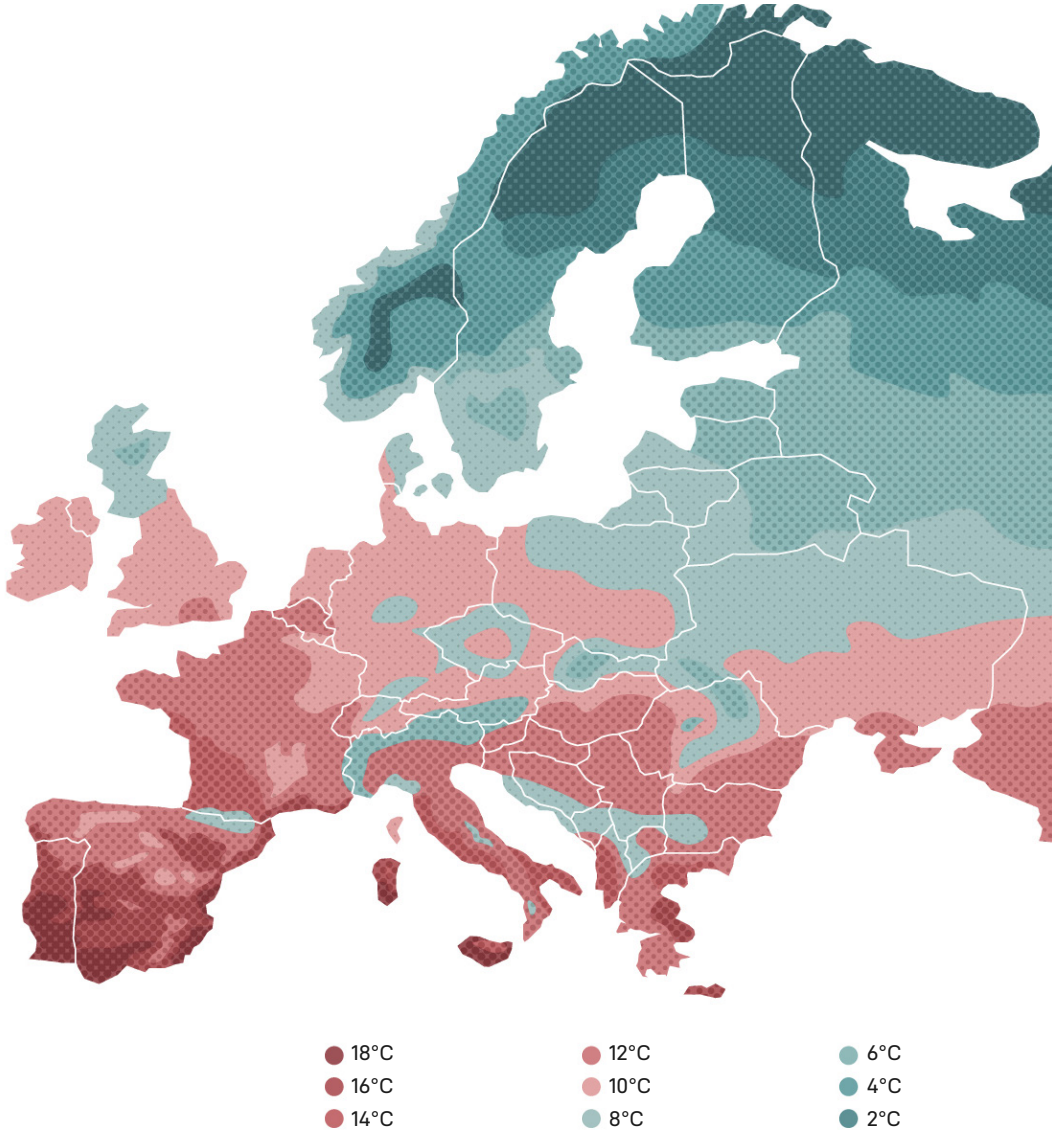
1. L. Ojea, *Imagenes y datos: asi nos afecta el cambio climatico*, Greenpeace, 2018

From this point of view, one of the most vulnerable areas within the European context is undoubtedly Spain. Because of its particular geographical position in the extreme south-west of Europe, the Iberian Peninsula has developed a climate which is different from that of all other European countries. The reason is linked, in addition to latitude and the consequent belonging to the warmer climate zones, to the influence of the currents coming from the Atlantic Ocean and especially from North Africa. As a result of these characteristics, today Spain records an increase in temperatures compared to the pre-industrial era of about 1,6°C[2], well half a degree higher than the global average (1,1°C) and beyond the 1,5°C limit established by the Paris Agreements. This increase in generalised temperatures basically results in increasingly warmer winters, a factor which covers the seasonal balance of flora and fauna, and with a growing number of extremely hot days during the summer months, which have a strong impact on people's health. An exceptional heat wave like the one that occurred in August of 2003[3], with temperatures up to 15°C higher than usual and tens of thousands of victims due to climate conditions, is therefore destined to become normal and to repeat itself several times in the next decades inside the Iberian Peninsula. On the other hand, Spain is also bound to suffer from a whole series of effects which, although not directly related to the rise in temperatures, are extremely linked and influenced by them.

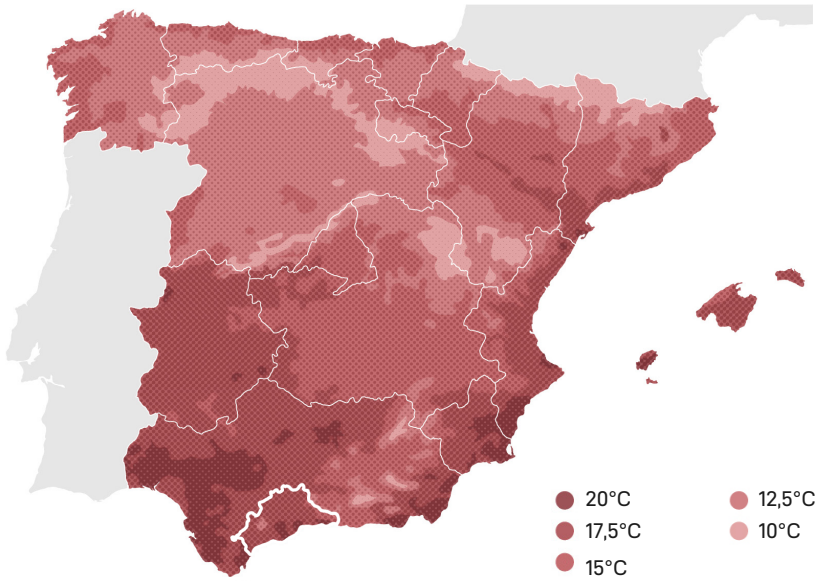
2. *Informe sobre el estado del clima de España 2020*, AEMET, Madrid, 2021

3. *La ola de calor más terrible tuvo lugar en 2003*, in *www.elconfidencial.com*, 2019

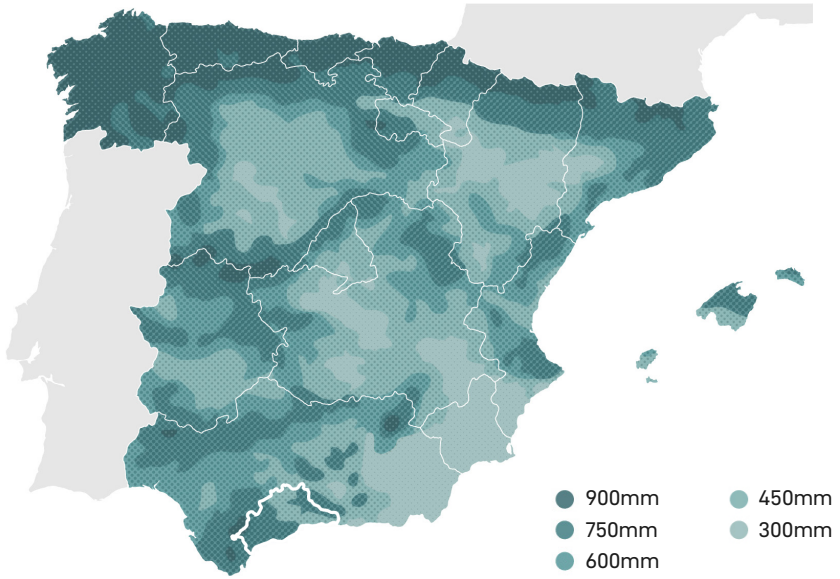
AVERAGE EUROPEAN ANNUAL TEMPERATURE



AVERAGE SPANISH
ANNUAL TEMPERATURE



AVERAGE SPANISH
ANNUAL PRECIPITATION



INTRODUCTION

Since the effects of climate agents, due to this rise in temperatures, are already particularly evident in the Iberian context today, unlike in most of the neighbouring territories, Spain unfortunately constitute one of the most interesting study cases in the European context, a testing ground for research on the subject and, subsequently, for design trials. By setting aside the forecasts and estimates, together with the related long-term action plans, which often take on too general a tone to be able to be translated into genuinely applicable strategies, it is possible to investigate the climate problems linked to the Spanish context and, subsequently, define concrete design scenarios in a specific location.

FROM LANDSCAPE TO DESERT

If we do not consider the rise in the level of the oceans, which occurs at a rate of about 5 millimeters per year and is estimated to reach about 2,5 meters by the end of the century, with serious consequences for the more than 10.000 kilometers of Spanish coast, climate change in the Iberian Peninsula has the desertification of large parts of the territory as its main consequence. In figures, 25% of the Spanish area already suffers from long periods of drought and desertification of the soil while the remaining 75% is at high risk considering the current trends of global warming.[1] In order to better understand this phenomenon, defined as a process of soil degradation with loss of fertility and consequent destruction of ecosystems, it is necessary to make a difference between the so-called *inherited* and *current* desertification.[2] The first is a condition intrinsically linked to the climate nature of the Iberian Peninsula. Developed over millennia, since well before the appearance of humans on

1. *Desertificación*, in *www.reforesta.es*, 2020

the planet, this process of desertification is a natural consequence of the geographical and morphological characteristics of the territory. As such, it took place slowly and gradually and is therefore not reversible, as it gave rise to a climate balance that has always characterized the Iberian Peninsula. The unique morphology of its landscape, different from that of all other European countries, is a direct consequence. The second, on the contrary, is caused by the anthropic action of the last century and which provoked the aggravation of the natural tendency of aridification of the soils, in addition to widening the area affected by this phenomenon. Given its recent development, this is still partially reversible, but only if climate change policies manage in the near future to slow down the rapid rise in temperatures and to curb unsustainable practices, including deforestation. Other climate factors which, although less so, affect the Spanish territory are floods, mainly concentrated in the southern area of the Iberian Peninsula and at the mouth of the Ebro River, loss of biodiversity and, above all, increasing difficulties in the supply of water resources. The impact of these phenomena on a context which, as we have seen, is already vulnerable by its nature and characterized by an unstable balance is so compelling that it raises many issues, partly visible today, which affect not only the landscape, but also the social, economic and healthcare field.[3]

2. J. M. Moreira Madueño, M. Rodríguez Surián, *Escenarios climáticos y desertificación en Andalucía,* Dirección General de Planificación e Información Ambiental de la Consejería de Medio Ambiente de la Junta de Andalucia, 2008, pp.16-18

3. Ministerio de Medio Ambiente, *A Preliminary General Assessment of the Impacts in Spain Due to the Effects of Climate Change*, Universidad de Castilla-La Mancha, 2005


MÀLAGA IS THE ANDALUSIAN
PROVINCE WITH THE HIGHER RISK
OF DESERTIFICATION (42% OF ITS
TERRITORY). NOWDAYS, ITS LANDSCAPE
IS ALREADY PARTIALLY ARID

AN EMPTY HINTERLAND

If we analyse the effects of climate change on a territory, we should consider, in addition to the direct effects, which are easily attributable to this phenomenon and have been discussed in depth in the previous chapter, the indirect ones. These, which can be defined as "side effects" because they depend on the direct ones and are caused by them, affect not only the landscape, but also fields such as economy, healthcare and social policies. The radical change in the morphology of a territory and the environmental conditions that characterize it due to the direct effects such as desertification, on the other hand, can only significantly affect the various aspects of society, which are intrinsically linked. The manifestation of these effects of climate change, unlike for direct ones, does not take place through a transformation of the territorial or urban context, but with a redefinition of the ways of living within them and the organization of such relationships between people. The

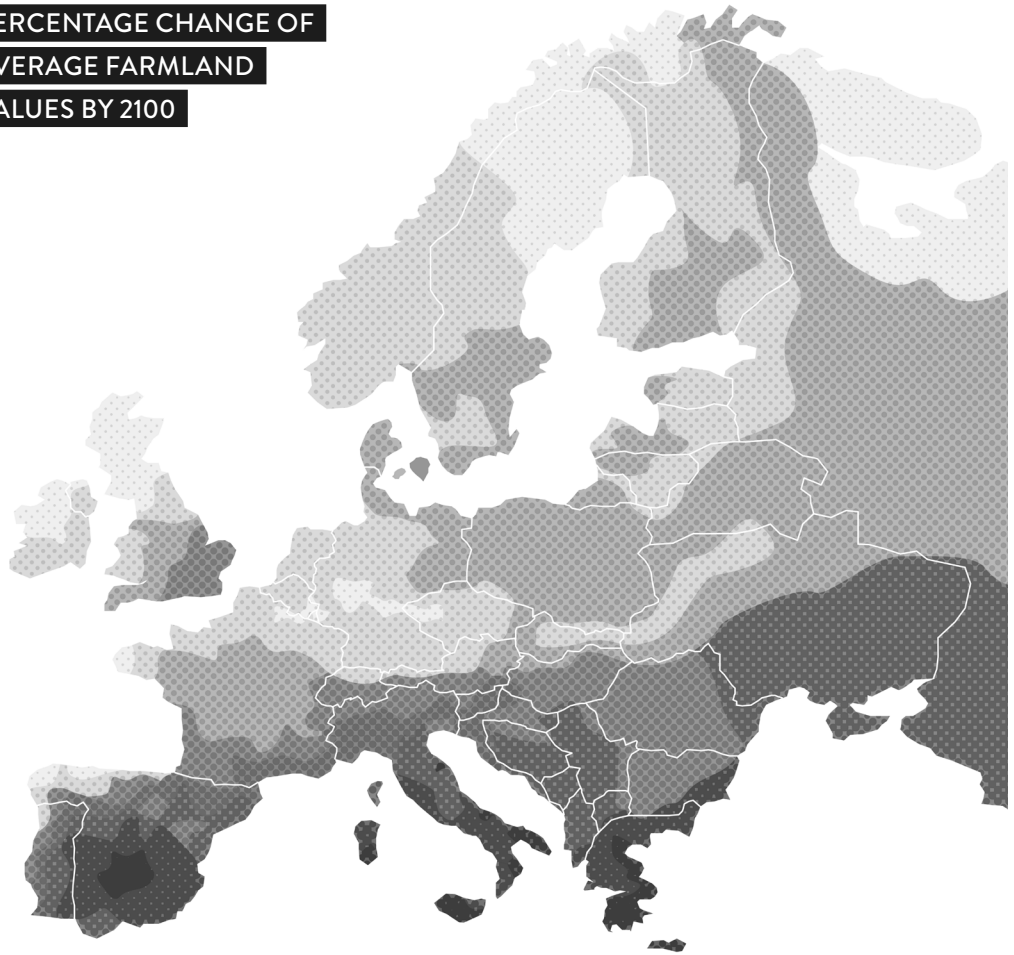
whole structure of contemporary societies, as well as more generally the political balances between the various countries, is therefore bound to change in the near future, in order to adapt to this new condition and to the new socio-economic needs linked to these environmental factors. An emblematic example of how these indirect effects can redefine some aspects of social structures is the shift in temperature. The graph of the projected annual temperature southward shift for the period 2070–2100[1] shows a huge change in the expected trend for the main European capitals, which in the period between 2070 and 2100 will have been affected by a rise in temperatures and subsequently have become similar to those of countries that today are several kilometers further south (Madrid, for example, will experiment, according to this theory, temperatures that nowdays are typical of the Northern Morocco). With this in mind, the countries which are cold and arid today, such as the Scandinavian countries, are destined to develop an increasingly mild climate and to witness a process of soil enrichment, with relative financial advantages. On the contrary, the countries which today are characterised by a mild or warm climate will be affected by a series of economic consequences, such as the agricultural and tourism crisis due to a territory no longer conducive to its prosperity, as well as a social crisis found in the decrease of employment opportunities and sanitary issues.

1. AA.VV., *Ensuring quality of life in Europe's cities and towns - EEA Report N. 5*, EEA, Copenhagen, 2009, pp. 67-68

By taking soil fertility and, more generally, the agricultural sector as a measure of this shift in socio-economic balances, it is possible to identify the areas most affected by this phenomenon at European level. In the map of *"Rich farmers and poor farmers"*[2], made for this end, it can be noted that the Iberian Peninsula is one of the places most affected by this climate shift.

2. K. Mathiesen, K. Oroschakoff, G. Co, A. Busquets Guàrdia, *Droughts, fires and floods: How climate change will impact Europe*, in *www.politico.eu*, 2021

PERCENTAGE CHANGE OF AVERAGE FARMLAND VALUES BY 2100



The Spanish context therefore, partly because of the political, social and economic issues that have characterized the Iberian Peninsula since well before the appearance of climate agents, is an index of this relationship between climate factors and the various areas of life within contemporary society.

From the economic point of view, in fact, Spain has been a rural country for several centuries, mainly linked to agricultural activity. Even today it is one of the most productive countries in Europe and beyond, concentrating within its territory (and especially in the southern region of Andalucia) a third of the world's olive cultivation and establishing itself as the country with the highest number of vineyards in the world with the 13% of all the land used globally for wine production.[3] However, from the fifties of the last century, the industrial development and the birth of the seaside tourism economy marked the beginning of a crisis in the sector that still afflicts the country today. This decline in the agricultural sector has also been linked to the loss of vast portions of fertile soil, due to the partial desertification and loss of biodiversity in the territory. In addition, the progressive decline in available water resources has made it increasingly difficult for this activity to be carried out, especially in a climate where high temperatures do not allow the growth of numerous crops, except through a wide consumption of water.

3. *Spain, the country with the most vineyards in the world*, in *www.spain.info.com*, 2021

Similarly, although with less serious consequences, the other economic sectors, industrial and tourism, have suffered a setback due to the appearance of new climate agents. The first because the awareness developed recently regarding the non sustainability of most industrial complexes has pushed to shift the attention towards the tertiary sector. The latter, however, because it has suffered from the deterioration of environmental conditions, losing part of the appeal resulting from climate comfort.



FIG. 1 Marcel Nino Pajot, *Hombres de la Mancha*. The painting represent the *Quixote*'s landscape as a continous and arid desert.

On the other hand, if we look at the relationship between the social sphere and climate agents, it is easy to see that the question of the emptying of the hinterland is the most important one, given its extent in terms of the parts of the territory concerned and the number of people involved. To date, in fact, the surface definable *vacia* (empty) corresponds to 53% of the total. Since, because of this phenomenon, only 15.8% of the population lives in this area, the remaining 84.2% is concentrated in areas near the coast and in large cities (corresponding to 47% of the Spanish territory).[4] Not surprisingly, within the emptied territory of the hinterland there are only two cities, in addition to Madrid, that exceed 250 thousand inhabitants. The reasons why this demographic disparity has been generated in the last century are the same that have led to the concentration of the majority of the population globally within the large urban centers: the lack of availability of services, infrastructure and employment opportunities in extra-urban areas. Unlike other countries, such as neighbouring France, however, Spain has seen much greater emptying. This is because the Spanish hinterland, by its very nature, was already characterized by the presence of large desolate and uninhabited areas and, on the other hand, Spain was among the least densely populated countries at European level even before the flight from the countryside began. The legendary *Don Quixote*,[5] protagonist of one of the most famous Spanish novels, offers us, through

4. S. Del Molino, *La España vacía*, Turner Publicaciones, Madrid, 2016, pp. 25

5. M. Panadero Moya, *El espacio geográfico del Quijote*, in *Estudios Geográficos n. 256*, 2004, pp.482-485

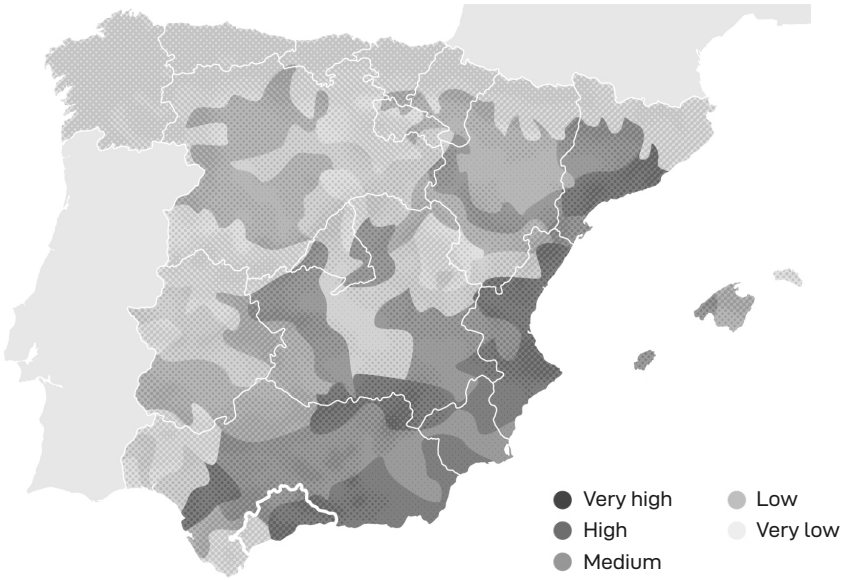
the tales of his knightly quest, a perspective of these geographies and landscapes of the Iberian hinterland, describing it as a monotonous and arid plain and making a sort of "historical photograph" of that time.

Like the crisis in the agricultural sector, the phenomenon of the *Espana Vacia* began before the onset of climate change and for this reason it is particularly affected to date. Despite being a phenomenon that constantly affects the Spanish territory, in fact, the exodus from the countryside began in the post-war period, precisely between the fifties and the seventies, in a period called *Great Trauma* as most of the migratory movements have been concentrated in this twenty years.[6] To date, however, current climate trends and the consequent spread of desertified territories are destined to intensify these migratory flows that since 2008 have been responsible for the disappearance of 25 small rural countries, with thousands of people who have abandoned them to go to big cities among Spain and other countries.[7] No longer by choice, linked to the search for more opportunities, but by necessity, given the impossibility of living in such extreme climate conditions, more and more inhabitants of the hinterland will be forced to move in search of more favorable environmental conditions. As a result, political migrants, who today are moving to escape from wars and hostile places in general, will be added to a new

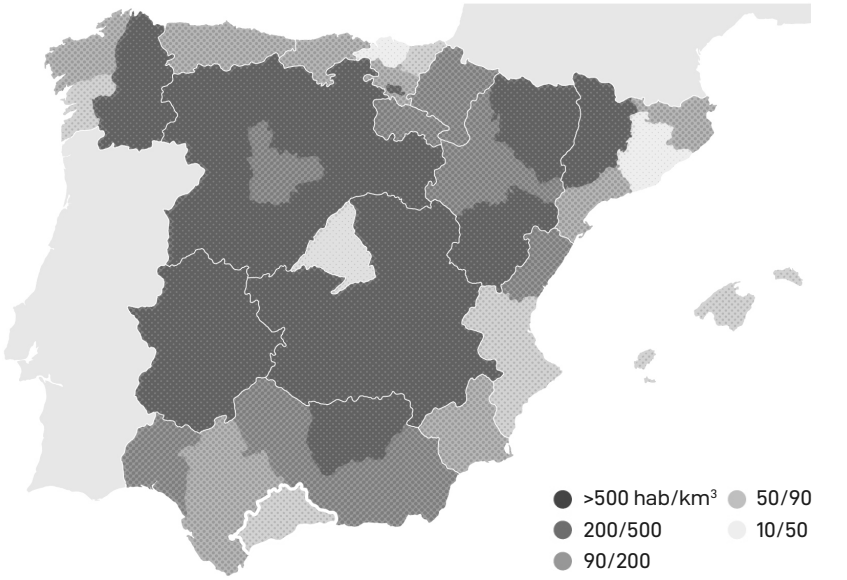
6. S. Del Molino, *La España vacía*, Turner Publicaciones, Madrid, 2016, pp. 36-55

7. *Los problemas de la España vaciada*, in *www.greenpeace.it*, 2021

DESERTIFICATION RISK IN SPAIN



POPULATION DENSITY IN SPAIN



category: that of climate migrants. As it is easy to imagine, among these migrants the most affected will be those belonging to the economically weaker groups that, in all probability, will not find favorable conditions for the insertion within new cities and new communities. For this reason, in order to avoid that *"climate apartheid"*[8] which has already found its place in the wake of disastrous climate events in the last few years in countries in economic difficulty, it is necessary to imagine, even today, projects to accommodate these new flows of people within large cities with a view to inclusion within the community.

Within the Spanish landscape, Málaga is among the top ten cities that have experienced an increase in population in recent decades,[9] even more than Madrid in proportion to the number of inhabitants, defining itself as one of the most important destinations, especially with regard to the southern territories of the Iberian Peninsula, of the migratory flows due to the phenomenon of the emptying of the hinterland. Imagining scenarios which rethink its urban space, therefore, we must keep in mind the possibility that climate change intensifies these flows of people and imagine, consequently, spaces able to welcome them and promote their integration into the society.

8. A. Dawson, *Extreme Cities: The Peril and Promise of Urban Life in the Age of Climate Change*, Verso, 2017, pp. 227-231

9. *Málaga - Población: inmigrantes, emigrantes y otros datos sobre los habitantes de cada municipio*, in *www.epdata.es*, 2021

FIG. 2 Justin Brice Guariglia, *Climate Signal*. The installation aim to sensibilize on the climate migrants' theme.



CREDITS

pp. 6-7 / Málaga seen from the top of the Limonero Dam, with the Guadalmedina River in the foreground, 2021. Photo: personal

p. 12 / Olafur Eliasson, *The weather project*, Tate Modern, London, 2003. Photo: Olafur Eliasson

pp. 18-19 / Ed Hawkins, *Warming stripes*, University of Reading, 2020. The chart intuitively shows the rise in temperatures from 1850 to the present.

p. 21 / Patricia Corcoran, Kelly Jazvac, *Plastiglomerate samples*, 2013. The series of plastiglomerates, collected in Kamilo Beach, Hawaii, can be assumed as the evolution of rocks conglomerations and represent the materialization of the *Anthropocene Era*. Photo: Kelly Wood.

p. 24 / Climate glossario: resilience, mitigation, adaptation. Source: Alisdair McGregor, Fiona Cousins, Stephen Cole Roberts, *Two degrees: the built environment and our changing climate*, Routledge, 2012, pp. 49-53

pp. 26-27 / Frame taken from the first scene of the film *Mad Max: Fury Road*, 2015, directed by George Miller. The recreated setting represents the contemporary imagery of the *"Dry Apocalypse"*, within a world complitely desertified and in which it is difficult to survive.

p. 30 / Olafur Eliasson, *Ice watch*, Place du Panthéon, Paris, 2014. Photos: Martin Argyroglo

pp. 32-33 / The city of Manaus and the Amazon Reinforest, 2019. The personal rielaboration shows the hypotetic difference in temperature between a city and its surroundings. Photo: Reuters (original and personal rielaboration).

p. 38 / Ildefonso Cerdá, *Proyecto de ensanche de la ciudad y su puerto*, Barcelona. The plan is one of the most interesting examples of urbanization. Source: Arturo Soria y Puig, Ildefonso Cerdá, *Cerdá: the five bases of the general theory of urbanization*, Electa, Madrid, 1999.

pp. 40-41 / Towers city in Hefei, China (on the left). Photo: Jianan Yu/Reuters. *Liuzhou Forest City*, Stefano Boeri Architetti, China (on the right). Photo: Stefano Boeri Architetti. Both projects generates spaces that can not be considerer as a city, but rather a form of urbanization not linked with cultural and historical characters.

p. 47 / *Map of the average annual surface temperature in the European context*. The map put in evidence the most critical areas in relation to the global warming. Source: EEA, European Environment Agency (personal rielaboration).

p. 48 (top) / *Map of the average annual surface temperature in Spain*. Source: Atlas climático ibérico, AEMET (personal rielaboration).

p. 48 (bottom) / *Map of the average annual precipitacion in Spain*. Source: Atlas climático ibérico, AEMET (personal rielaboration).

pp. 52-53 / Màlaga's landscape already partially arid and desertified. Photo: personal

p. 56 / *Percentage change of average farmland values by 2100 by region of the EU and the UK as a result of climate change, assuming a 3-degree uniform warming*, 2021. Source: *www.politico.eu* (personal rielaboration).

p. 58 / Marcel Nino Pajot, *Hombres de la Mancha*, XX century. The painting represent the *Quixote*'s landscape as a continous and arid desert.

p. 61 (top) / *Map of the desertification risk in Spain*. Source: IGN, Instituto Geografico Nacional (personal rielaboration).

p. 61 (bottom) / *Map of the population density in Spain*, 2018. Source: INE, Instituto Nacional de Estadística (personal rielaboration).

p. 63 / Justin Brice Guariglia, *Climate Signal*, Castle Williams, New York, 2018. The installation aim to sensibilize on the climate migrants' theme. Photo: Lisa Goulet.

02

A CITY TOWARDS THE OUTSIDE

COSTA DEL SOL'S MYTH

Costa del Sol is a territory located in the Spanish region of Andalucia, in the southern part of the country, between the cities of Tarifa and Cabo de Gata. If observed from a morphological point of view, it presents itself as a long sequence of small and large inhabited centers, of which Málaga constitutes the physical and symbolic center, that, over time, have developed following the same natural element: the coastline overlooking the Mediterranean Sea. Nevertheless, given the great density that characterizes this portion of Spanish territory, in contrast with the hinterland areas described in the previous chapters, this series of coastal cities appears more like a single large urban agglomeration, developed longitudinally in contact with the sea following its organic morphology. Seen in relation to the *N-340*, the long waterfront highway that crosses the Costa del Sol, this agglomeration can in fact be interpreted as a single, long linear city. Consequently, the real border is not the political one, which divides one city from another, but the one that separates the coastal areas from the corresponding inland

ones. The reason for this trend of development close to the Mediterranean Sea is linked to the economic revolution which, as mentioned in the previous chapter, has led to a rapid and important exploitation of the seaside tourism sector within the Iberian Peninsula. This transformation, which finds in the Andalusian coasts a particularly fertile soil given the particularly favourable climate and landscape conditions, has been able to redefine these territories, leading to an expansion of small fishing villages, soon becoming tourist centres, as well as creating a new common architectural language, characterized by the search for exaggeration and amazement of the visitors. This, called *"Estilo del relax"*[1], is the materialization of the new holiday culture and has given rise to architectures that are still emblematic of the so-called *Costa del Sol's myth*.

1. J. A. Ramírez, *El estilo del relax : N-340, Málaga, h. 1953-1965*, Servicio de Publicaciones del Colegio Oficial de Arquitectos, Málaga, 1987, pp. 11-15



FIG. 1-6 Tourist posters of the second half of the 19th century. These images best represent the myth of the Costa del Sol and the link with the most important tourism infrastructure: the airport.

BORDERS AT THE CENTER

This inversion in the scale of values that has brought the borders of the Spanish territory, i.e the coastal area, to the center of the dynamics of the country, while before it had little to no importance, took place since the fifties of the last century and lays its foundations in a radical economic revolution. In those years Spain based its economy on agriculture, which affected much of the Iberian territory, trade and, although with a development of the sector significantly lower than the other major European countries, industrial production. For this reason, and in the wake of the country's monarchical past that led to a centralization of power and economic interests around the capital, the hinterland of the Iberian Peninsula was the beating heart of the nation, while, on the contrary, coastal areas were relegated to residual spaces and not too much involved in the development processes of the country. However, following the agricultural crisis, due to the impoverishment of vast portions

of territory in the central-southern area of the country, and trade, due to the autarchic policies of Francisco Franco that made Spain isolated compared to other European countries, at a particularly critical time due to the recent end of the civil war, a redefinition of the hierarchies of the economic system was necessary, with a consequent shift of attention from the center to the edges of the Iberian Peninsula. Franco himself, who remained at the head of the country with his dictatorial regime from 1939 until his death in 1975, became aware of the gravity of the situation and started the economic revolution, opening up to the rest of the world. In particular, the contribution of the United States, which were



FIG. 1 Lina Lapelyte, Vaiva Grainyte, Rugile Barzdziukaite, *Sun & Sea (Marina)*, Lithuanian pavillion at the Venice *Biennale*.





FIG. 2-3 Tall buildings close to the seaside in Málaga's most important beach, the *Malagueta*.

interested in establishing military bases in the Iberian Peninsula in order to fight the Russians in the Cold War, financed economic development policies in 1959, promoting the interaction of Spain with other states.[1] The consequent benefits of this renewed link with the European context, however, not only affected the commercial sector, but also tourism, which was born in those years but was destined to become increasingly important over time. As for goods, in fact, the possibility opened up for people from other countries to cross the Spanish borders. Suddenly the Iberian Peninsula, a place that by its nature was particularly suitable for the holiday thanks to the warm climate and the multiple views of the Mediterranean Sea, became one of the most popular tourist destinations at European level. To better understand the scale of this economic revolution, it is sufficient to say that, to date, tourism in Spain is by far the most important sector, concentrating 15% of the PIB (Producto Interno Bruto)[2] of the whole country, three times more than the car industry or agriculture. On the other hand, it is enough to look at the large buildings present along the coastline of cities like Málaga to realize how much the tourism sector has become central in those areas and how it has influenced by the time the most diverse sectors, architecture on all.

1. S. García Bujalance, *El Plan General de Málaga de 1983: Un instrumento para la transformación urbana*, Universidad de Málaga, Málaga, 2015, pp. 36-43

2. C. Molina, *El turismo ya aporta al PIB español tres veces más que la automoción*, in *www.elpais.es*, 2019

THE LINEAR CITY

The term that identifies the cities that, like Málaga and the other inhabited nuclei of the Costa del Sol, have developed in the course of the time following the shape of a longitudinal axis, is that of linear city. This way of designing the urban space of cities was theorized and introduced for the first time by Arturo Soria y Mata in 1880, with his project for the *Ciudad Lineal* in Madrid. The city designed according to this principles is based on the criteria of maximum efficiency[1], a strategy based on the technical-practical advantages that can be obtained and that doesn't consider the formal aspects, which are just a consequence. The choice of the elongated morphology of the designed space, in fact, involves a number of benefits from the urban point of view, first of all the ease in organizing the mobility system (central theme at the turn of the 19th and 20th centuries, when transport was undoubtedly the most important issue). Furthermore, each portion of the city is well connected to the others in the linear city, eliminating the problem of isolated parts that were generated in the traditional

1. A. Soria y Mata, *La città lineare*, Il Saggiatore, 1968, p. 19

dichotomy center-periphery, and also served by the main systems of support to public life, which are evenly distributed along the main axis. Moreover, by defining a more or less fixed section, and usually not too large, it is possible to preserve the natural and agricultural territory from the expansion of the urbanized space that at the beginning of the 19th century appeared unstoppable. At the same time, regulating the section at a relatively small distance give life to cities in close contact with nature in all their parts, improving the quality of life within them and involving the non-integrated territories more in the dynamics of city life.[2]

2. This ability of the linear city to enhance the relationship between urban space and natural space, result of the naturalist vision of Arturo Soria y Mata, will then lay the foundations for the definition of concepts of Garden-city and diffuse city. Enrico Prandi, *L'architettura della città lineare*, Franco Angeli, 2017, p. 50

Of course, designing according to the principles developed by Soria also involved some critical issues, which arose when you passed from an ideal city to a real one, colliding with the relative problems of an empirical nature. The most important is the lack of specificity of the various portions of urban space. The city of Arturo Soria y Mata is in fact conceived with the intent of being a potentially infinite urban agglomeration that developed along an axis also of indefinite length;[3] as such, it is the result of a repetition of the same element, consisting of the infrastructural section and the architectural bodies that flanked it. This multiple repetition of the same architectural system generated urban geographies that did not differ from each other and did not define polarities or hierarchies able to enhance the

3. Marco Bovati, Sergio Crotti, *L'ambiente dell'architettura: alterità progettuale del paradigma ecologico*, Maggioli, Santarcangelo di Romagna 2010, p. 57

identity of the city. Following these principles, a city built in Japan would be no different from a city built in Spain, except for a matter of style of individual architectures.

Nevertheless, the theory developed by Arturo Soria y Mata had, in the following decades, an important influence on urban theory and on some illustrious designers, including Le Corbusier, who took these principles in some of their planning works. In this regard, it is quite interesting to see the way the theoretical principles developed by Soria have declined and, through various contaminations, have generated, over time, projects of unconventional spaces and quality. It is in fact in the influence it has had on the following urban theories, more than in its realized plans, that the true importance of the job of Soria resides. In addition to that, using linear city theory as a reading key, it is possible to understand the dynamics that led the Andalusian coastal cities to develop longitudinally. Although these were not designed around an infrastructure but along a natural axis, in fact, they can still be defined linear cities, as they developed, over time and unknowingly, many of the traits described by Soria.

THE SEASIDE TOTALLY COVERED BY THE TALL BUILDING OF THE MALAGUETA QUARTIER IN MÁLAGA, IN A VIEW FROM THE ALCAZABA CASTLE ON THE GIBRALFARO MOUNT



MÁLAGA AS AN ISLAND

The city of Málaga can be defined, from the urban point of view, as an island.[1] Within the panorama of Spanish cities, in fact, it is an exception, having developed over time spatial and cultural connotations different from those of other major urban centers, while sharing the political context. Nestled between the mountains to the north and the sea to the south, the city has always been characterized by geographical isolation from other Andalusian towns. This led, in the past, to a first great cultural and formal differentiation, also due to the longer duration of Arab rule. Málaga and Granada were in fact the last two cities to be recaptured by the Catholic kings, respectively in 1487 and 1492 (the *Reconquista* had begun about 500 years earlier), thanks to the topography of their territory that made them easier to defend.[2]

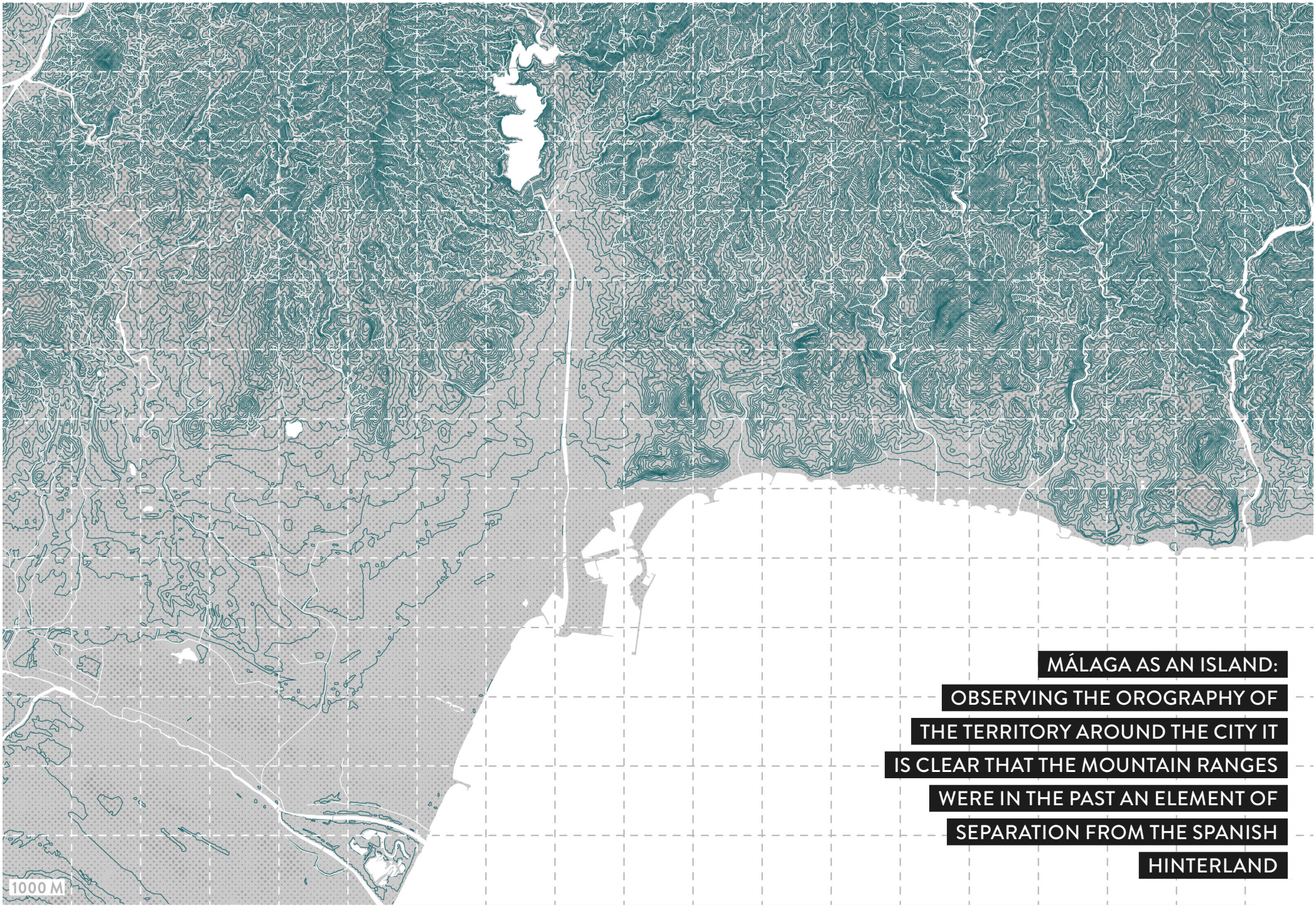
Just as the territorial characteristics of the Costa del Sol have meant that it developed by exploiting the new economic condition based on tourism

1. The information contained in the first part of this sub-chapter is the result of an interview with Susana García Bujalance, Professor of Urban Planning at the University of Málaga.

2. A. Rubio Díaz, *Málaga. de ciudad a metrópolis. Tomo I: Del lugar a la ciudad*, Asociación Provincial de Constructores y Promotores, 2003, pp. 147-153

in a greater way than other parts of the country, these historical and cultural connotations of Málaga's heritage allowed it to become, in the same years, the center of Andalusian seaside tourism. Given its open nature towards other countries, in fact, Málaga is already prepared to welcome new flows of people when, in the fifties, Franco decides to open borders, already having in those years the infrastructures suitable to manage the new tourist mobility, that is the port and the airport. The latter, built in 1919 to serve as a stopover on the long commercial routes from Toulouse to Casablanca, following the opening of the borders is in fact quickly converted and adapted to the new needs of public transport. The port, on the other hand, is even more important for the city of Málaga, as it was built with it in the Phoenician era. Also thanks to its presence, the city has developed a great openness towards cultures outside the Iberian Peninsula, so as to present itself, to date, as a real palimpsest of forms and styles also very different from each other.

Tracing the stages of this urban and infrastructural development of Málaga, the construction of these two large infrastructural poles, the port and the airport, is emblematic as they, symbols of openness to foreign countries, were built several years before the construction of the highways connecting with the Spanish hinterland.[3] This contradiction, i.e benefiting a link with the outside



MÁLAGA AS AN ISLAND:
OBSERVING THE OROGRAPHY OF
THE TERRITORY AROUND THE CITY IT
IS CLEAR THAT THE MOUNTAIN RANGES
WERE IN THE PAST AN ELEMENT OF
SEPARATION FROM THE SPANISH
HINTERLAND

rather than with the inside of the country, is nevertheless a decidedly contemporary theme, which is reflected in the current composition of the city and, above all, in its infrastructure. Following this trend, the Málaga's transport system has developed more in the southern area, close to the sea, so that, to date, the only two metro lines and the railway station are located in the south-west part of the city, between the port and the airport. Similarly, because of this isolation from within the country and the enhancement of systems that can connect the city with the rest of the world, the urban environment project in the last century has concentrated in areas along the coast.

On the contrary, the parts of cities in the hinterland have gradually become increasingly disconnected from the urban context, relegated to peripheral and forgotten areas. For this reason, today Málaga is divided: there are two cities that are profoundly different from each other, one towards the sea and one towards the hinterland. The developed city, the result of projects to expand the coastal urban space and its enhancement operated through the construction of services and infrastructure as well as valuable architectures, is in contrast with a city consisting mostly of large residential blocks, sometimes even dilapidated and lacking the necessary public support elements.

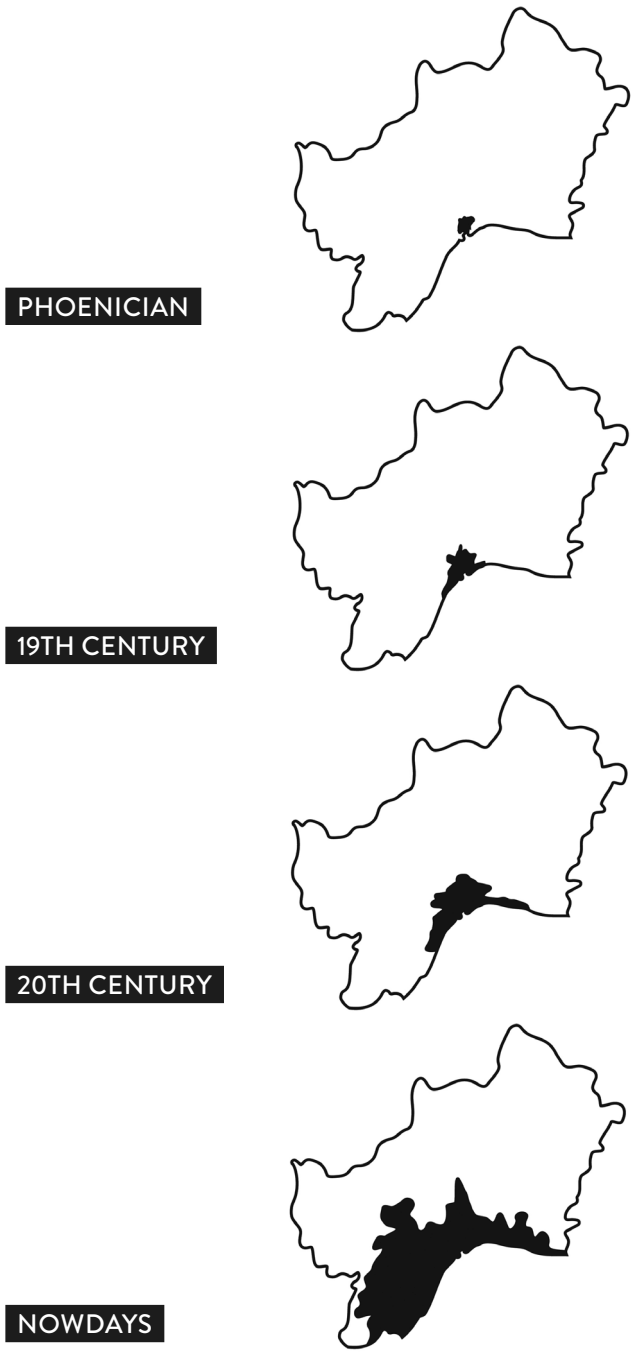


FIG. 1 The linear evolution of Málaga's urban space, from the phoenician period till today.



MÁLAGA FROM THE SEA



MÁLAGA FROM THE LAND

FIG. 2-3 Málaga seen by the sea: a well developed urban area, full of public facilities. Málaga seen by the hinterland: a suburban area with building similar to each other.

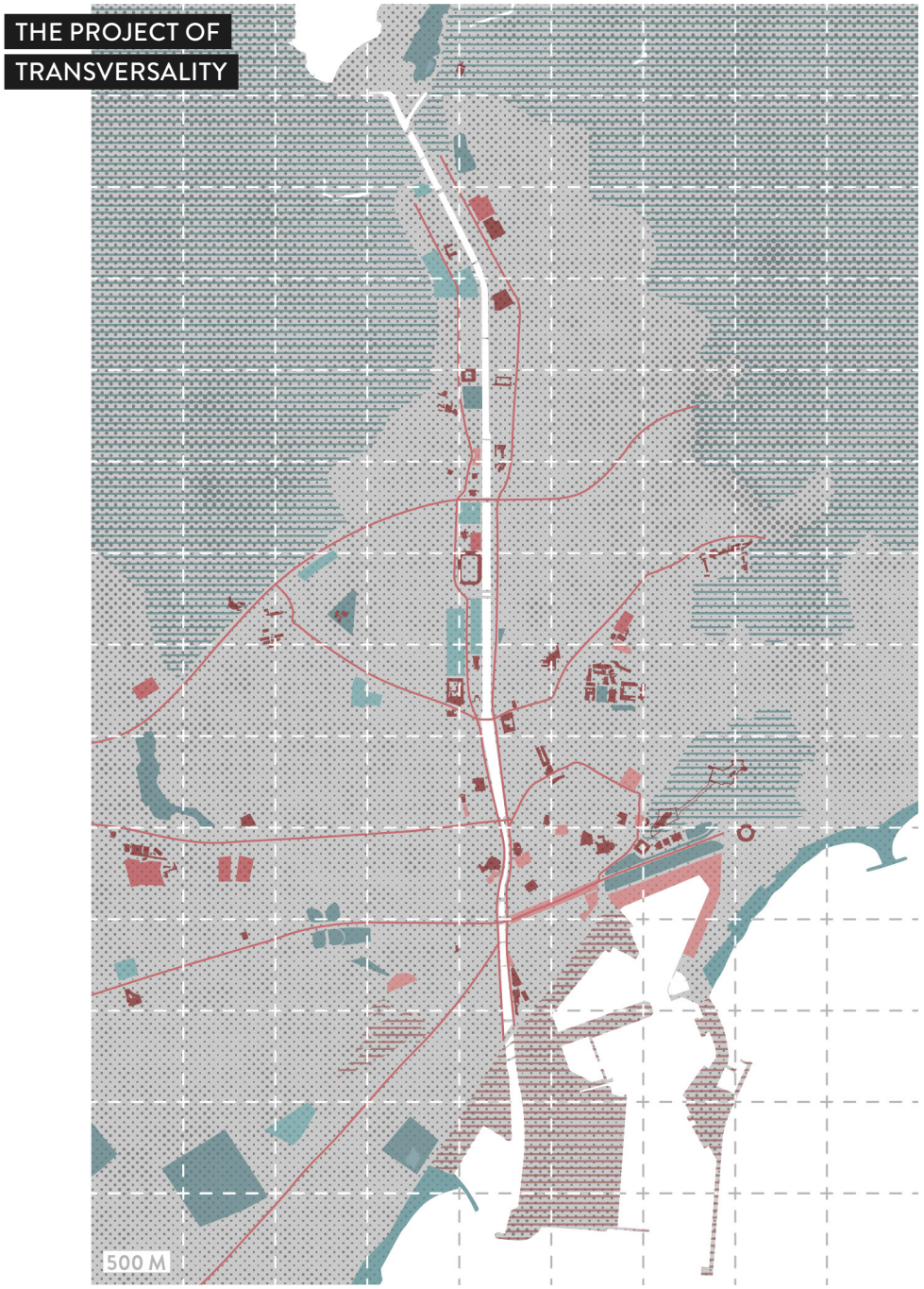
A CITY TOWARDS THE INSIDE

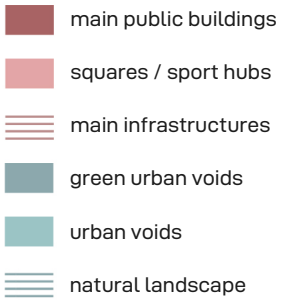
Taking a closer look at this part of the city, developed toward the inland, it is easy to understand how the condition of great criticality in which it is today corresponds to interesting design opportunities. In contrast to those along the coast, which are saturated due to the large presence of residential buildings and services related to tourism, and those of the historic center, characterized by a very dense urban fabric, the spaces developing in the northern part of the city have, in fact, a more porous urban fabric, rich in voids that are not well defined and so constitute a sequence of opportunities from the architectural point of view. In addition, these parts of urban space are characterized by a much closer link with the landscape and context of Málaga, which defines its northern edge, constituting an important possibility to rethink and valorize the relationship between the city and its surroundings and enjoying the presence of a natural countryside.

The will of the municipality to depart, in part, from the image of Málaga as a tourist city, only in relation to the holiday, opens up, then, to the possibility for these areas, which today lack a precise identity, to be defined starting from a new prevalent function, linked to culture. Already to date, in fact, there are many poles defined in non-central areas that are part of this network of spaces, including for example the two university citadels and some cultural centers. Given the need to go beyond the design of coastal areas, and also due to the qualities described above, it is therefore clear that the Málaga of the future must be defined by partially loosing itself from the direction that historically defined its forms and by enhancing the inner areas. But how is it possible, in practice, to start such a process of urban development? From which elements or theories of design?

Defined as the opposite of the longitudinal design, the idea of transversality is a possible solution. By redesigning urban space in a perpendicular way to the current forms of the city, in fact, it is possible to rethink the areas to the north while enhancing, at the same time, their link with those, now more developed, along the coast and in the historical center. The idea of linear design, which may seem to be the element to overcome with the occasion of this new urban scale project, can on the contrary be once again an effective method of defining space, simply shifting the focus from the longitudinal axis given by the coastline to another

that crosses the city in the opposite direction. Among the various transversal elements that can act as a generator axis for a new linear project of the city, the Guadalmedina River is undoubtedly the most important, as well as the most obvious if you look at any map of the city. In fact, it crosses the entire urban area of the city of Málaga, cutting it with a geometric precision from north to south and defining, thanks to its size and its strategical position, a clearly visible exeption compared to the rest of the urban fabric. Just as the *Alameda* is the axis of today's linear Málaga, following the shape of the limit between the city and the sea, so the Guadalmedina is destined to become the focus of the new process of redefining tomorrow's Málaga.





CREDITS

p. 71 / Tourist posters of the second half of the 19th century. These images best represent the myth of the Costa del Sol and the link with the most important tourism infrastructure: the airport. Sources: Iberia, Patronato Nacional del Turismo, unknown.

p. 73 / Lina Lapelyte, Vaiva Grainyte, Rugile Barzdziukaite, *Sun & Sea (Marina)*, Lithuanian pavillion at the Venice *Biennale*, 2019. Photo: Neon Realism

p. 74 / Tall buildings close to the seaside in Málaga's most important beach, the *Malagueta*. Photos: personal

pp. 80-81 / The seaside totally covered by the tall building of the Malagueta quartier, in a view from the Alcazaba Castle on the Gibralfaro Mount. Photo: personal

pp. 84-85 / *Málaga as an island*. Map of the orography of the territory around the city, which reveal the natural separation between Málaga and the cities in the Iberic hinterland. Source: personal drawing

p. 87 / The linear evolution of Málaga's urban space, from the phoenician period till today. Source: Instituto de Cartografía de Andalucía, *Atlas de la Historia del Territorio de Andalucía*, Málaga, 2009 (personal rielaboration)

p. 88 / Málaga seen by the sea: a well developed urban area, full of public facilities. Photo: alegri

p. 89 / Málaga seen by the hinterland: a suburban area with building similar to each other. Photo: Sebastian Wasek

p. 92 / The project of transversality: the Guadalmedina as a new axis for Málaga's development. Source: personal drawing

03

THE RIVER THAT ISN'T A RIVER

CHRONICLES OF AN URBAN FRACTURE

The Guadalmedina River is part of the twenty rivers that make up the so-called *Cuenca del Sur*. Although it does not stand out because of its size or length, it is an extremely important landscape element, since it is from its shores that the city of Málaga developed thousands of years ago. However, what really makes Guadalmedina interesting is its troubled history, linked to a long series of disasters which have led to numerous floodings of the adjacent urban space. To understand the scale of these phenomena, it is sufficient to compare the number with which these events occurred over time, as well as their intensity, with those of the other rivers of the *Cuenca del Sur*. It is evident, looking at the data, that the Guadalmedina is not only a catalyst of climate events, but one of the most important in the whole Andalusian territory. Of the twenty rivers that are part of its own basin, the Málaga's river stands as the third in number of events; the first two, moreover, are considerably longer. Linked to this type of climate events is also its current condition, that is, a state of almost perennial

dryness that characterizes it for more than three hundred days a year. Thanks to its characteristics, difficult to find in a landscape element such as a river, it can in fact be the element that is the basis of a possible development project of the northern areas of the city. The many critical aspects that characterize it, in fact, correspond to the same potential for a rethinking of the public space of the city that, following a thorough study of its characteristics, can be identified and exploited for the purpose of the project.

" In the cities fractures are continually opened, places deprived of functions and roles are multiplied, places that have lost their physiognomy due to the dissolution of the relationship between the physical aspect, the social character of the activities and the inhabitants, the history of the city. "

Bernardo Secchi, *Un problema urbano: l'occasione dei vuoti (il vuoto)*, in *Casabella n. 503*, 1984 (own translation)



THE RIVER OF THE CITY

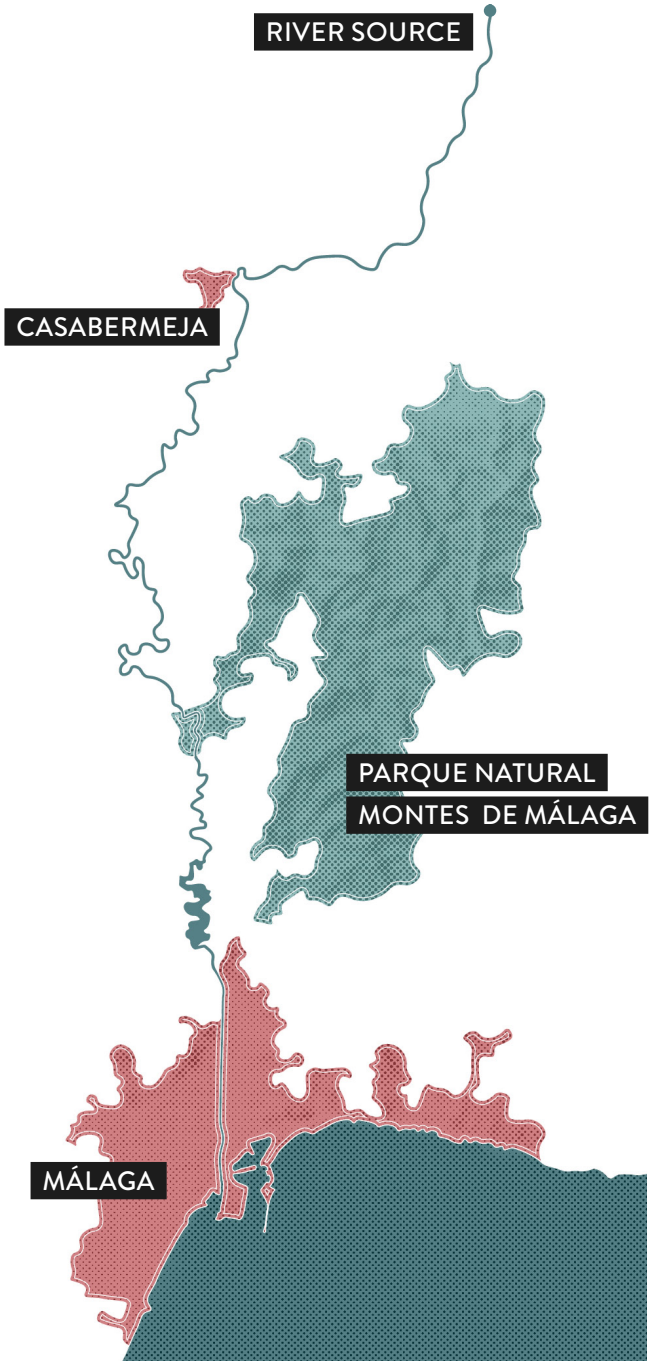
Since the dawn of time, every city has developed in the vicinity of a river which, bringing water useful to cultivate, to drink and to wash, constituted the generating element and that was at the base of its development. In the case of Málaga, the river in question is the Guadalmedina, by far the most important as well as the most linked to its historical and cultural characteristics. It is not by chance that the name Guadalmedina, coined in Muslim times by the Arab *Guad* (river) and *Medina* (city) means, literally, "river of the city".[1] Historically, Málaga has developed from three natural elements, which have fostered its development and defined the forms of its urban space: the Mediterranean Sea, a bridge able to connect Málaga to other European cities and beyond, as well as favouring the prosperity of trade; Mount Gibralfaro, which provided protection and shelter in case of need thanks to its large wooded areas; the Guadalmedina, bearer of drinking water.[2] As such, the river of

1. C. Gallardo Lopez, *Málaga y su rio Guadalmedina*, 1986, p. 364

the city has assumed, over time, a great symbolic value becoming a characteristic and strong identity for the city of Málaga. Hence the paradox: what in the past was seen, metaphorically, as the life-generating artery for the city, today is considered as a wound, a fracture of urban space that does nothing but divide it into two halves. This is because, following a series of historical vicissitudes and due to reckless management policies of its course, the river has undergone, over the centuries, a process of deterioration of its soils that brought it, to date, to present itself as a long linear vacuum, devoid of running water for most days and in a state of serious degradation.

2. P. Fernández Rodríguez, *El rio Guadalmedina. Estudios preliminares*, Universidad de Málaga, 2006, p. 3





The Guadalmedina River in numbers.

Lenght: 51km (6km urban)
Source: 1330 m
Surface: 180km^2
Flow rate: 30hm^3/year
Max flow rate: 161hm^3

FIG. 1 The route of the Guadalmedina River from the source to the mouth in the Mediterranean Sea.

THE RIVER THAT ISN'T A RIVER

From a geographical point of view, the Guadalmedina was, in the past, the western edge of the Phoenician settlement, defining the boundary between the urban and the natural environment that today forms the border of the historic center. Currently, in fact, the course of the Guadalmedina is centrally located in relation to the city, surrounded by urban space, passed from being a margin to an artery that cuts across Málaga in two well-defined halves. Its urban stretch, 6 of the total 51 km of its route through the Málaga's mountain ranges, affects more parts of the city, even different from each other, becoming an index of the gradient between the port city, the historic center and the suburbs. Its two banks, in the same way, are exemplary of the historical-cultural characteristics of the city and highlight them through the differences in the forms of urban space: one represents the historical half and is characterized by the dense and compact built fabric; the other, on the contrary, is characterized by the urban forms typical of the expansions of the middle of the last century. In this part of the territory, before they were built the urban geographies that today characterize it, were present in the past woods, meadows, fields and vegetable gardens, in a natural balance that guaranteed the maintenance of the river in conditions of structural stability and the prevention of disasters caused by weather events. Just consider, in this regard, the heavy rains that, in 1435, struck several areas



of the Iberian Peninsula so strongly as to cause catastrophic events such as floods in numerous Spanish cities.[3] On that occasion Málaga did not suffer serious consequences, thanks to the presence of the large bed of Guadalmedina (which already in the past did not enjoy large flows of water that crossed it) which acted as a reservoir of accumulation for meteoric waters. What are, therefore, the reasons that have led the river to act, today, in a way contrary to the past, or to be the cause, and not the remedy, of dangerous climate phenomena? The answer lies in the Spanish history from 1490 up until now. To protect and preserve the physical and territorial characteristics of the river, in fact, in that year the city passed a law prohibiting actions that could have soiled or polluted its waters.[4] However, in the following fifty years the economic development policies, promoted by the King himself and focused on the expansion of agricultural space, began heavy works of deforestation of its shores.[5] As a result, the riverbed, now devoid of vegetation that usually acts as a soil stabilizer and so weakened, became particularly vulnerable to climate phenomena and started to cause flooding more and more frequently and with increasingly large repercussions for the adjacent urban areas.

3. P. Trujillo y Tacón, *Memoria presentada a la Junta de Reales Obras de la ciudad de Málaga por su Gobernador el brigadier D. Pedro Truxillo y Tacon sobre los estragos que causa el rio de Guadalmedina á Málaga y arbritio para su remedio*, L. de Carreras y Ramón, 1802, p. 9-11

4. D. Joaquín Mª Díaz de Escovar, *El Guadalmedina. Apuntes historicos*, Cronista de la Ciudad de Málaga, 1919, pp. 3-4

5. M. Álvarez Calvente, *Málaga versus Guadalmedina*, in *Jábega n.1*, 1973, pp. 29-30

" El Guadalmedina es un rio tan propio de Málaga, que pasa lamiendo sus muros. "

Medina Conte, *Conversaciones historicas malaguenas*, 1789

DISASTERS PALIMPSEST

The occurrence of hydrogeological disasters is for Málaga a recurrent element in its history, so important that it has radically defined its forms and also its own position within the territory. The first settlement built in Phoenician times, in fact, was not located between Mount Gibralfaro and the Guadalmedina River, instead it was along the banks of the Guadalhorce. Only after several floods, it was moved to the point that today corresponds to the historic center of the city where, however, met, even after a few centuries, the same critical issues.[1]

As mentioned in the previous chapter, in fact, the deforestation policies, promoted after the *Reconquista* of the province of Málaga by the Catholic Kings, had disastrous effects on the hydrogeological balance of the Guadalmedina basin. What until then had been a river in symbiosis with the city that sprang along its course, had thus suddenly become a dangerous

1. A. Rubio Díaz, *Málaga. de ciudad a metrópolis. Tomo I: Del lugar a la ciudad*, Asociación Provincial de Constructores y Promotores, 2003, pp. 127-133

carrier of destructive climate events. From 1544, when a flood was officially recorded for the first time, to 1919 these catastrophic events became increasingly frequent, reaching an average of one every 7/10 years.[2] This real disasters palimpsest, which from the sixteenth century onwards has characterized the history of the Guadalmedina River as well as that of Málaga itself, has brought with it a series of consequences, on all the deaths of thousands of people due to the effects directly related to climate events. In addition to this, and the obvious damage caused to the buildings in its vicinity, the high frequency of disasters has led, from the social point of view, to a strong insecurity on the part of the population living near the Guadalmedina, with a consequent tendency to abandon the city in search of less dangerous places. Given the strong demographic decline due to this phenomenon, the King Carlos I in 1523 had even to prohibit, in periods characterized by frequent rains, the exit from the city by citizens[3], emblematic measure of to the seriousness of the situation.

2. F. Puche Vergara, S. Moreno Borrell, *Guadalmedina: río de la ciudad, río en la ciudad, todo el rio*, Red Andaluza de la Nueva Cultura del Agua, 2007

3. M. Álvarez Calvente, *Málaga versus Guadalmedina*, in *Jábega n.1*, 1973, p. 28

But how is it possible, in practice, that the human action towards Guadalmedina has led to effects of such magnitude? First of all, it must be said that, due to the impoverishment of the soil caused by the deforestation already mentioned, the river has undergone a transformation that has made it, in a few years, a torrential river. This means that part of its upper substratum, detaching



FIG. 1 Diagram of all floods which have affected parts of the city in contact with the Guadalmedina River.

itself in the first stretches of its course because of the friction of the water, has gone to deposit on the riverbed downstream, decreasing its maximum flow rate and consequently its ability to accumulate water in case of flooding. This, together with the loss of vegetation from the soil, which guaranteed a high stability and absorption capacity of meteoric water, led to the increase of exceptional water flows that, mixing with the soil and with debris of various nature, have been guilty of the destruction, over several centuries, of several bridges and buildings along the river. From the urban point of view, therefore, the Guadalmedina basin has undergone a redefinition of its spaces, which is still visible today observing the morphology of the nearby urban fabric. The shape of the city on both sides, for example, is different and does not always correspond to the opposite. At the time of the collapse of the bridges due to the floods, in fact, these were not always reconstructed at the same point; consequently, the two cities, the one to the east and the one to the west of the Guadalmedina, have not always developed in relation to each other seeming, sometimes, halves of two different apples.

Despite this, the most radical redefinition of the area around the river was linked to the works, mostly of an engineering nature, carried out in response to these climate factors. The need to mitigate its effects and to protect the city, as well as the citizens, was such as to have conditioned,

over the centuries, all the projects and visions for the Málaga of the future, overlapping with the issues that were usually addressed at the urban scale (military, hygienic, infrastructural) and generating the urban geographies that still today distinguish this portion of the city. Despite that, it is interesting to note that many of the projects designed to deal with the issue of Guadalmedina have never been realized. The first proposals, for example, considered the idea of diverting part of the water flow of the river by dividing it between some of the canals to which it is connected, or that of diverting the entire flow by defining a new route, at the west of the city, that never entered the urbanized space.[4] Both proposals, however, have been discarded because they were not economically viable. It is only two centuries later, more precisely from 1784, that they really begin to intervene on Guadalmedina, initiating the works of canalization of the river that will not be completed until centuries later. This type of project, chosen for its ease of implementation and because it was cheaper than the other alternatives considered, has thus led to the lowering of the level of the riverbed and the construction of concrete retaining walls on its sides, to increase the water storage capacity and to project the soil from its mechanical action.[5] At the time of building such walls, moreover, the section of the river in the narrowest points was widened, increasing the capacity of water accumulation; likewise, its natural sinuous form







FIG. 2-3-4 Historical images of the effects of the 1907 flooding, one of the most catastrophic.

4. D. Antonio Guzmán Muñoz, *El Guadalmedina. Antecedentes histórico*, Ayuntamiento de Málaga, 1907, pp. 35-42

5. I. Rojas, *Apuntes sobre la canalizacion del Guadalmedina*, Imprenta de la Viuda de Herrero, 1852

was, in some of its stretches, straightened, in order to limit the tortuousness and the inlets in which mud and debris could accumulate blocking the water flow. As these interventions were not sufficient to stop the occurrence of floods, more recently other projects have been carried out relating to the hydrogeological system of the city and its surroundings. From the 20th century, for example, it was decided to build some dams that would limit the flow of water from the various canals; between these structures, in total more than thirty within the Málaga's hydrographic system, particularly important are the Agujero dam, built after one of the most disastrous floods ever recorded in 1907, and the Limonero Dam, built between 1980 and 1983. These, on the other hand, were built along the course of the Guadalmedina, just north of the city, almost completely blocking its flow and creating a large artificial lake close to the Málaga's suburbs.

These solutions, to date, seem to have resolved the issue of the floods in Guadalmedina, so much so that since 1989 there have been no more catastrophic climate events. However, considering the impact of these projects on architecture and, more generally, on the quality of urban space, it is clear that they have generated an indefinite urban landscape, in stark contrast to the adjacent and heavily degraded parts of cities. In addition to living with a large dam a few hundred meters from the first residential areas of the city, in fact, Málaga today is divided from what is no longer a landscape element, but not even an urban one; a space that can only be defined by the absence of a project and that constitutes in effect a wound within its urban space. The Guadalmedina River, in fact, is complitely separate from the city, defining a fracture in its urban fabric.

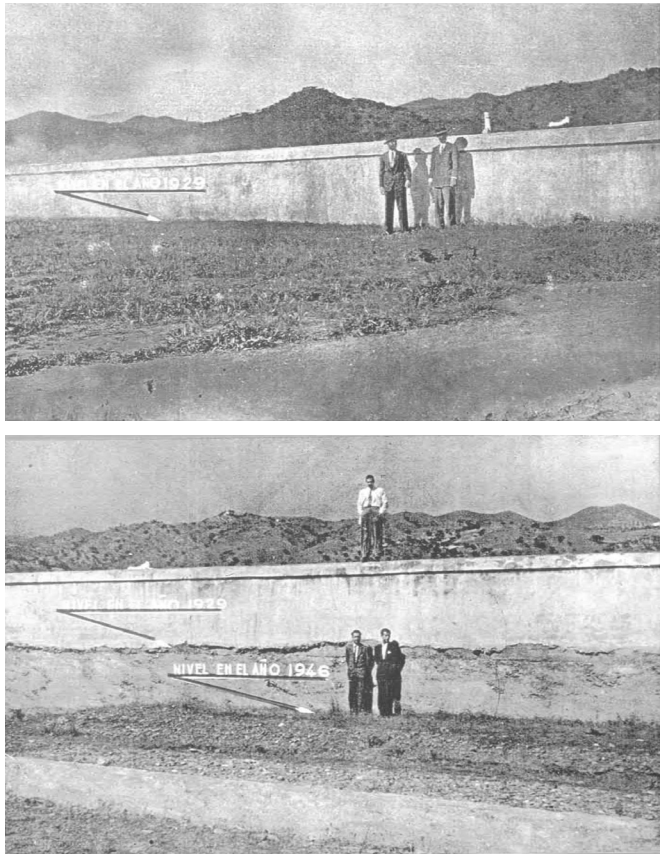


FIG. 5-6 The level of the Guadalmedina riverbed before and after the canalization works.

THE RIVER AS A FRACTURE







URBAN IMAGINARIES

An element that allows us to understand the potential that the Guadalmedina presents from the architectural and urban point of view are the numerous projects, proposals and initiatives that for centuries have followed each other in relation to its spaces. These represent the urban imaginary created around its figure by the time, an element so important that it is possible to affirm that *"a place exists as much in the imagination as it does in reality"*.[1] The aim of this chapter is therefore to investigate what the visions that have matured over the centuries were, ignoring the quality of individual projects but concentrating, instead, on how perceptions about such a space have generated different ideas about how to use it or rethink it. In analyzing this phenomenon, a substantial differentiation is made: on the one hand, in fact, the projects "from above" are investigated, that is those promoted by the municipality and therefore the result of a more political vision; on the other hand, it examines those initiatives that have come directly from citizens and small associations, that represent

1. U. Pfammatter, *Building for a Changing Culture and Climate: World Atlas of Sustainable Architecture*, DOM Publishers, Berlin 2014, p. 20

a more popular point of view. Finally, in order to understand also the state of the art, namely the most recent ideas and projects, the competition launched in 2012 for the rethinking of the areas around the Guadalmedina River was analyzed, which concentrates within it both the needs expressed by the municipality and the ideas of the many individual designers participating.

FIG. 1 Manuel Blasco, *La Málaga de comienzos de Siglo*, 1973. The river as one of the most important Málaga's public space.



The awareness of the considerations developed over time from both these points of view, in fact, is the prerequisite for the definition of a project that, in addition to defining spatiality what best integrates within the urban context, reflects ideas in the city's imagination, placing the citiziens once again at the centre of architectural and urban reflections.

FIG. 2 Manuel Blasco, *Recuerdos de Málaga y sus pueblos*, 1986. The river as one of the most important Málaga's public space.



VISIONS BY THE TIME

The projects that have affected the city of Málaga in relation to the Guadalmedina River over the past six centuries have been numerous. In the previous chapter some were analyzed, which had the objective of solving a specific problem in common, that is the hydrogeological one linked to the recurrent phenomena of flooding of the city. However, especially in more recent times, this type of proposals of a mostly engineering nature have been accompanied by considerations of a more architectural nature, which represent the visions that, in the various historical moments, the municipality and the designers had for the basin of the Guadalmedina. Looking beyond the technical problem of climate event management, these projects started from the identification of areas around the river as an undefined space, in contrast with nearby parts of the city and characterized by great criticality from the urban point of view; at the same time, however, they began from the awareness that Guadalmedina

could be an opportunity to redefine these parts of the city, allowing it to acquire its own character and identity and involving them in the processes of urban development. Although these proposals for the areas around the river were many, however, only a handful of these projects were actually implemented. Among these, moreover, no one has been able to significantly redefine the urban connotations of the Guadalmedina basin, but only to act on a small scale on some specific nodes. Hence the paradox: the part of the city that has always been the focus of attention of the designers and planners of Málaga is also the one that, to date, has remained unchanged compared to centuries ago, continuing to suffer the same condition of degradation and abandonment. One of the most important spaces for the city, both from a geographical and a socio-cultural point of view, remains therefore at the same time an unresolved place, devoided of identity.

The critical issues encountered in the act of designing this portion of the city, which is why most of the proposed projects were not carried out, were essentially two. The first consists in the difficulty to manage the space of the bed of the river at a technical-practical level; in fact, given its current conformation, developed following the interventions carried out in the past in order to defend the city from climate events, the Guadalmedina today is a great void that cannot be filled by a constant and significant flow of water, let

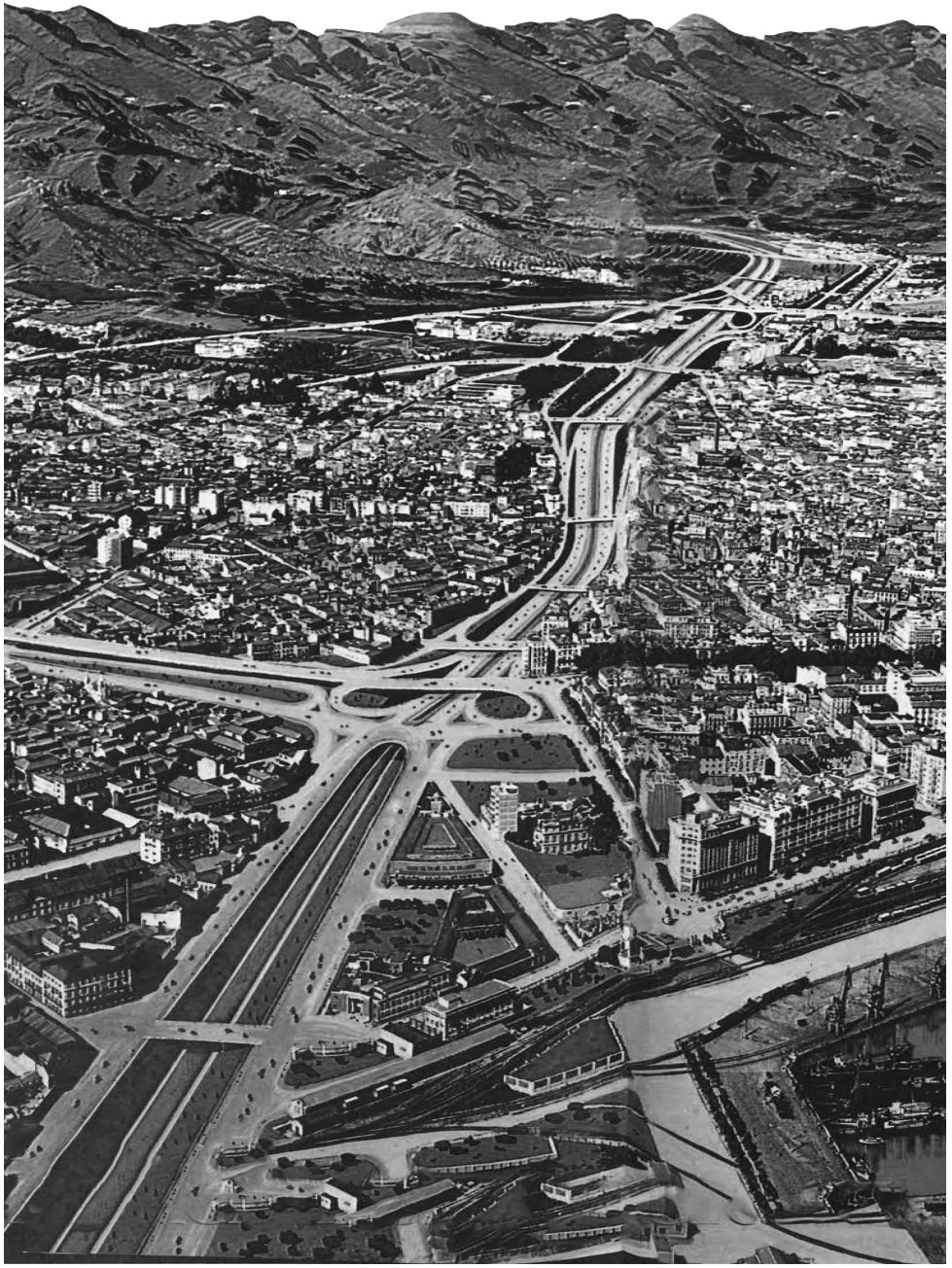
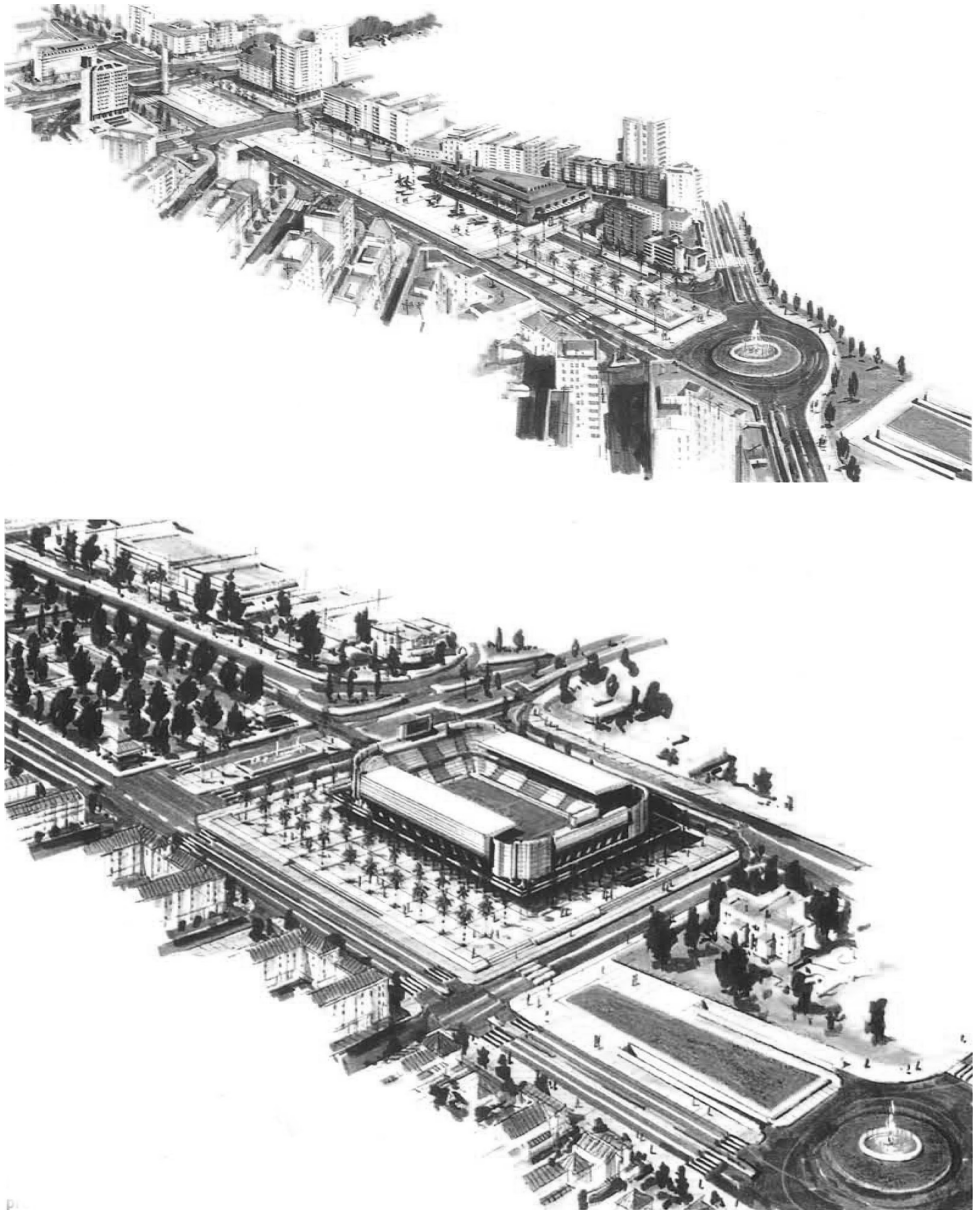


FIG. 1 Proposal of 1970 to build a highway on the Guadalmedina riverbed.

alone filled. This is because the surrounding urban space needs a reservoir to accumulate meteoric water during the most intense rains that protect it from flooding phenomena. Consequently, the bed of the Guadalmedina is destined to remain devoided of any element, architectural as well as natural, in its interior and for this reason some of the most ambitious projects for the redefinition of its spaces have never seen the light. Among these, the ideas of turning the riverbed into an urban stretch of the highway or into a pedestrian boulevard were particularly interesting.[1] Both of these proposals highlighted the potential of the river in relation to its shape and position within the city, interpreting it as a possible infrastructure suited to the needs of those years. Around 1970, in fact, the boom in infrastructure development has led to the construction of numerous highways, from which the idea of expanding within the urban environment exploiting the furrow traced by Guadalmedina; more recently, however, the tendency to pedestrianize larger and larger areas within the city has led to imagine converting the river into a boulevard that, in the opposite direction of the *Alameda* (the main longitudinal pedestrian axis), connects the area to the north of the city with the historical center. The second criticism, however, is from the economic point of view. If you consider the size of the Guadalmedina within the urban space of Málaga, in fact, it is easy to understand what would be the extent of a possible investment necessary for a redefinition.

1. F. M. Ruiz de Gordejuela, *Guadalmedina. Un proyecto vertebrador para la Málaga del siglo XXI. La obra de una ciudad*, in *Péndulo n° 12*, Colegio Oficial de Ingenieros Técnicos Industriales de Málaga, 1907, pp. 120-124



2. Fundación CIEDES, *Un Concurso de Ideas para un Proyecto Estratégico*, Gráficas Urania, 2015

FIG. 2-3 Proposal to build a boulevard on the Guadalmedina riverbed.

THE RIVER THAT ISN'T A RIVER

In 2012, then, a competition was launched for ideas for the reset of the river basin and the surrounding areas, while preserving the characteristics useful to ensure their safety in the event of flooding. Despite the obvious differences between the projects submitted, they have in common some criticalities that turn out to be the most interesting factors to consider since none of them was actually realized.[2] First, many of the projects have chosen to treat the entire course of the river in the same way (or almost so), despite the fact that they involve parts of cities that are very different from each other and therefore require different approaches. Secondly, they share a link with parts of cities adjacent to the river not particularly marked. The most important voids are in most cases filled by huge complexes of buildings, while the boundaries between river and city, or the banks, are often treated in such a way as not to allow a true integration between the two spaces. In relation with this investigation work, the study of the proposed projects is useful to highlight some ideas that, having been shared by many of them, represents the common will in relation to the redefinition of the spaces of the Guadalmedina. Among these, the most important strategy is undoubtedly the renaturalization of the river, operated through the demolition of concrete embankments and the recreation of the pending and sinuous morphology that the river originally presented.

Wanting to propose, to date, a new design solution for the Guadalmedina basin, it is therefore necessary to understand the potential, but above all the limits, of this atypical space. Only in this way, in fact, it is possible to imagine realistic scenarios. In this perspective, it is clear that any project imagined for the bed of the river must first co-exist with its morphology, not tending to change it in a radical way but trying to adapt in order to enhance its forms as much as possible; on the other hand, it is clear that each proposal cannot affect the entire urban course of the river, but must focus on a number of significant points which, by building a network of quality and interlinked spaces, triggers a process of development of the area. Each project, finally, should be think in a perspective of minimal intervention, conforming through small actions such as the rethinking of surfaces and the prediction of small structures useful as a support for the use of its spaces.



FIG. 4-5-6 Proposals for the redefinition of the Guadalmedina riverbed winners of the 2012 competition.

DIFFERENT WAYS TO LIVE THE RIVER

If you look at the architecture of the city of Málaga, from its most common and widespread forms to the elements that are exceptions, you can see that it is characterized by a certain uniformity and an almost total lack of strong architectural individuality. Even its most representative historic buildings, such as the cathedral or the castle, while distinguishing themselves from the rest of the urban fabric, when compared to those of other large Spanish cities are more modest in size as well as shape. It is for this reason that, although Málaga is a palimpsest of different cultures that have followed each other over time, today it does not present itself as a patchwork of different parts each with a distinct style, but rather with a unitary character. This trend should not be confused with a lack of specificity of Málaga's architecture because, on the contrary, it is the tangible expression of its egalitarian mentality.[1] The development of the urban area is the result of these ideologies, which are expressed in the

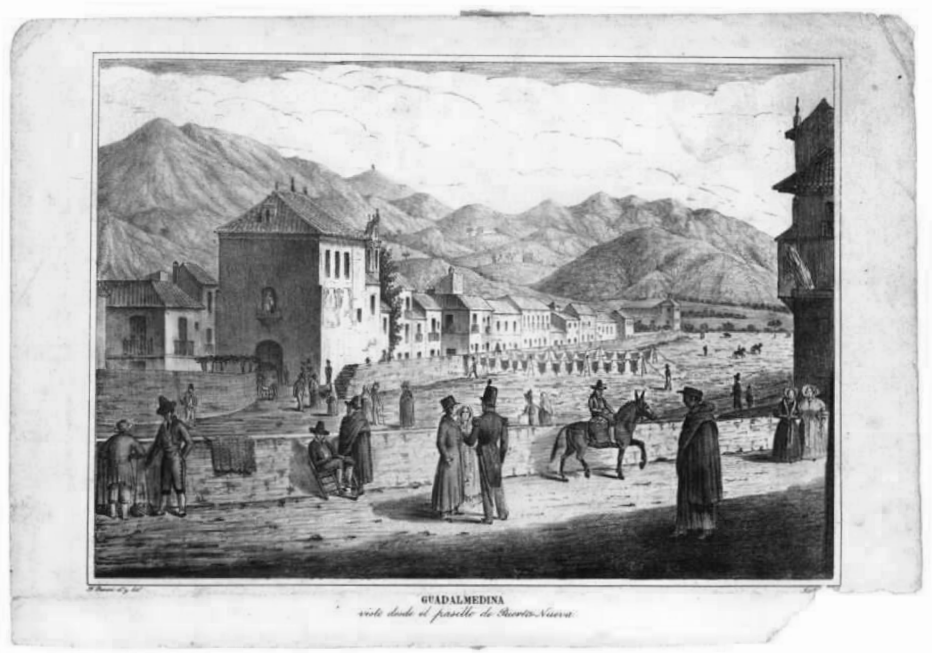
1. The information contained in the first part of this sub-chapter is the result of an interview with Susana García Bujalance, Professor of Urban Planning at the University of Málaga.

absence of strong economic polarities (large industries, administrative centers, farms with large portions of territory) replaced by a long series of small and medium-sized enterprises. Consequently, the architecture could only follow this trend and develop as an archipelago of small realities scattered within the urban area. This fragmentation, opposed to the landowner character diffused in most of the Andalusian cities, distinguishes Málaga, becoming an identity character.

In this urban landscape, atypical compared to that of other major Spanish cities, the Guadalmedina is an exception. Given its particular shape, which makes it in all respects a potential public space usable within the city, and its big size, in fact, the axis of the river is an element that stands out compared to the surrounding context of the city. For this reason, the river has always been one of the most important landscape and urban elements of Málaga and the center of the attention of designers and citizens themselves. In this regard, it is interesting as paradoxical that, although it has remained substantially the same in its forms over the centuries dispite the numerous projects proposed, as explained in the previous chapter, different perceptions have alternated in relation to the Guadalmedina riverbed, which in turn have generated different spontaneous ways of living its spaces.

Firstly, the dry bed of the river has always been seen as an element of separation of the urban space of the city. In this sense, the Guadalmedina has gone from being seen as a limit of the city, that is, the element able to protect it from invasions, to being perceived as an unbridgeable fracture in the center of its urban space. In addition, the almost perennial absence of running water, which characterizes the bed of the river for the most of the time, makes it seen not as a landscape element, but only as a long linear void with no identity, as a wound in the urban fabric. On the other hand, these atypical conditions in the area of Guadalmedina have opened the way to several more positive ways of interpreting its space: the lack of a stable flow of water has made it a continuous bridge between the two sides; the absence of buildings, especially in the dense areas of the center, highlighted its potential as a public open space; the presence of areas where vegetation has naturally covered the soil has revealed its ability to become an important green space; finally, its location and the considerable length of the course of the river have made it an important route that crosses the city from north to south.

These ways in which the spaces of the Guadalmedina have been perceived by the citizens have become real through the use that has been made of them. While some of these spaces have been used mainly as a transit space,



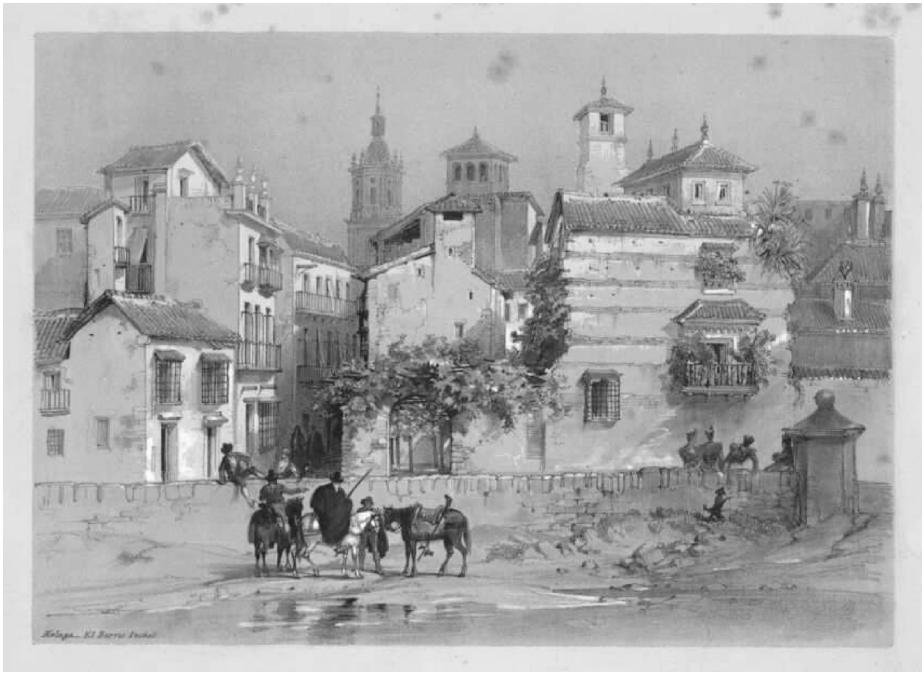


FIG. 1-2 Historical drawings of the Guadalmedina River and its relation with citiziens.





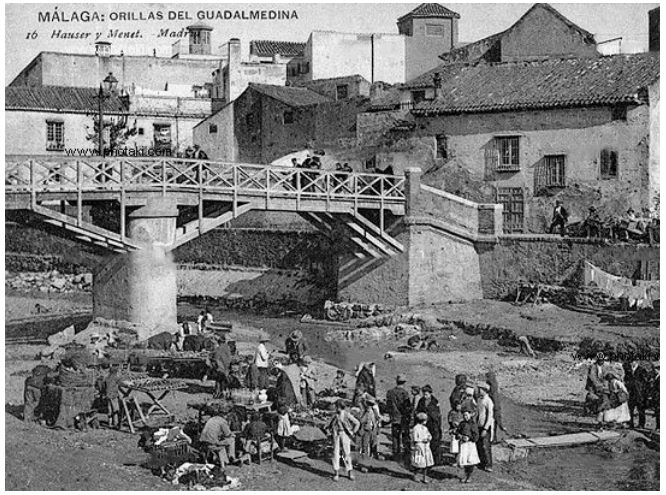


FIG. 3-4-5 Historical photos of the Guadalmedina River and its relation with citiziens.

between the two banks or between the areas to the north and south of the city, others have become spaces of public life, hosting different activities: from play space for children to home of local markets, from wagon storage to area dedicated to sports. This condition has continued over time, showing for each historical period the different needs of citizens; common to all these phases is, however, the will to incorporate the basin of Guadalmedina in the dynamics of society. Currently, after a phase of partial abandonment of these functions, the area of Guadalmedina has returned to host sporting events and cultural activities related to the world of art, thanks to public initiatives aimed at its re-functionalisation promoted by foundations and sometimes by the citizens themselves.







FIG. 6-8 Boys playing football in the Guadalmedina riverbed.

FIG. 7 Alfonso XIII on the day of the laying of the first stone of the Aurora's bridge.



FIG. 9-10 A woman walking with her dog in the riverbed and boys chatting in its spaces.



FIG. 11-12 A guy skating in the riverbed and two guys kissing each other in the same place.





THREE FACES OF THE SAME RIVER

Wanting to investigate more deeply the morphology of Guadalmedina, we must make a first great differentiation between the two main parts that constitute it. The first is the one that goes from the source to the Limonero Dam, and is the most natural and wild part of the river, which crosses the crown of mountains surrounding Málaga. Characterized, as in the rest of its route, by an almost perennial lack of water inside, the Guadalmedina in this section fits completely within the landscape context, arriving at some points to blend in it. The second part, instead, corresponds to its urban stretch within the city of Málaga. If you look at its shape in this section, it is evident that one of the most interesting features of the Guadalmedina is its ability significantly to change its morphology along its path within the city. In doing so, the riverbed adapts to the forms of the built fabric and open spaces, highlighting the differences between the various parts of cities that alternate in the north-south axis and defining urban geographies also very different from each other.

In particular, it is possible to subdivide the course of the river into three sectors, corresponding to the northern, central and southern sections of its urban layout, underlining differences as the materials of the surfaces (more or less natural), the morphologies of section and the relation within the city. The latter is represented by the accesses, stairs but also ramps and descents, that are very different from both the numeric and the typologic point of view in the three "faces" of the river. In the same way, the section of the river change a lot alongside its urban route, passing from being tight and with a clear detachment with the city to areas where the descent is more gradual and defined through terraces. Defining the characteristics of each stretch, then, it is possible to grasp the relationships that they have established with the parts of cities in which they fit and imagine, therefore, different possible approaches and different design scenarios.



FIG. 1 The changing section of the river along its urban stretch.

ACCESSES: THE LINK BETWEEN RIVER AND CITY









CONCRETE BOX

The first stretch of the Guadalmedina River, starting from its southern end that coincides with the point where it flows into the Mediterranean Sea, crosses some of the most crucial areas of the city. In the southernmost part, it fits into the context of the port, a space that has always been of fundamental importance for Málaga, dividing it into two parts. Being in contact with the sea, this stretch is the only one in which the bed of the river is covered by water permanently. Although there is no current flow (water, contrary to what usually happens, does not come from the hinterland but from the sea, of which it is the extension), this portion of the river is however peculiar, as it allows to observe what could have been the urban landscape of the areas around Guadalmedina if the latter were not in a dry state for most of the time. Above the port area, the river then meets the historic center, of which defines the west end as in the past defined the limit of the Phoenician and Roman city. In this stretch, the expansion of

the urban fabric has led to a compression of the spaces of the river, which therefore presents itself with the smaller width of its entire stretch. Since the shape of the city has developed according to its morphology, moreover, the Guadalmedina is more sinuous in this section, surviving at least in part to the works of straightening of its route carried out in previous centuries. On the other hand, however, the river in the southern part is also the one with the greatest presence of gray surfaces. The concrete, used for the construction of high boundary walls to reinforce the capacity of the natural embankment to contain large flows of meteoric water, is in fact also present in the horizontal surface here, defining a real artificial landscape, hard and devoid of any form of naturalness, which contrasts sharply with the scenic nature of the river. The element that had as its objective to protect the most populous part of the city, that of the historical center, has generated as a consequence a big urban void not up to its next context, solving one problem but creating another at the same time. In addition, despite attempts to repair the relationship between the two banks, through the construction of several bridges, including pedestrian, and systems of stairs and ramps that allow direct access to the spaces within the riverbed,[1] the Guadalmedina in this section constitutes a highly degraded urban void, little lived and characterized by the proliferation of illicit activities. What is more, from a climate point of view, the large

1. *Guadalmedina. La recuperación para la ciudad de un espacio central*, Ayuntamento de Málaga, 2000

concrete body is an element that encourages the formation of environmental phenomena such as the heat island and in general the rise of surface temperatures, as well as increasing the runoff velocity of the meteoric waters flowing within. It is true, in fact, that the presence of the embankments allows the accumulation of large flows of meteoric water within the riverbed; however, it should be taken into account that in the case of an exceptional climate event causing an overflow this would be even more dangerous, given the high speed of water due to sliding on surfaces made impermeable and the elimination of natural creek. Finally, since the southern part of the Guadalmedina is the closest to the historic centre, it is in this area that the various activities of exploitation of the riverbed as a public space have been concentrated. For this reason, trying to imagine a possible design approach in this area it is evident that, in addition to operating a renaturalization, at least in part, of its surfaces, it is necessary to realize devices and structures (that given the unstable climate nature of the river can be thought of as temporary) to support the uses, even spontaneous and not totally defined, of its spaces. Given the strong presence of elements of connection between the river and the city, in fact, this specific stretch of the Guadalmedina lends itself better than all the others to become a multifunctional public space and to actively interact with other spaces of the city.

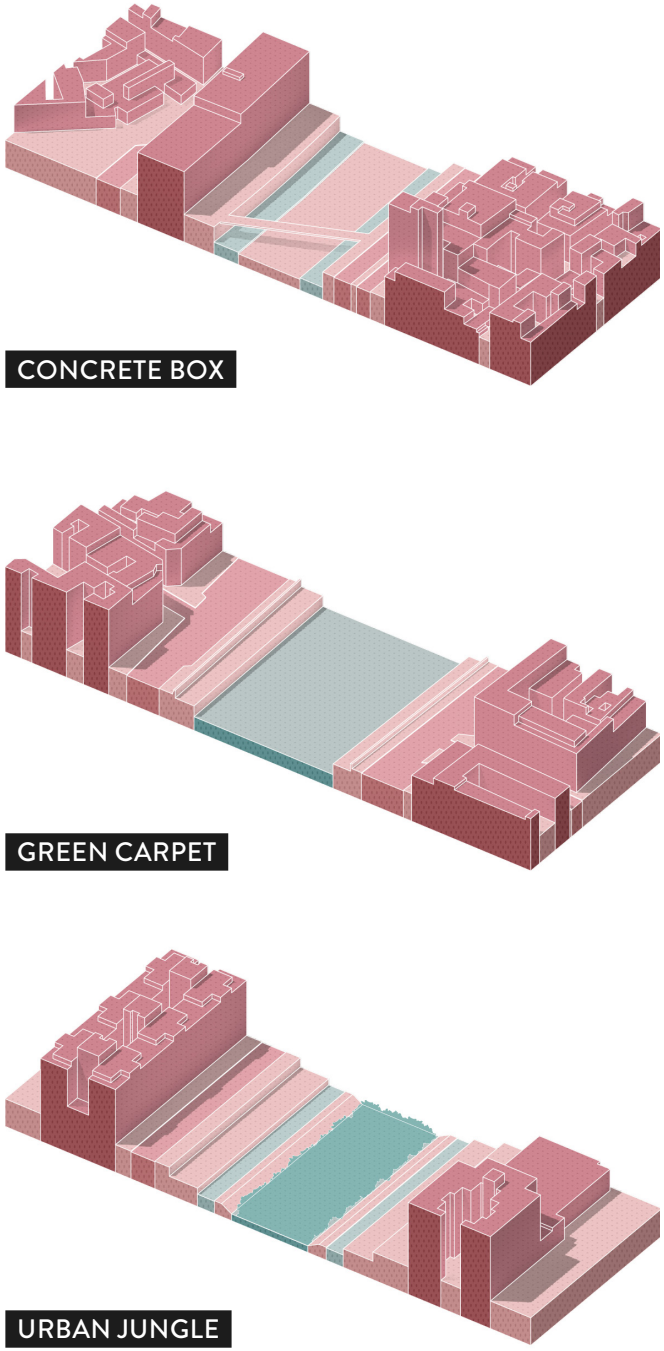


FIG. 1-2-3 The three different sectors of the Guadalmedina River.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DRINKS
FRIENDS

URBAN JUNGLE

The Guadalmedina River in its northern section, just below the Limonero Dam, crosses, instead, a portion of the peripheral city, defined since the sixties of the twentieth century. In previous times this area was not urbanized and, as a result, it was part of the surrounding landscape of the city; in particular, the basin of Guadalmedina had large wooded areas, later turned into spaces for agricultural use. To date, this stretch of the river, although being flanked by the urban fabric of the city, is quite large, presenting the widest section of the river of its entire route within the urban space. Given its characteristics, this section of the river stands as a real extension of the landscape context that, through this important natural axis, fits within the urban context opposing to it. The surface of the bed is in fact covered, as well as by a high grassy surface, by a thick wild and uncontrolled vegetation, ranging from small shrubs to trees even higher than the banks of the river themselves. Because of this strong green

presence, the spaces of the river in this section are completely inaccessible; for this reason, the relationship between the Guadalmedina and the city, or more particularly with citizens, is only visual and based on appreciating its natural forms within a context where they are not usually present. The same elements, similar to pedestrian walkways, formed by the terraces shape of the banks and which therefore flank the river parallel to it, can be read, in some specific places, as points of view defined to enjoy the atypical urban landscape, even if they are not meant to be crossed. To think of modifying these spatial connotations that characterize the Guadalmedina in its northern urban stretch is utopian, as it would constitute a pharaonic activity carried out in a part of the city that is not the focus of attention of the municipality. In addition, preserving these authentic natural forms within the urban space must be a priority for an urban project, as it generates an extremely interesting urban landscape and an important green space for the city. Consequently, in order to enhance this strong identity, it is possible to approach the project by imagining structures, such as suspended walkways and addressed viewpoints, designed to improve the usability of its surroundings and enhance the features already present, as well as, of course, to provide maintenance of the green to prevent discomfort factors for people.













GREEN CARPET

The central section of the Guadalmedina, enclosed between the two mentioned in the preceding paragraphs, can only be defined as an immense green carpet. The remarkable width of its section, together with the regular shape and the almost total lack of height differences, makes it look like a huge lawn designed in a geometric way. From a material point of view, this stretch of the river has a strong presence of natural and permeable surfaces, covered with a turf and a mixture of plants and small shrubs that draw, unknowingly, what is effectively one of the most important and fascinating green spaces in the urban environment of the city. Crossing the various bridges that pass over it, in fact, the river appears as a window on the Málaga's landscape that, in addition to generating suggestive views, constitutes a green corridor for flora and fauna that reconnects them to the territorial area. Despite these qualities, however, this sequence of spaces within the river is not particularly enjoyed

by citizens and as a result, is not being valued and in a state of serious degradation and neglect as well as the rest of its route. The main reason why it is not integrated with the city that flanks it is the height of the retaining walls that, in this particular portion of the Guadalmedina, are such as to prevent, in some sections, the view of the interior of the riverbed and that of the opposite bank. This creates a net boundary that separates and isolates the river from the other surrounding shapes of the city. This limit, however, is made even more evident by the lack of elements of connection, which result in a handful of ramps that do not allow convenient access nor an organization of flows. For this reason, a reflection of a design nature about this portion of the urban tract of Guadalmedina can only wonder how it is possible to work on the boundary between river and city, promoting a more fluid and direct relationship that allows to enjoy its spaces, which are preserved as a void, and demolishing the highest walls in order to restore a visual connection.








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p. 101-103 / The Guadalmedina River in its southern part, 2021. Photo: personal

p. 104 / The route of the Guadalmedina River from the source to the mouth in the Mediterranean Sea. Source: personal drawing

p. 106 / Boys chatting inside the river, using it as a public square, 2021, Photo: @ma.me.n

p. 110 / Diagram of all floods which have affected parts of the city in contact with the Guadalmedina River. Source: *El Avisador Malagueño n. 82-83-84*, 2015-2016

p. 113 / Historical images of the effects of the 1907 flooding, one of the most catastrophic. Source: *Memoria gráfica de España. Riada de Málaga en 1907*, in *www.vicenticoaa.blogspot.com*

p. 115 / The level of the Guadalmedina riverbed before and after the canalization works. Source: José Ángel Carrera Morales, *La repoblación forestal de la cuenca del Guadalmedina, en defensa de la ciudad de Málaga*, in Manuel Olmedo Checa (edited by), *Pendvlo n. 9*, Colegio Oficial de Ingenieros Técnicos Industriales de Málaga, 1997, pp. 86-87

pp. 116-117 / The river as a fracture, blocking the view between the two banks with its high walls. Photos: personal

p. 120-121 / Manuel Blasco, *La Málaga de comienzos de Siglo*, Instituto de Cultura de la Diputación de Málaga, 1973 (on the left). Manuel Blasco, *Recuerdos de Málaga y sus pueblos*, Colegio oficial de aparejadores y arquitectos técnicos de Málaga, 1986 (on the right). The river as one of the most important Málaga's public space.

p. 124 / Proposal of 1970 to build a highway on the Guadalmedina riverbed. Source: Pablo Fernández Rodríguez, *El rio Guadalmedina. Estudios preliminares*, Universidad de Málaga, 2006, p. 12

p. 126 / Proposal to build a boulevard on the Guadalmedina riverbed. Source: Francisco Merino Ruiz de Gordejuela, *Guadalmedina. Un proyecto vertebrador para la Málaga del siglo XXI. La obra de una ciudad*, in *Péndulo nº 12*, Colegio Oficial de Ingenieros Técnicos Industriales de Málaga, 1907, pp. 122-123

p. 129 / Proposals for the redefinition of the Guadalmedina riverbed winners of the 2012 competition. Photo: Fundación CIEDES

p. 133 / Historical drawings of Guadalmedina and its relation with citiziens. Source: Pablo Fernández Rodríguez, *El rio Guadalmedina. Estudios preliminares*, Universidad de Málaga, 2006, pp. 20-21

p. 134 / Historical photos of Guadalmedina and its relation with citiziens. Source: Pablo Fernández Rodríguez, *El rio Guadalmedina. Estudios preliminares*, Universidad de Málaga, 2006, pp. 22-24

p. 136 / Alfonso XIII on the day of the laying of the first stone of the Aurora's bridge, 1921. Source: www.wikipedia.com

pp. 136-137 / Jose Antonio Berrocal, *El Perchel: retazos de memoria* (exposition), Málaga, 2015. Boys playing football in the Guadalmedina riverbed. Photo: Jose Antonio Berrocal

pp. 138-139 / A woman walking with her dog in the riverbed and boys chatting in its spaces, 2021. Photos: personal

pp. 140-141 / A guy skating in the riverbed and two guys kissing each other in the same place, 2020, Photos: @ma.me.n

p. 145 / The changing section of the river along its urban stretch. Source: personal drawing

p. 146-147 / Different types of accesses, that are the link between the river and the city, 2021. Photos: personal

p. 151 / The three different sectors of the Guadalmedina River. Source: personal drawing

pp. 152-179 / The photos in these pages represent a photographic report of the differences between the three part of the river, 2021. Photos: personal

04

LEARNING FROM GUADALMEDINA

RE-CONNECTIONS

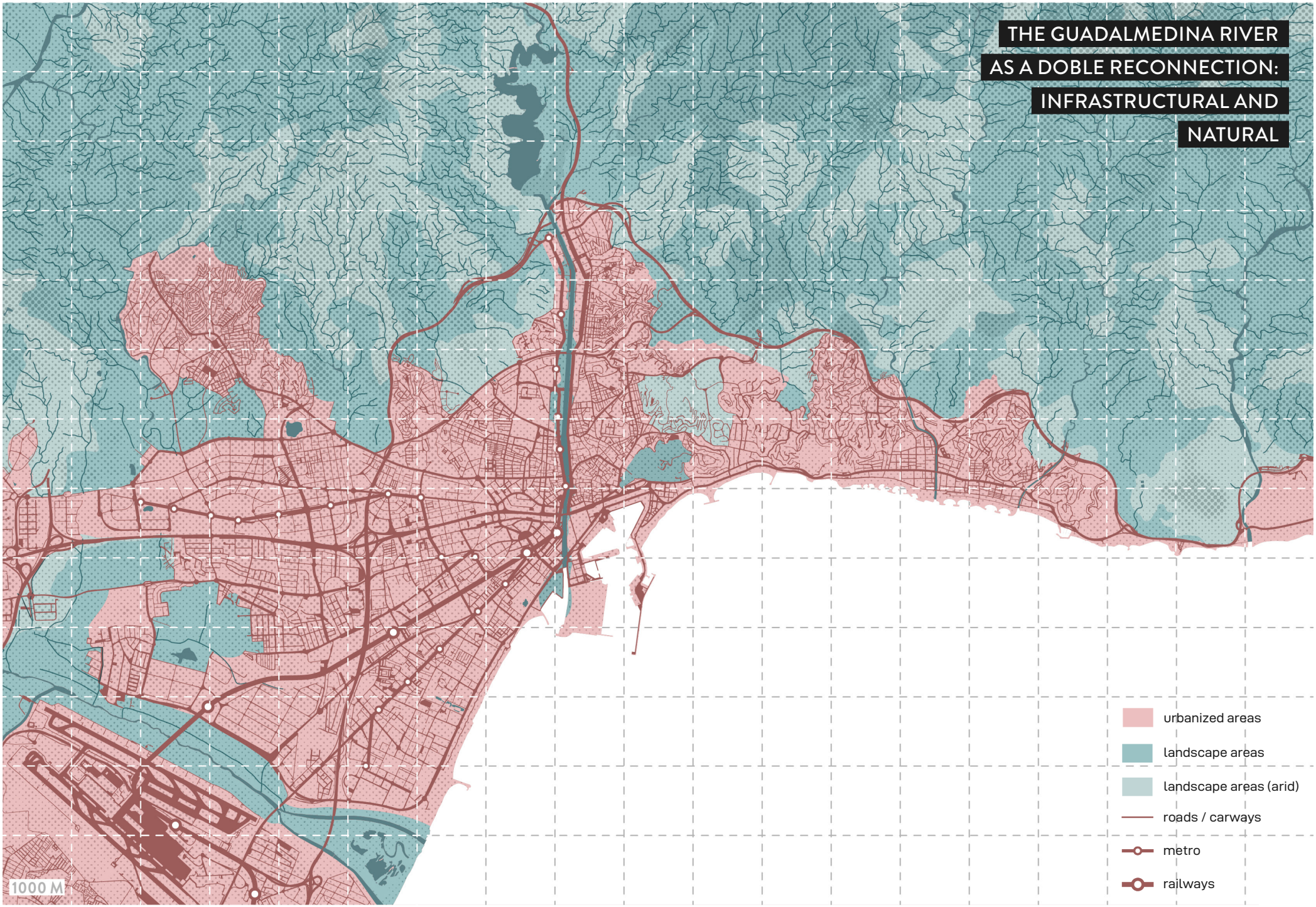
Going beyond the usual analysis of the spatial conditions of a place, its geographies and its historical precedents that have shaped its current morphology, as well as its socio-cultural characteristics that define its city identity, it is possible to make some further readings that, investigating more deeply and from unusual points of view, are able to grasp its true essence. This chapter identifies, in this regard, three different degrees of reading the subject of the research, namely the river Guadalmedina in its urban stretch. The importance of this part of the investigation lies in the recognition of the river as a space that hides an enormous potential from the urban point of view, which is not currently fully exploited. Overcoming the first impressions about the Guadalmedina, which lead to think of the river as the simple summation of the criticalities that it generates for the cities, this part of the thesis is in fact aimed at highlighting its qualities, spatial but not only, and the opportunities it generates from the design point of view. In this way, it becomes a model that, after being studied

and fully understood, can be valorized and even reproposed in its best aspects when imaging new projects of urban space.

The first of these readings looks at the Guadalmedina as a longitudinal axis. As already stated, the river, thanks to its considerable length with which it crosses the city of Málaga and especially to its transverse direction, is the only element capable of redefining urban geographies opposing the historical linearity dictated by the coastline in relation to tourism development. In addition to being a fundamental element of union between the two sides and therefore between the two different parts of the city, in fact, the Guadalmedina is also a possible tool for the reconnection of urban areas along the north-south axis. Looking at it from this point of view, the river as a linking element has a double value: on the one hand, in fact, it can be seen as a possible new infrastructure axis; on the other hand, it can be interpreted as a long green corridor directly linked to the landscape of the city.

" Evolutionary infrastructure is both projective and pragmatic - a prototypical ideal that is intrinsecally agile, capable of optimizing ecological and social extremes, and that leverages the stray spatial consequences of preexisting infrastructures. "

Marion Weiss, Michael Manfredi, *Evolutionary infrastructure*, in, *Climates: Architecture and the Planetary Imaginary*, 2016, p. 150


THE GUADALMEDINA RIVER
AS A DOBLE RECONNECTION:
INFRASTRUCTURAL AND
NATURAL
urbanized areas
landscape areas
landscape areas (arid)
roads / carways
metro
railways
1000 M

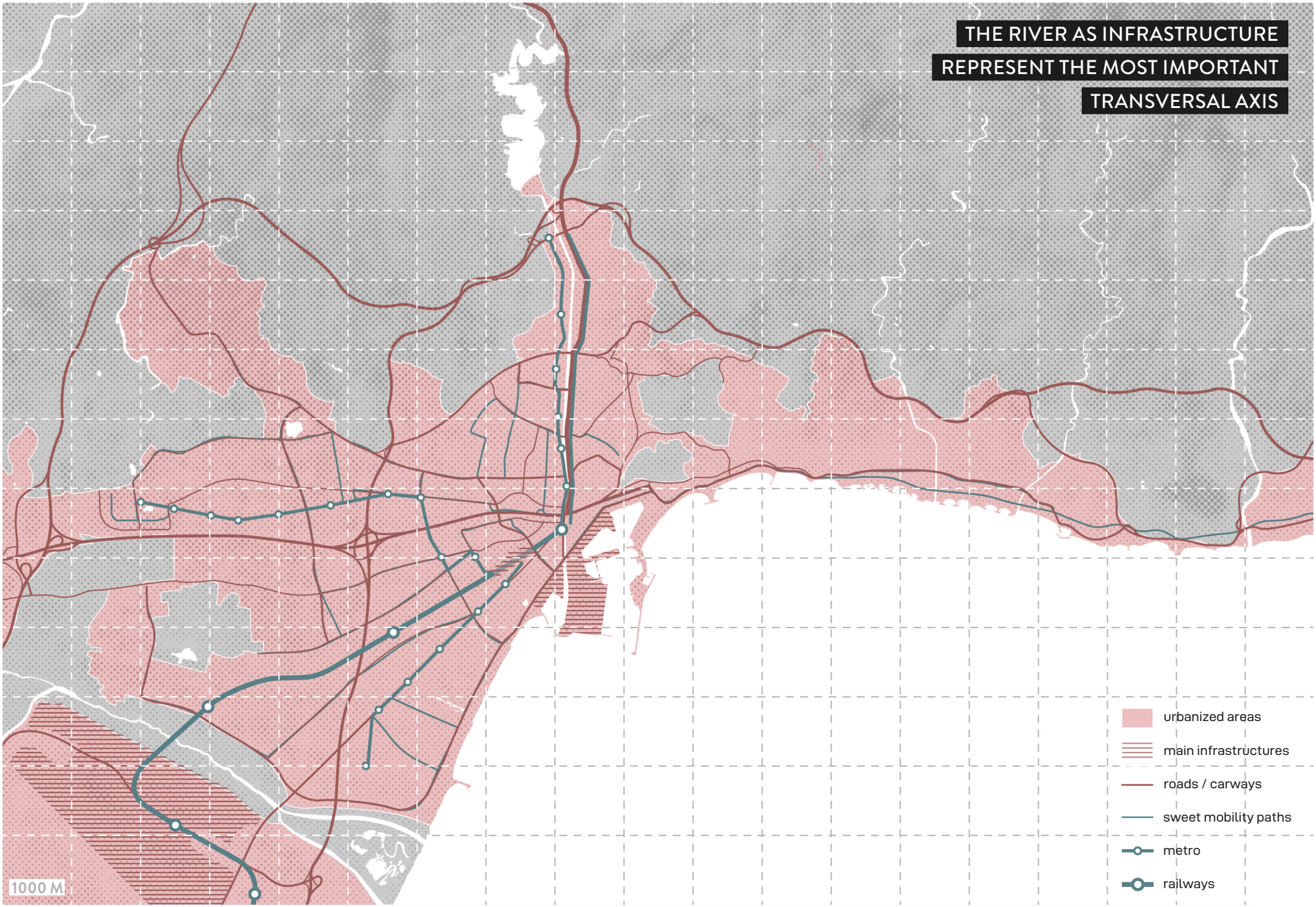
RIVER AS INFRASTRUCTURE

The concept of infrastructure has always been deeply linked to the one of the city. Today, as in the past, every urban center develops from those elements, such as roads, bridges, railways, which allow a use of the spaces as well as direct communication with other settlements. In recent times, the idea of infrastructure has become central in urban and city planning, as from the sixties has been the engine of urbanization, undoubtedly the phenomenon that has most transformed the forms of cities in the last century. However, even before then the infrastructure, understood with a wider meaning than in the twentieth century, monopolized and often almost identified with the concept of street, has been the backbone of every city and as such has always played a central role in defining its spatialities. An example is given by some of Palladio's projects, mostly ecclesiastical buildings, made in Venice. Taking up an analysis proposed by Pier Vittorio Aureli[1] and observing their position within the

1. P. V. Aureli, *The possibility of an absolute architecture*, MIT Press, 2011, pp. 68-73

urban fabric of the *Serenissima*, in fact, it is possible to note that they follow a very precise alignment, at the limit of sixteenth-century Venice. This, defined through the design of large walls that acted as containment margins but at the same time welcomed functions typical of a public space, was one of the most important infrastructures of the city and, in the case of the buildings of Palladio, an element able to draw the urban forms of the city, concentrating around itself several of its buildings.

Likewise, Málaga's river is an infrastructural element able to rethink and regenerate the spaces around it. Given its shape and its position within the city, in fact, the dry bed of the river has always been seen as a groove already traced, ready to accommodate flows of vehicles and people but also activities of public life, and for this center of reflections and projects aimed at exploiting these characteristics. After having imagined, as seen in the previous chapter, to transform it into a large highway that ran through the urban area or to fill the void and make it a long pedestrian boulevard, today the Guadalmedina defines with its shape the layout of a new metro line, only planned for the time being, which connects the various parts of the city met by the axis of the river, from the port to the Limonero Dam. On the other hand, given its uninterrupted continuity and its materiality, the river can easily be interpreted as a long cycle-pedestrian route, so much so


THE RIVER AS INFRASTRUCTURE
REPRESENT THE MOST IMPORTANT
TRANSVERSAL AXIS
urbanized areas
main infrastructures
roads / carways
sweet mobility paths
metro
railways
1000 M

that in part it is already used in this sense today. The potential and scope of a project that stems from this rediscovery of the Guadalmedina as an infrastructure axis are such as to redefine the very character of the city. In the first place, in fact, this would be in opposition to the mono-directionality of today's Málaga, finding in the transversality of the river a new route for urban development. Given the saturation of the areas of the old town and coastal, dense of residential buildings and structures mainly supporting the tourist activity, it is evident that a rediscovery and a rapid development of inland areas are the key to a sustainable city growth. On the other hand, if you look at the forms of the city of Málaga, it is clear that the axis of Guadalmedina defines a gradient between a central urban area to the south, and a strongly peripheral in the north, which requires an important infrastructure reconnection in order to be able to open up to urban regeneration initiatives. Stemming from the need to rapidly expand urban space in relation to the uncontrolled demographic development of the post-war period, this part of the city in the northern area is in fact extremely detached from the context and consists of urban and architectural forms of low quality. The city plan is a tangible proof of this clear differentiation between the most developed parts of the city and the suburbs: the dense and organic fabric of the old town, or that also rich areas along the coast, are in fact opposed to the morphologies of the built, defined by the serial

repetition of standardized architectural objects, operated only to fill the space available with as many housing units as possible. Moreover, crossing these spaces, we realize how much the lack of services and attractive elements generates desolate and lifeless landscapes, with urban voids that do not function as public spaces but simply as the opposite of the full. The river is therefore an opportunity to rethink these parts of the city, but also to reconnect them, physically as ideally, with its center.

" Such a reexamination of infrastructural space involves the recognition that all types of space are valuable, not just the privileged spaces of more traditional park and square, and they must therefore be inhabitable in a meaningful way. "

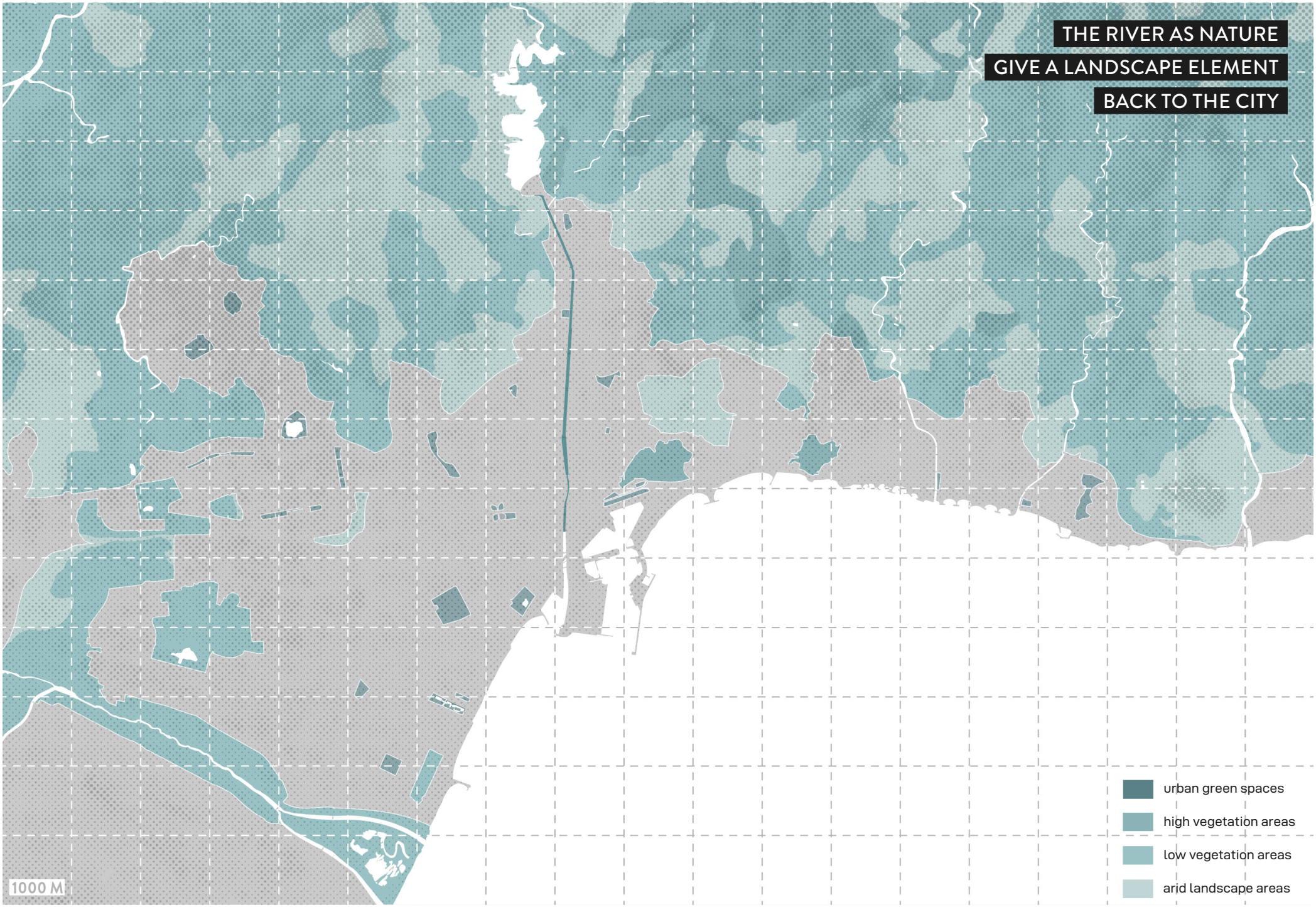
Charles Waldheim, *Landscape as Urbanism*, in Charles Waldheim, John Irving, *The Landscape Urbanism Reader*, Princeton Architectural Press, 2006, p. 171

RIVER AS NATURE

If, on the one hand, as seen in the previous chapter the Guadalmedina River can be interpreted, because of its potential for reconnecting the various parts of the urban space of the city, as an infrastructure, on the other hand it is by its very nature a landscape element. Despite having lost, following the projects carried out since the seventeenth century, the typical spatial features that generally identify a river, in fact, the Guadalmedina can still be considered today as a naturalistic element within the urban space of Málaga. This is because the absence of a constant flow of water within its bed has caused the river to develop a strong vegetal presence that, influencing its appearance and forms, makes it today perceived as part of a natural ecosystem, even if not of a fluvial type, and which, for this reason, can generate new urban geographies highly linked to the characteristics of the city. In this sense, and given its elongated morphology that leads it to cut across the city from its

northernmost parts to the sea, the Guadalmedina can therefore be defined as a double element of reconnection, adding to its potential as an urban infrastructure the characteristics that make it a green corridor able to link the city to its landscape and territorial context.

This second type of reconnection is particularly important for the city of Málaga, especially if the characteristics of its current green spaces are analyzed. As for the territorial area, at first glance it might seem that the city is bordered by a green crown, a rich surrounding of great naturalistic value. This is partly true, as for example in the north-east of the city opens the *Montes de Málaga* nature park. However, looking more closely at the characteristics and qualities of these landscape areas, it is clear that most of them are actually semi-arid territories, covered by a little dense subdesertic vegetation, sometimes completely absent. This type of landscape is the result of a process of soil degradation, due to climate change and the consequent expansion of areas at risk of desertification, as well as the increasing scarcity of water resources and the deforestation works carried out over the centuries in order to obtain arable land, at a time when agriculture was by detachment the most important economic sector. To date, however, an awareness of the problem and the repercussions it may have on the lives of its citizens has been raised of a plan to reforest these areas at the


THE RIVER AS NATURE
GIVE A LANDSCAPE ELEMENT
BACK TO THE CITY
urban green spaces
high vegetation areas
low vegetation areas
arid landscape areas
1000 M

north of Málaga, that has already seen the renaturalization of large portions of territory especially around the river Guadalmedina.[1] As for the urban environment, instead, looking at any map of the city it is easy to realize that there is a great shortage of green spaces, definitely not sufficient considering them in relation to the size of the urbanized area. Of the few green areas present, moreover, many are for private use and therefore not accessible to the public.

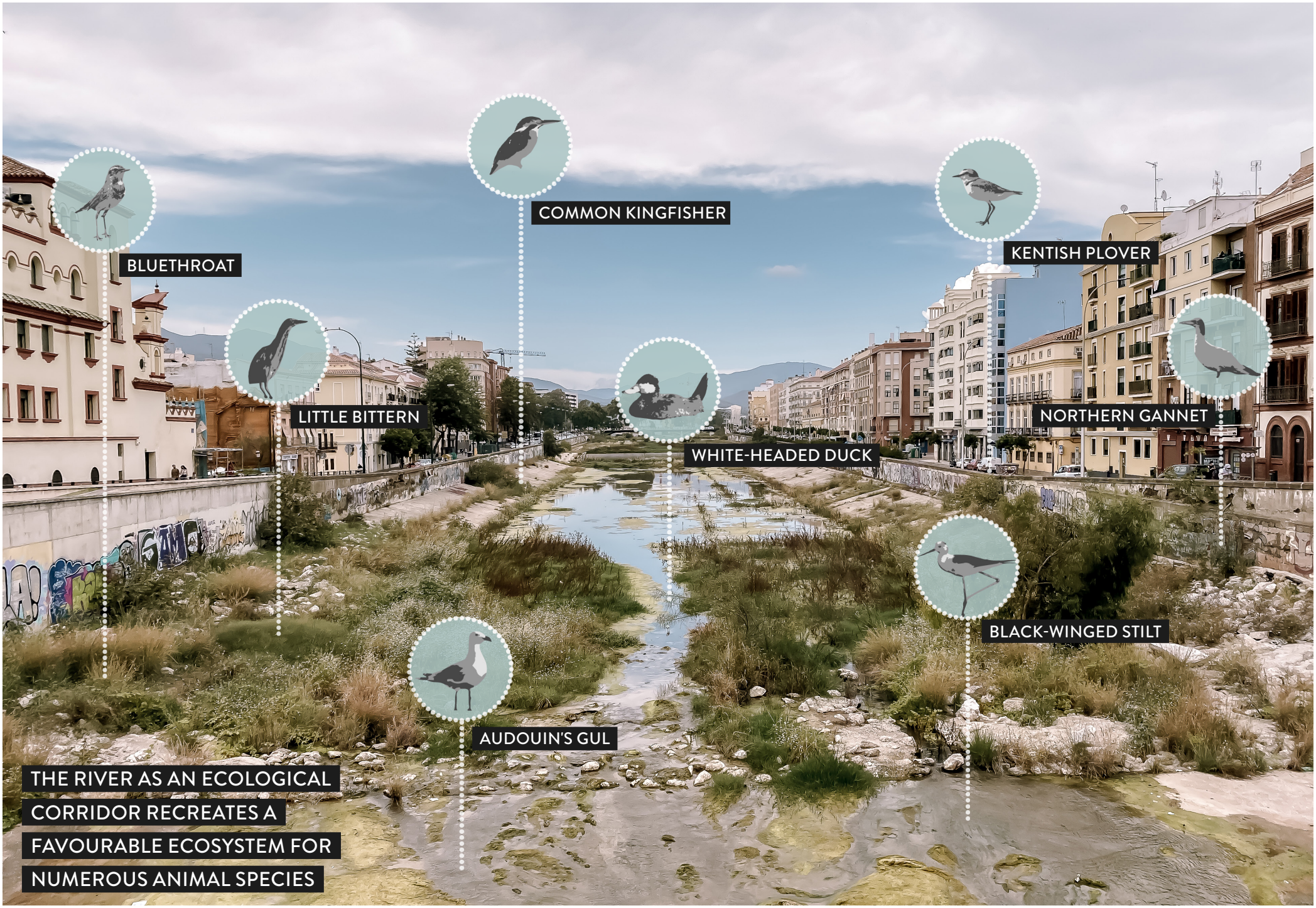
Seen from this point of view, the Guadalmedina can be a great opportunity, as if properly designed it can become the most important green space of the city, thanks to its large size, and because at the same time it acts as a means for the continuation of the territorial context renaturalized within the urban space of the city. Among the various benefits that a spatial redefinition of this kind would have on the city, such as those from the point of view of climate or quality of public space, there are, specifically, those related to biodiversity. In a tormented context like the Málaga's one, protagonist not only of natural disasters but also of sores that have affected some plant species including the vines, the presence of an ecological corridor able to accommodate a mixture of plant species in a more controlled environment than the rural one and, consequently, able to recreate a passage for the animal species living in that ecosystem is, in fact, of extreme importance for the city.

1. J. Á. Carrera Morales, *La repoblación forestal de la cuenca del Guadalmedina, en defensa de la ciudad de Málaga*, in *Péndulo nº 12*, 1997, pp. 30

In practice, this process of transformation of space can take place through the creation of a so-called "third space", not totally natural and not entirely urban,[2] that condenses within it some of the characteristics of each other and that restores, at least in part, the balance between city and environment lost almost entirely in the last century. Designed according to these principles, the Guadalmedina becomes a green infrastructure, identifiable as the natural evolution of the grey ones developed in the twentieth century and that, like them, represents the cultural characteristics of the era in which it was conceived, designing the new forms of urban living. Motorways and airports are thus replaced by public transport and soft mobility routes. In addition, unlike in the twentieth century, in which it was of a single-function type, the new green infrastructure is hybrid, also including activities other than being a simple transit space.[3] An example of an infrastructure of this type is given by *Ponte Vecchio*, keeping open the comparison with the most important Italian cities. Although designed several centuries ago, in fact, the most famous bridge of Florence is a perfect combination of an important axis of mobility, in this case pedestrian, and a side function, namely the commercial one in this case.

2. S. Sassen, *A Third Space: Neither Fully Urban nor Fully of the Biosphere*, in J. Graham, C. Blanchfield, A. Anderson, J. Carver, J. Moore, *Climates: Architecture and the Planetary Imaginary*, Lars Müller, 2016, p. 172-179

3. M. Weiss, M. Manfredi, *Evolutionary infrastructure*, in J. Graham, C. Blanchfield, A. Anderson, J. Carver, J. Moore, *Climates: Architecture and the Planetary Imaginary*, Lars Müller, 2016, p. 151

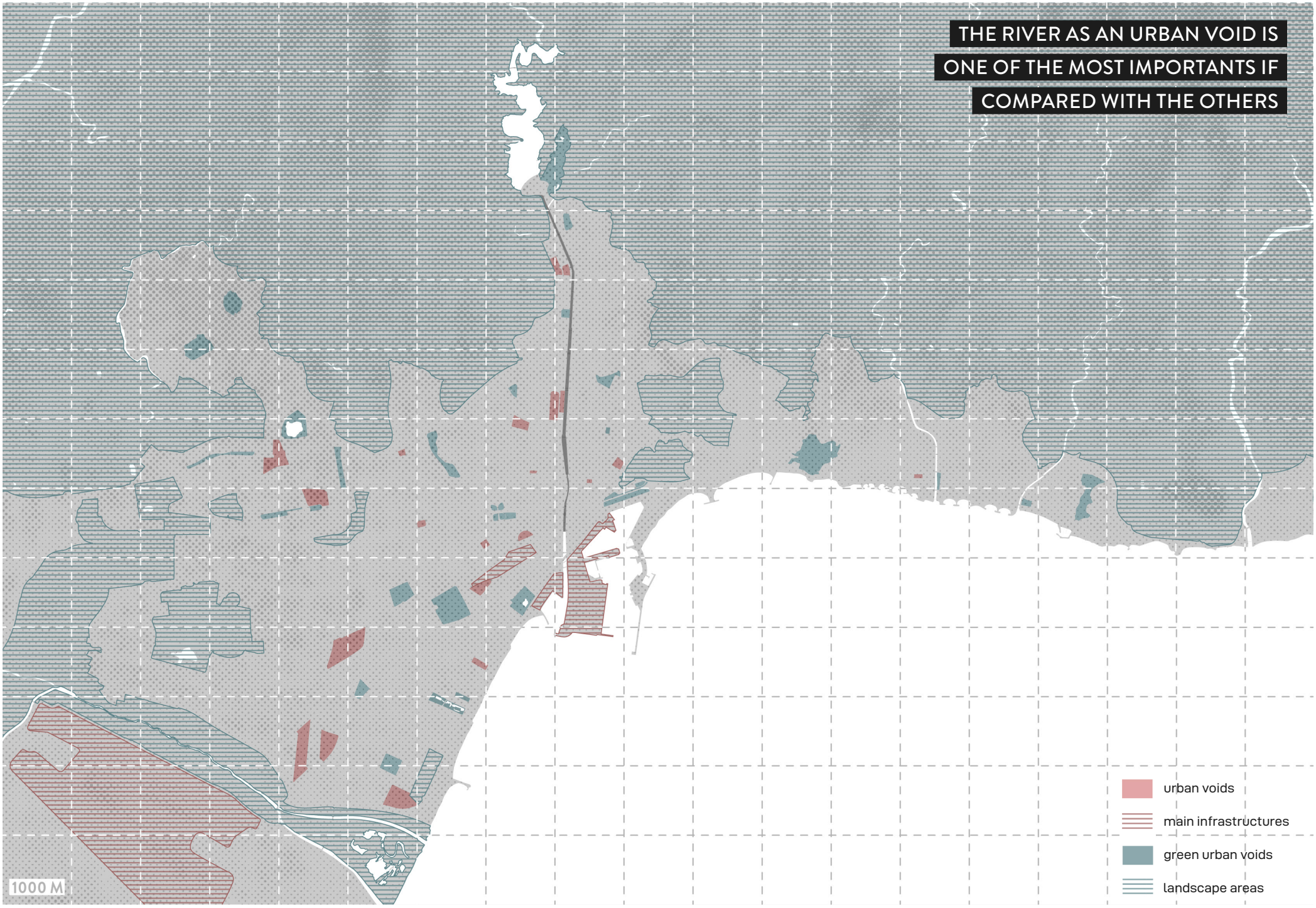

BLUETHROAT
COMMON KINGFISHER
KENTISH PLOVER
LITTLE BITTERN
WHITE-HEADED DUCK
NORTHERN GANNET
BLACK-WINGED STILT
AUDOUIN'S GUL
THE RIVER AS AN ECOLOGICAL CORRIDOR RECREATES A FAVOURABLE ECOSYSTEM FOR NUMEROUS ANIMAL SPECIES

VOID OPPORTUNITY

A second possible reading of the Guadalmedina is that of the riverbed as an urban void. Although its longinile shape is mostly developed in one direction, in fact, it has such an extent that it is also relevant as a surface, and is not just like an axis. Compared to the other major urban voids in Málaga, it is evident that from a dimensional point of view the riverbed is by far the most important one. At the same time, its position and the ability to get in touch with different parts of the city make it even more a space strongly linked to the dynamics of the city. In a historical moment that sees, within the architectural and urban landscape, an overcoming of the tendency towards voids leading to their filling, not only of buildings but also of different specific functions,[1] and a rediscovery of their value and the opportunities linked to them, it is evident how this kind of space can have a considerable potential.

For this reason, despite the current policies that, although having received numerous proposals, even of quality, during the 2012 competition,

1. B. Secchi, *Un problema urbano: l'occasione dei vuoti (Il vuoto)*, in *Casabella n. 503*, 1984

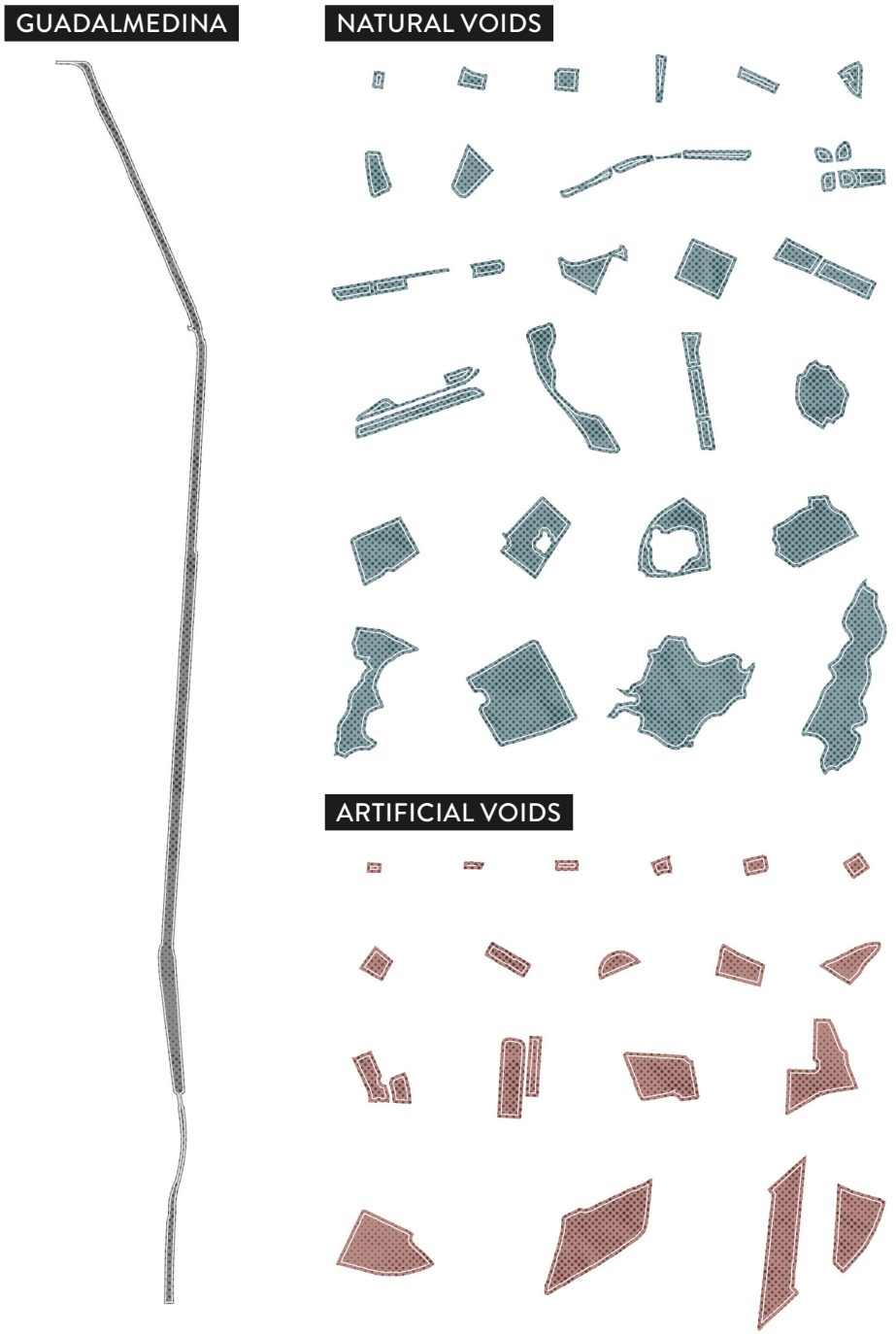

THE RIVER AS AN URBAN VOID IS
ONE OF THE MOST IMPORTANTS IF
COMPARED WITH THE OTHERS
urban voids
main infrastructures
green urban voids
landscape areas
1000 M

have decided not to make any because they are willing to find a way to fill the void and make it a space equal to those that accompany it, the absence of built and any other object within the Guadalmedina, as well as in the very absence of design, must be identified as a quality rather than a limit, and so preserved. On the other hand, the emptiness represents one of the most important constants of its history for the Guadalmedina and, since the river itself is an important symbol of Málaga, also of that of the city. In the following chapter, the void is treated in all its facets, in order to fully understand it and identify ways in which it is possible to imagine a design scenario that enhances it.

FIG. 1 Size comparison of Málaga's main voids. The Guadalmedina River as a void dominates over the others.

"A complex and changeable space that becomes empty to our eyes not for lack of uses or for an actual physical absence, but for an inability to mean it as a non-productive space."

Mario Casciu, *Il vuoto (urbano)*, in Mario Manieri Elia (edited by) *Topos e Progetto: Il Vuoto*, 1984, p. 26 (own translation)



NATURAL BIGNESS

In his book *Junkspace* Rem Koolhaas dedicates an entire chapter to the concept of *Bigness*.[1] According to the Dutch architect, a bigness is an architecture of extraordinary dimensions, out of the ordinary, that surpassed a certain scale detaches itself from the context in which it rises and dominates it. Given its size, the bigness is no longer an architectural object within a city, but an element placed on its own level and able, therefore, to redefine the spatial characteristics of an entire territory. When it comes to bigness, according to Koolhaas, the formal and stylistic connotations lose their importance because the size alone is sufficient to define the character of the building.

Given its considerable size, such as to make up a visible portion of the city, the Guadalmedina can be defined as a bigness. Although not an architectural element, the river can be considered in the same way as the large buildings described

1. R. Koolhaas, *Bigness or the problem of large*, in R. Koolhaas, *Junkspace. Per un ripensamento radicale dello spazio urbano*, Quodlibet, 2006

by Koolhaas. This is because, in the first place, the bed of the Guadalmedina undoubtedly constitutes the largest urban void of the city; given its river origin and especially because of the climate events that have not allowed, over the years, its filling, in fact, it differs from all other voids such as parks or squares in size but also in its ability to influence the environment that surrounds it, given its linear morphology that allows it to come into contact with different parts of the city. Secondly, then, the river can be considered a bigness in relation to its importance, as an urban space but also as a symbol of the city, which still has for the citizens. Although it has never been, even before the projects of revolution of its forms, a particularly rich river and it now presents itself as a long abandoned urban space and in a state of decay, in fact, the Guadalmedina River remains the focus of attention and visions for the Málaga of the future. This characteristic, more than to a sense of gratitude, linked to the fact that the city itself arose along its shores, can be attributed, in the perspective of this analysis, to its size. In keeping with what Koolhaas said, the river, surpassing the typical scale of public spaces and urban voids in general, has in fact become an entity defined by its size only. And then it doesn't matter if a large part of its stretch is surrounded by tons of concrete, or if neglect has led it to be literally invaded, in some parts, by the infesting vegetation; the river is and will always remain an element of great importance for the city.

POSSIBILITIES OF AN EMPTY SPACE

If on the one hand it is true that the Guadalmedina is an urban void, and moreover one of the most important within the Málaga's landscape, on the other it must be admitted that its management involves a whole series of criticalities. It is not by chance, as already explained in a previous chapter, that the river is, to date, almost identical to what it was centuries ago, remaining unchanged despite the constant need for a redefinition because of the difficulty in intervening on it. For this reason, although the river is a space with enormous spatial potential, it does not appear, at present, as a public space in the strict sense of the term. The activities that can be carried out there, in fact, are currently extremely limited by the support structures that can be foreseen inside and by the difficulty of managing such a dynamic and changing space. Wanting to imagine design scenarios aimed at identifying a public space in all respects it is therefore necessary to recognize its limits, accepting the fact that it will

never be able to assume the forms or functions that typically distinguish the spaces of the public sphere of the city and imagining different ways in which it is possible to live its spaces.

Looking at the past and the ways in which people have interacted with the river over time, it is easy to understand that all the functions that have taken place over the centuries have had as a common factor the lack of structures or elements that define a specific use, namely born from the absence of design of its spaces. Since it could not accommodate specific functions, the river has supported a series of spontaneous activities, the result of the appropriation of urban space by citizens; therefore it result in the ephemeral the key to reading the Guadalmedina as a public space. This characteristic, although it may seem a simple response to a critical issue, can in fact be read, to date, as an important quality of this place. Overturning the point of view, the need (or will) not to provide specific functions for the bed of Guadalmedina can be interpreted as a way to give life to different urban situations, especially at a time in history when climate change has highlighted how nothing, within a city, is immutable over time and consequently how much planning in a perspective of flexibility and adaptation to continuous changes is fundamental. Consequently, any project thinked for the bed of Guadalmedina cannot fail to take into account this peculiarity, supporting as far as possible the

ephemeral character of the programmes that the river can host and preserving its void character. On the other hand, looking back over the centuries, there has been no lack of virtuous examples in which the void was valued this much. One of these is undoubtedly the *Agora* of Athens: it was the nerve centre of the political life of the Greek capital, as well as of the sphere of social relations between people and of city trade. Despite being surrounded by important institutional buildings and numerous temples dedicated to the gods, the Agora was the real fulcrum of the city, so that the Romans, once conquered the city, in order to deny the memory of the place chose to build in the center of the square, rather than destroying the surrounding buildings.[1] At the same way, the void constituted by the Guadalmedina assumes a great importance, passing from being a simple opposition to the built space to becoming the protagonist in a redefinition project so important for the city.

1. M. Casciu, *Il vuoto (urbano)*, in M. Manieri Elia (edited by), *Topos e Progetto: Il Vuoto*, Gangemi Editore, 2008, pp. 24-25

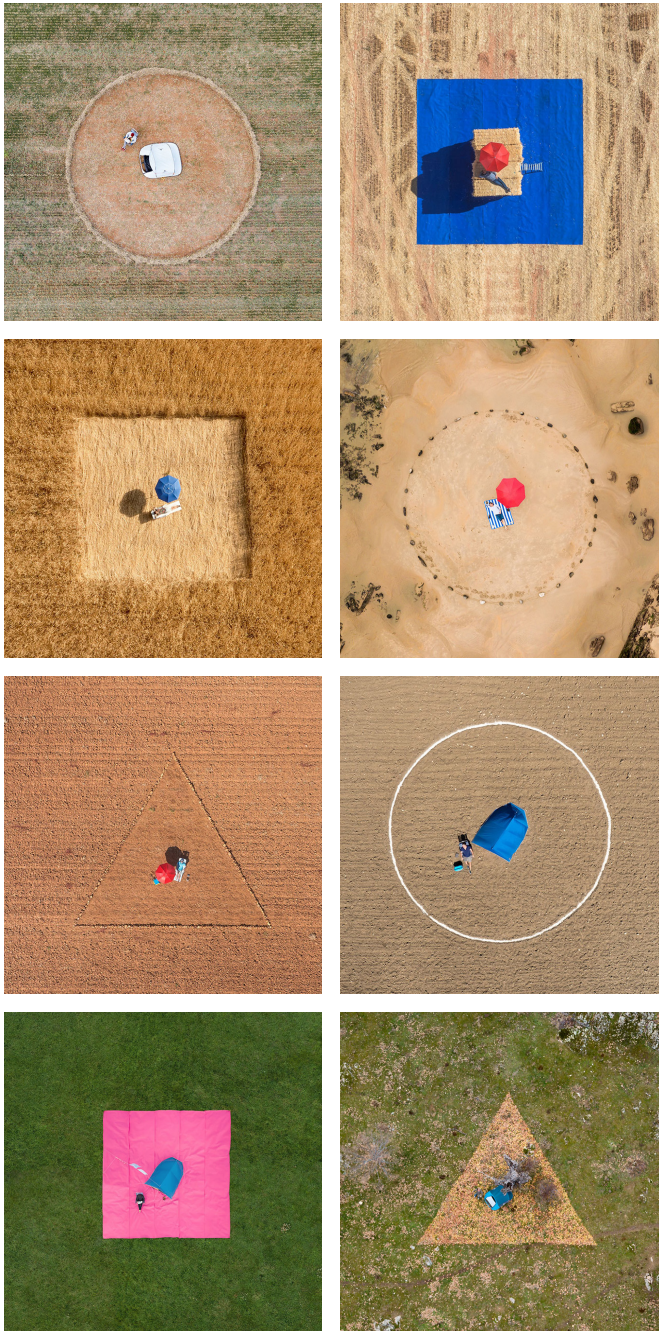
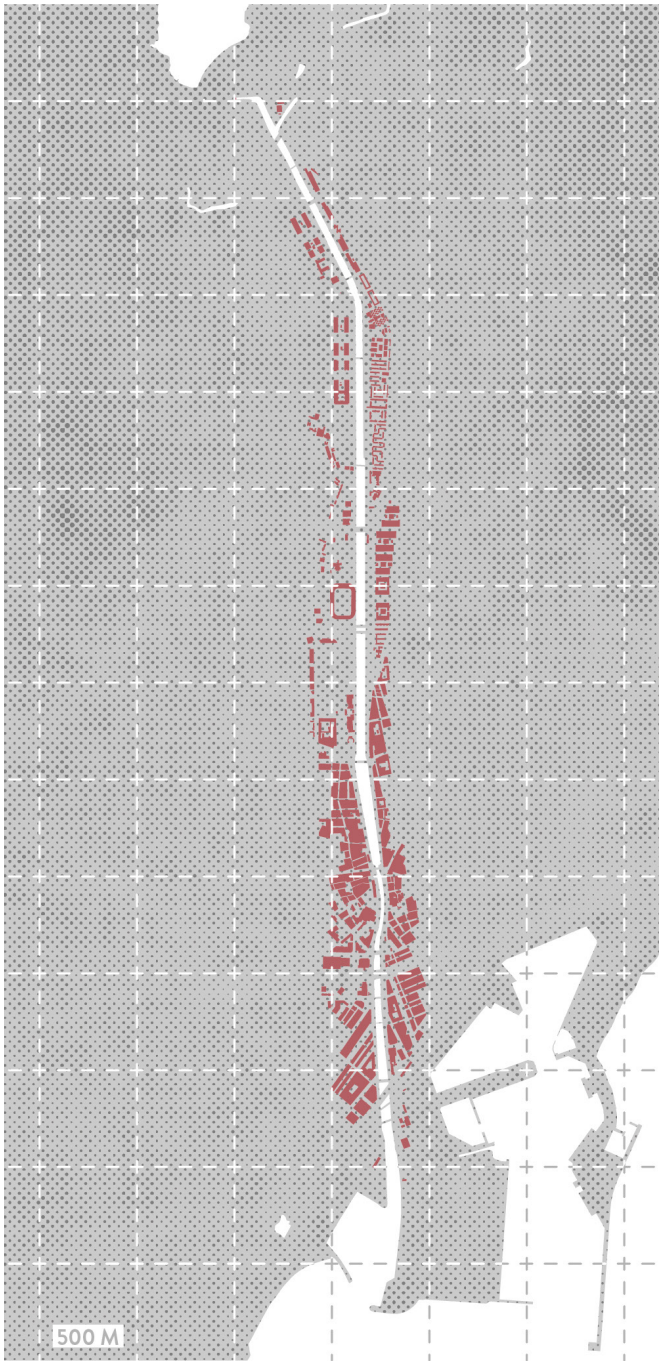


FIG. 1-8 Rubén Martín de Lucas, *Minimal Republics*, 2015. The artist occupies pieces of land and transforms them into ephemeral microstates of 100sqm, which he then inhabits for 24 hours.

A PROJECT IN THE RESONANCE

Once the river is fully understood as a flexible public space, it is natural to wonder how a project that is limited only to the redefinition of the soil and the creation of supports for spontaneous activities can act as a reactivation of such a large portion of the city. Given the lack of well-designed services and public spaces in the northern areas, in fact, it is necessary to provide certain elements or functions to act as attractors, able to generate new polarities along the course of the Guadalmedina and motivate the definition of new flows of people in this direction. Consequently, it is clear that the redesign of the river axis alone cannot be a viable solution. On the contrary, it is necessary to establish a link between the spaces of the river and those of the city with which it comes into contact, proposing a redefinition project that involves both in a synergic relationship of mutual benefit. It is only by broadening the scope of the project, in fact, that the Guadalmedina can be a starting point for the

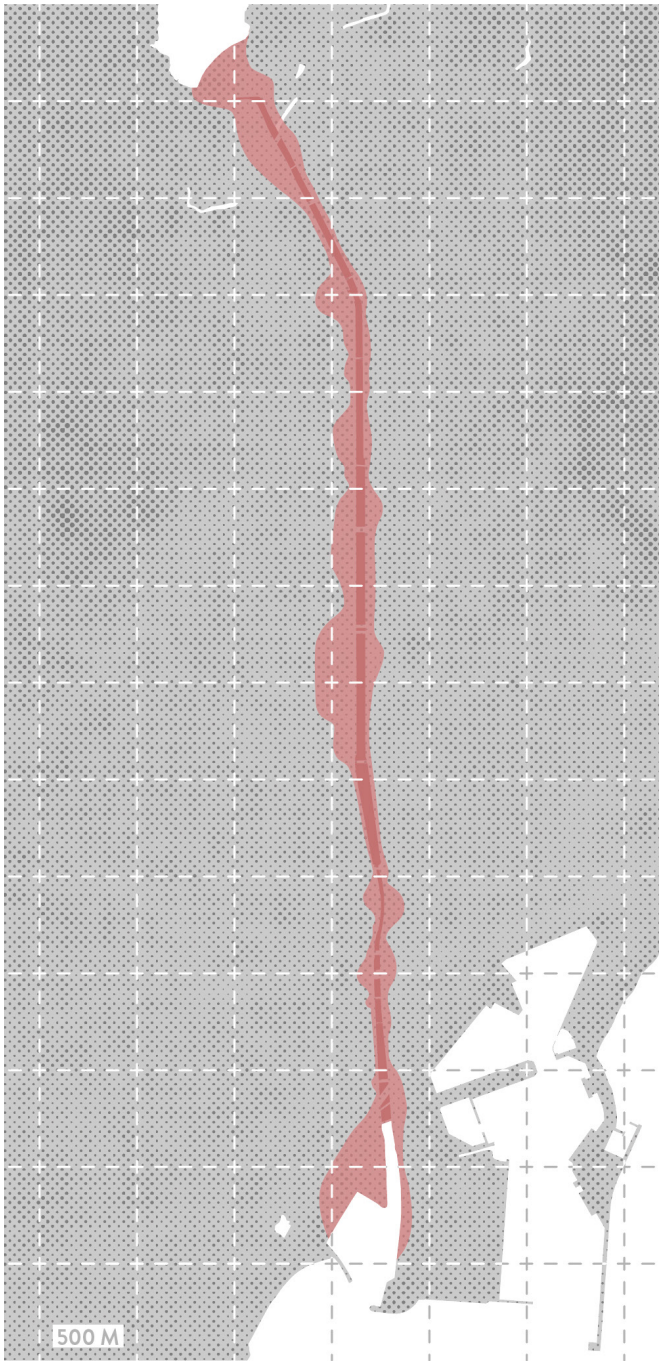
GRADIENT OF BUILT
ALONG THE RIVER



rethinking of the urban space of Málaga, adding to its qualities as an infrastructure and empty space to the urban scale those of areas where it is possible to think new buildings and open spaces with more specific and durable functions.

The project thus conceived then develops from the river and its "resonance", from that part of urban space in which it, in a perspective of compression and expansion, leaves its borders and becomes one with the city. Starting from an analysis of the built along the river which, as already seen, tends to become increasingly sparse and less dense moving northwards, it is in fact possible to identify in negative an area, consisting of the sum of voids that are in close contact with the river, that can become, within the framework of the project, one with the Guadalmedina and eliminate that border between river and city that today on the contrary appears evident.

THE RESONANCE
AREA OF THE RIVER



A CLIMATE DEVICE

In one last reading, the Guadalmedina River can be seen as a device. The latter is defined, taking the words of Michel Foucault, as *"an element that, at some point in history, was built in order to respond to a specific need"*.[1] In the case of the river of Málaga, the need in question is that of a climate nature, linked not only to the phenomena of flooding which, as we have seen, have always affected its history, but also to the question of global warming and its effects. In relation to these environmental phenomena, in fact, the river is an element able to address them, mitigating their effects and acting as a lifeline for the large portions of urban space that overlook. In addition to serving as a large reservoir for the accumulation of meteoric water, in fact, it contributes with its surfaces to decrease, in some sections, surface temperatures.

Looking to the past, it is easy to see how the use of these devices, which can be defined as climatic, is well rooted in the architectural culture as it developed centuries ago. The design of

1. Giorgio Agamben, *Che cos'è un dispositivo?*, Nottetempo, 2006 (own translation)

buildings and cities in relation to environmental characteristics has, in fact, always been present in those areas characterized by extreme climatic conditions. The wind towers, built in arid areas in order to convey and exploit the winds, are an example of this type of architecture conceived centuries ago in relation to modify, in a passive way, the bioclimatic conditions, in synergy with the surrounding environment.[2] Analizing the capacities of these climate devices used in the past centuries it is possible, nowdays, to understand how cities can be adapted to the changing climate, which led some territories that until shortly before enjoyed favourable climatic conditions to have the need to mitigate the new environmental effects. At the same way, the study of the spatial and material characteristics that led the river to act unknowingly as a climate device and to influence the microclimate of its surroundings is important, as the Guadalmedina can be a model to follow when defining new public spaces capacities. Although these can not affect the climate characteristics of the city as the river, in fact, they can still share its objectives and go to integrate the action of the river acting on different climate agents, generating with it a strong synergy.

2. M. Grosso, F. Butera, G. Scudo, E. Parisi, M. Perin-Bert, *Il raffrescamento passivo degli edifici. Concetti, precedenti architettonici, criteri progettuali, metodi di calcolo*, Maggioli, Rimini 1997, pp. 174-191



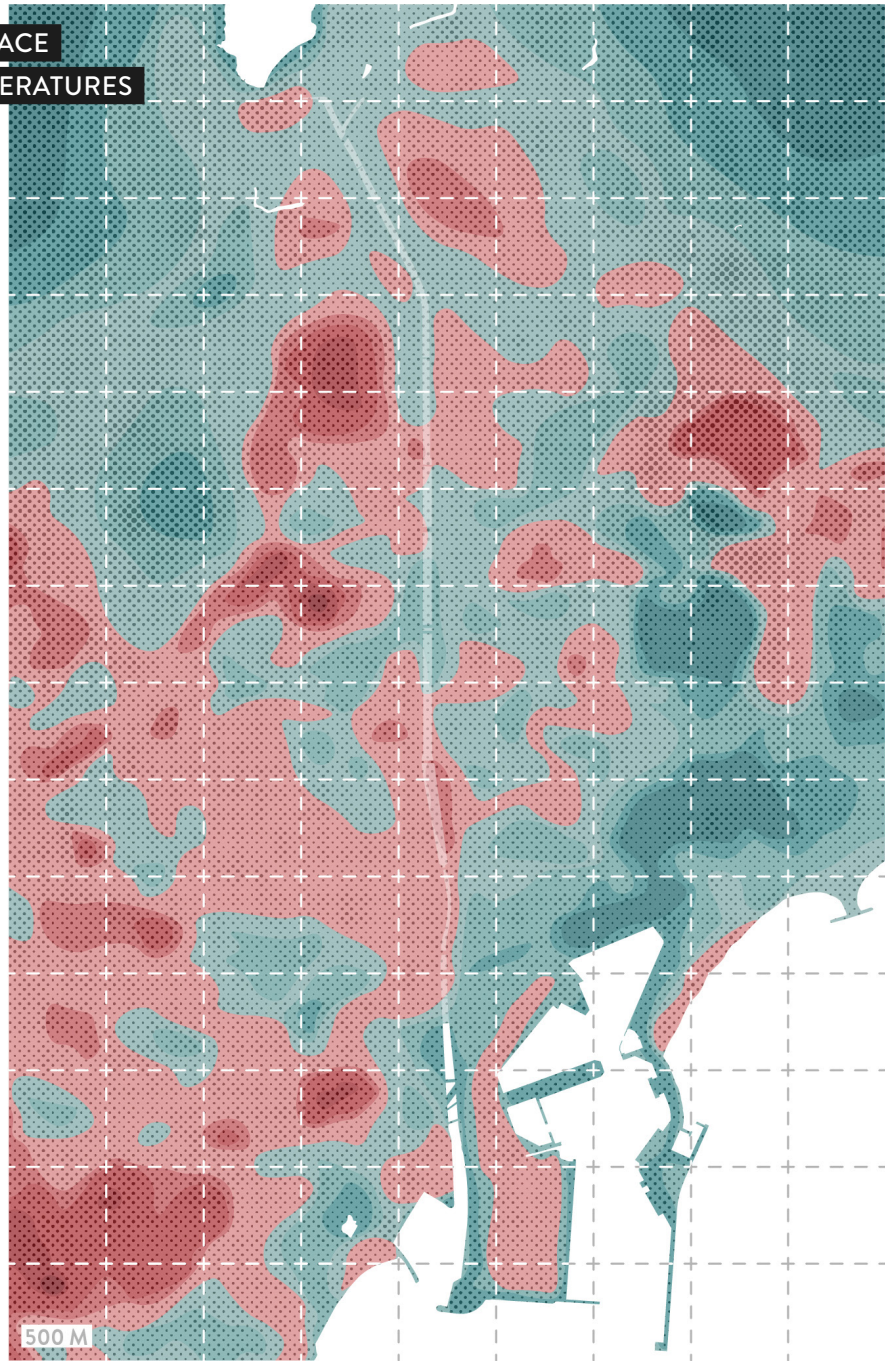
FIG. 1 Wind towers in the iranian city of Yazd.

INFLUENCES

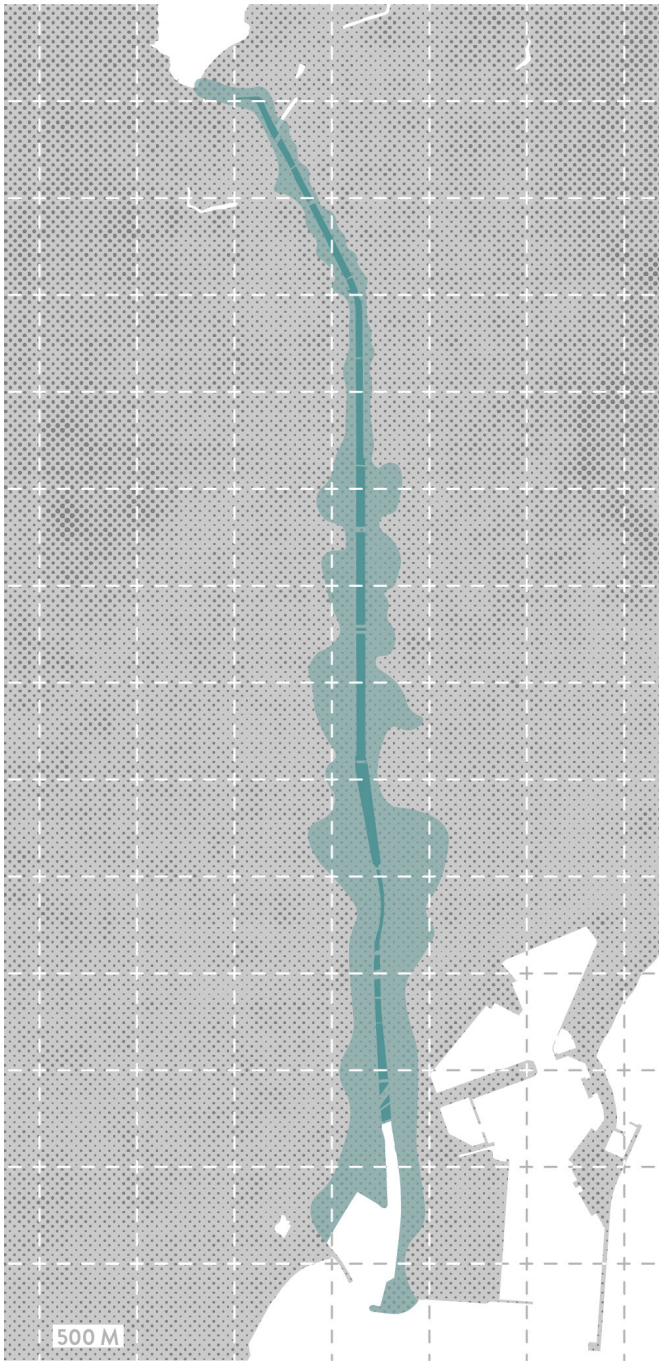
The Guadalmedina River, if studied from the point of view of its relationship with climate phenomena, is paradoxically both a source of environmental criticality and an element of protection of the city from the effects of the latter. Using the lexicon learned in the previous chapter, it is both a catalyst of environmental events and a climate device that can mitigate their effects. Leaving aside for a moment the differentiation between these two diametrically opposed types of effects that the Guadalmedina has on the urban space of Málaga, it is possible to dwell on the concept that underlies this relationship between river and city, or the fact that the river, for better or worse, is able to influence the characteristics of the context in which it fits. These are not only spatial and morphological, as seen in the previous chapters, but also related to the climate. It is clear, in fact, that given its size and its position, that puts it in contact with many parts of the urban space of Málaga, the Guadalmedina has a great influence

on the city, generating a microclimate different from that of the areas that do not face it. Looking first of all at the map of the average annual surface temperatures it is possible to notice, in fact, that these significantly change in the areas near to the Guadalmedina, arriving at an increase or a decrease in the order of 3/4 degrees. In particular, it is interesting that, as shown by the map, the stretches of the river in which there is a major artificial component, consisting mainly of concrete, affect the portions of neighboring cities by increasing the surface temperature while while, on the contrary, those that are mostly covered by a vegetable coat have the opposite effect, cooling the environment. This remarkable difference in the impact that the various parts of the river have on the city are in fact an indication of how a simple ridefinition of the surfaces can dramatically change the bioclimate situation. Observing, instead, the map of vulnerability to the phenomena of flooding of urban space it is possible to realize that, in the same way as the temperatures, these affect particularly the more artificialized areas, symptom of how a portion of the most natural riverbed is able to counter these climate events better than any wall or embankment that is possible to build.

SURFACE TEMPERATURES



HIGH FLOODING RISK AREAS



26°C
28°C
30°C
32°C
34°C
36°C
38°C
40°C

ORDINARY / EXTRAORDINARY

When it comes to climate change, the tones often assume a catastrophic connotation, putting in the foreground those highly destructive events that are its direct consequence and constitute the easiest way to identify the problem. Phenomena such as floodings or forest fires are in fact the most obvious form of manifestation of the climate shift and were, for this reason, the first to be studied. By diverting attention from these catastrophic tones, however, it is possible to identify a whole series of other environmental phenomena which are equally linked to climate change but, instead of materialising into single, large-scale events, involve a slow though equally substantial change in the climate characteristics of a place. These, while generating critical issues in relation to urban spaces and situations of discomfort for citizens in the same way of the others, are more difficult to read because they are often invisible to a first analysis or otherwise are not immediately connectable to climate change.

In the case of Guadalmedina, this relationship between ordinary and extraordinary in its climate connotations is particularly evident. The numerous floods that have occurred in recent centuries are the exceptional component. Although these have been repeated several times with an almost regular frequency and may therefore seem an ordinary event, in fact, given their disastrous impact on the city and the people concentrated in a relatively short period of time, they can be defined as extraordinary events. These have completely catalyzed the attention of the public over time and for this reason a whole series of other less visible climate factors has been completely ignored. Among these effects, which can be defined as ordinary, the increase in temperatures is certainly the most significant, but not the only one. Phenomena such as the reduction of the number of rainy days, as well as the serious loss of biodiversity of the areas around the river, in fact, have played a leading role in generating the urban landscape that today identifies the Guadalmedina, as well as flood events. It is therefore necessary to start from the awareness that climate change has different facets, which are constantly changing, wanting to go beyond the projects that in the past have acted only to adapt the city to flooding and define a proposal that can in practice create safe spaces and with a high climate comfort.

CREDITS

pp. 188-189 / Map of the river as a doble re-connection: infrastructural and natural. Source: personal drawing

pp. 192-193 / Map of the river as an infrastructure. Source: personal drawing

pp. 198-199 / Map of the river as nature. Source: personal drawing

pp. 202-203 / The river as an ecological corridor for plant and animal species. Photo: personal

pp. 206-207 / The river as an exceptional void within the Málaga's urban panorama. Source: personal drawing

p. 209 / Size comparison of Málaga's main voids. The Guadalmedina River as a void dominates over the others. Source: personal drawing

p. 215 / Rubén Martín de Lucas, *Minimal Republics*, 2015. The artist occupies pieces of land and transforms them into ephemeral microstates of 100sqm, which he then inhabits for 24 hours.

p. 217 / Built gradient between the North and the South of Málaga's urban space. The urban fabric becomes thinner as you move north. Source: personal drawing

p. 219 / The resonance of the river. The selected area represent the river in relation with the main neighbouring voids which can be involved in the design process. Source: personal drawing

p. 223 / Wind towers in the iranian city of Yazd. Photo: Earth Science Australia

pp. 226-227 / Map of the average summer surface temperature in Málaga's urban space (on the left). Map of the most vulnerable areas in relation to flood events in Málaga's riverside (on the right). Source: *www.greenurbandata.com*

05

ESTRATOS ACTIVOS

THE CENTER OUT OF THE CENTER

In order to give credibility to the analysis and design considerations developed so far, showing how new public spaces in the area around the Guadalmedina can actually conform to the reflections made from the climate point of view, this dissertation ends with the study of one of the possible design scenarios that open along the river. In particular, the project concerns an area within *Martiricos*, a relatively small Málaga's district located in the middle of the urban stretch of the Guadalmedina and therefore destined to become the new "center outside the center". Given its position, central to the course of the river and a short walk from the historic center of the city, and its dimensional characteristics, in fact, it stands as a nerve point in the project of the Guadalmedina basin. The system of voids identified within the Martiricos district fits into a context dominated by large buildings, both public and residential, different from the more central parts of cities. Some of these, especially those for residential use, are the emblem of the part of Málaga designed according to the principles

of urbanization and are therefore similar to each other and devoid of formal features worthy of note; others, however, are pleasant exceptions. In addition to the stadium, which rises in size compared to the rest of the city, there are in fact some centers linked to culture and several schools, including some virtuos examples of modernist buildings typical of Málaga's architecture.

In this particular context within the city of Málaga, today there is already a part of a project that will enrich a student residence, two towers used as housing and a shopping center. The project developed within the framework of this thesis is therefore a possible alternative. Without dwelling on the quality or the critical aspects of the project that has already been carried out to date, in fact, the project proposed here aims to identify a parallel route in which the river, currently not affected by the development process of the area, is integrated into the dynamics of this part of the city and where climate considerations are at the basis of the design of the new urban space.



The following photos gives an idea of the Martiricos district's urban landscape showing its most interesting buildings.



THE TALL SPLINT BUILDINGS THAT DEFINE THE WEST EDGE OF THE MARTIRICOS DISTRICT SEEM LIKE A SCENIC BACKDROP FOR THE NEW PROJECT OF THE PUBLIC SPACE


SUR






P3
P3



THE RIVERSIDE ARCHIPELAGO

The choice of the area of Martiricos as a case study within this research lays its foundation in the identification of that network of strategic spaces that open along the river and that can then define opportunities for projects in synergy with it. Starting from the definition of the resonance spaces of the Guadalmedina, in fact, it is possible, entering more in detail, to define a system of urban voids that, each with different formal and dimensional characteristics and inserted in different contexts within the Málaga's landscape, relate differently with the river offering multiples opportunities of redefining urban space. The city thus designed is, therefore, a combination of the theory of the linear city, since the fulcrum of the project is the Guadalmedina that acts as an infrastructure axis able to trigger processes of rethinking urban space, and the most contemporary conception of the city as an *archipelago*. The latter, protagonist of several writings and repeated several times

by different designers, is in fact based on the definition of a series of spaces that, unlike an urban plan that deals in a general way with the whole urban environment of a city or part of it, act as exceptions within the urban fabric,[1] defining itself through the identification and enhancement of pre-existing characteristics and qualities and through a positive conflict between the parts.

As mentioned above, buildings along the course of the Guadalmedina have a tendency to become increasingly less dense and finally to dissolve completely as moving north. As a result, the gaps that can be identified are generally wider in the northern part. On the other hand, the voids in the southern part are better placed within the Málaga's urban context, entering the most dense area of services and infrastructure to support public life. Among all these identified voids there are three that are particularly interesting because, thanks to their spatial characteristics and the relationship with the context that surrounds them, are exceptions able to redifine the way to live in relation to the river. Since they are located at different points of the Guadalmedina urban route, these voids are the representation of the three sections of the river identified, bringing out the different design opportunities in relation to the different characteristics of the riverbed.

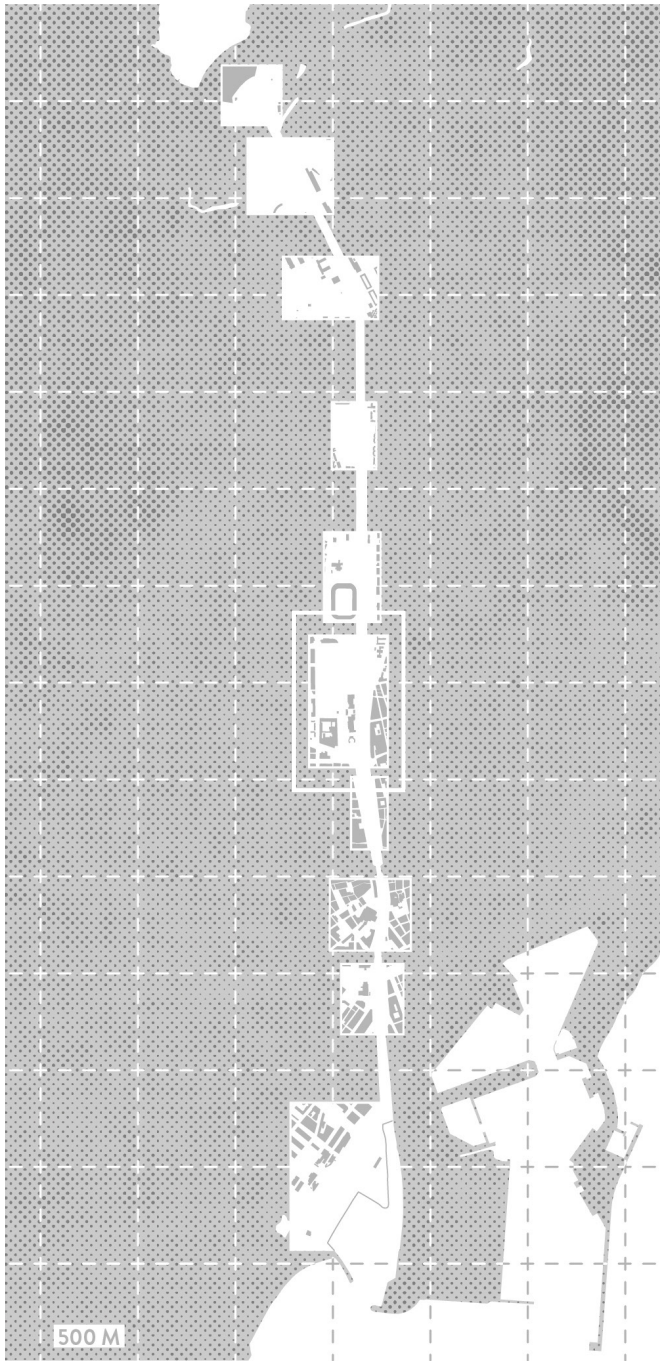
The first of these voids, located within the *El Bulto* district in the southern end of the city,

1. F. Indovina, *Dalla città diffusa all'arcipelago metropolitano*, FrancoAngeli Editore , 2009, pp. 190-193

fits fully into the context of the port of Málaga. Mainly overlooking the sea, or the river that in this section has a large volume of water inside, this space is an opportunity to rethink the southern edge of the city, imagining ways in which the mainland can relate to the sea also in relation to issues such as rising tides. Thanks to its size, it also contains the potential to create a large public space out of scale compared to the others in the historic center, or in general along the coast line, as well as giving back to the citizens a part of that coastal area that today is monopolized, even if disused, by the port activity.

Moving from one extreme to the other, instead, in the northern part it is possible to find a large urban void within the *Las Virreinas* district. The latter is the result of one of the last expansions of the city, the northernmost one closer to the Limonero Dam, and therefore in a peripheral context, characterized by the presence of similar buildings and geometrically positioned along the river. Consequently, also the urban void, placed in the middle of these blocks, has a regular morphology and stands on the point where the river changes direction starting its long straight line. Being located in a part of the city close to dissolve in the landscape context, finally, the void of Las Virreinas is in direct contact with the vast expanses of natural land surrounding the city, creating design opportunities that go beyond the urban environment of Málaga.

THE ARCHIPELAGO
OF RIVERSIDE VOIDS



Finally, the last void is in the central part of the river track, inside the *Martiricos* district. In this specific case, talking about a single urban void is not correct, because that of Martiricos is rather a system of several empty spaces that are extremely linked to each other. These, in addition to being in a decidedly favorable position within the city, connected both to the historic center and the territorial context to the north and placed at the center of the new important axis defined by the river Guadalmedina, condense the best qualities of the two urban extremes and presenting on the one hand a high degree of porosity and on the other the presence of different services and public buildings. Summing up the most characteristic features of the parts of the city that have a strong relationship with the Guadalmedina, the latter system of urban voids is therefore the one chosen to deepen a project scenario of the new Málaga riverside as an archipelago.

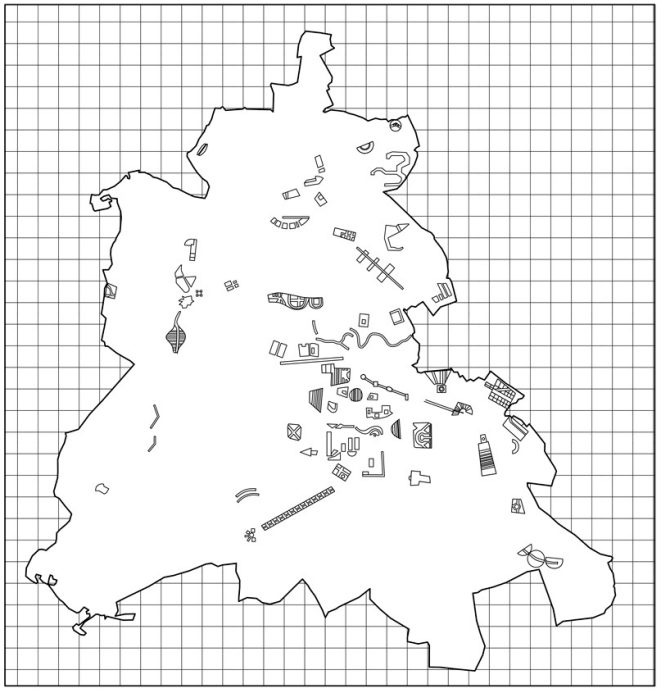
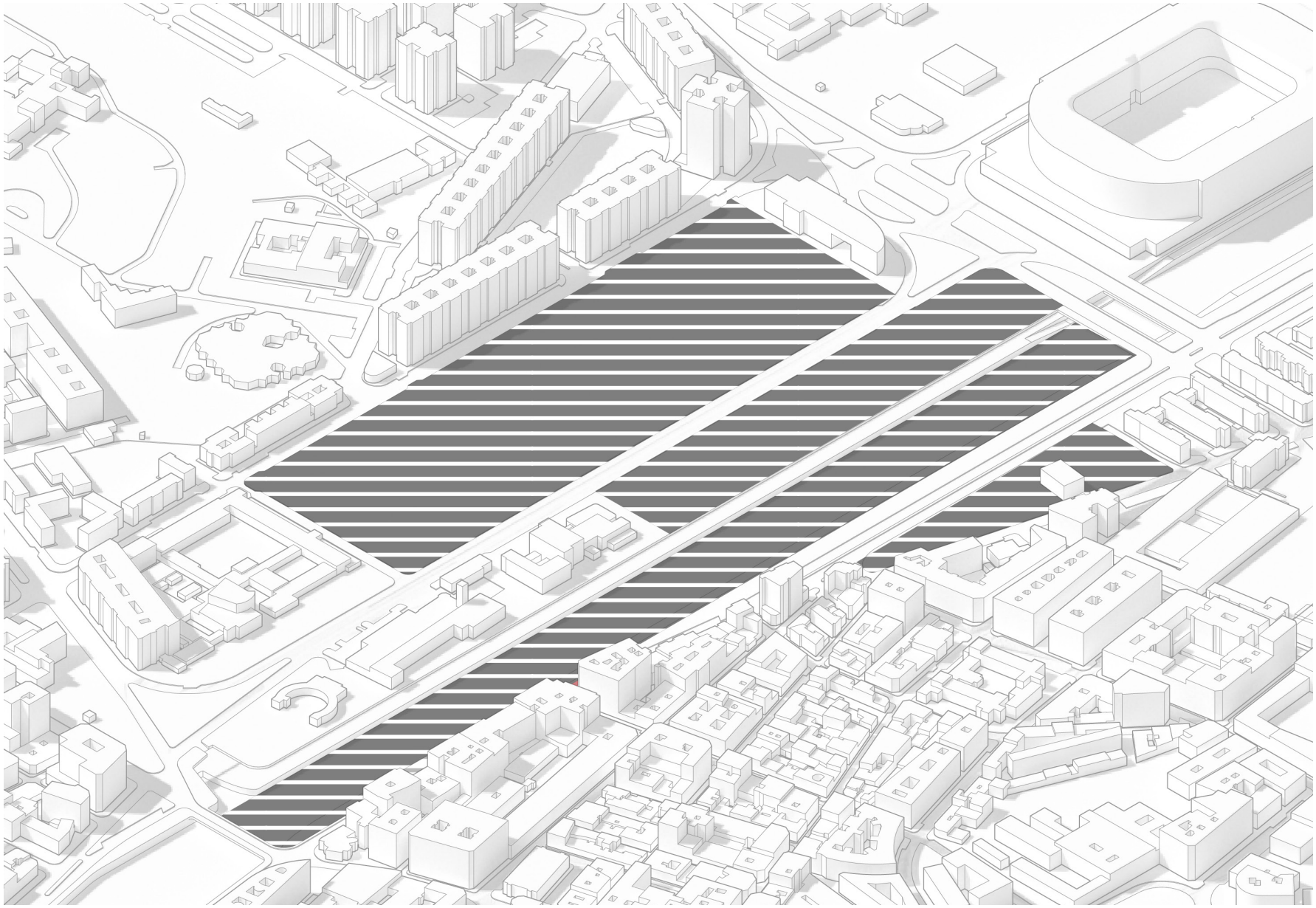


FIG. 1 O. M. Ungers, R. Koolhaas, *Berlin: A Green Archipelago*, 1977. The project is one of the most iconic examples of the idea of city as an archipelago.

THE MARTIRICOS
SYSTEM OF VOIDS



QUALITIES / CRITICALITIES

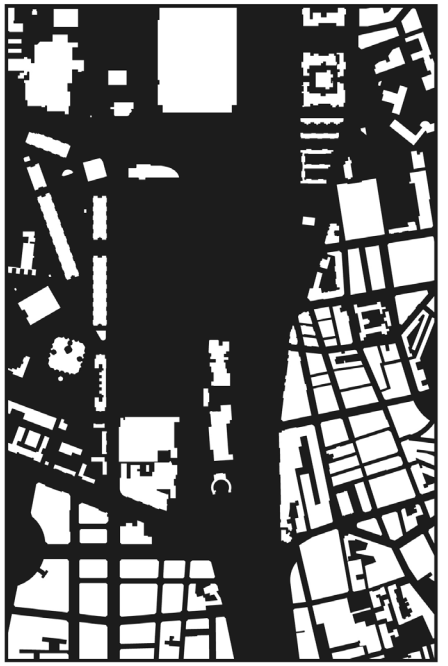
Wanting to contextualize that part of the city that today is identified with the name of Martiricos within the Málaga's landscape, we need to retrace those historical stages that gave life to the characters that can be appreciated crossing its spaces today. The area of the present district of Martiricos became part of the urban landscape of Málaga only in the second half of the twentieth century, while before it was part of the landscape that surround the city or used for agricolture. Designed to house some blocks of residential buildings, a series of public and institutional buildings and a large industrial center, which in more recent times was abandoned and demolished, the neighborhood fits into a part of the city that, despite being outside the historic center, it is very dynamic and well served by services and infrastructure. In this district, in fact, there are important public buildings, such as the *Rosaleda* stadium, while the historic center is easily reachable within a ten minute walk or by bike.

Following the demolition of the industrial complex, however, the neighborhood has become an undefined place, characterized by great urban porosity and devoid of the element that most of all defined its role within the city. At the same time, however, the district without the large building that covered much of its surface, has taken on the characteristics that make it, to date, an opportunity for a new urban scale project. The system of voids identified as the basis of the project, in fact, in addition to the river, a small park and the parking lots that serves the stadium, also includes the area that previously housed the industrial complex, which is the most important vacuum by the dimensional point of view. These voids, as previously mentioned, have different qualities, including their regular shape that follows the transversal morphology of the Guadalmedina, entering into a strong relationship with it, as well as their large size. Despite this, they are also characterized by a series of criticalities and needs that make them poorly integrated into the dynamics of that portion of the city. First of all, its urban porosity: if on the one hand it is true, in fact, that the open spaces inside the neighborhood are many, it is easy to notice, analyzing the property regimes, that most of them are for private use and therefore not accessible to everyone. Looking then at the forms of the city in this portion it is easy to understand how a second level of criticality is given by the lack of qualification of the soil,

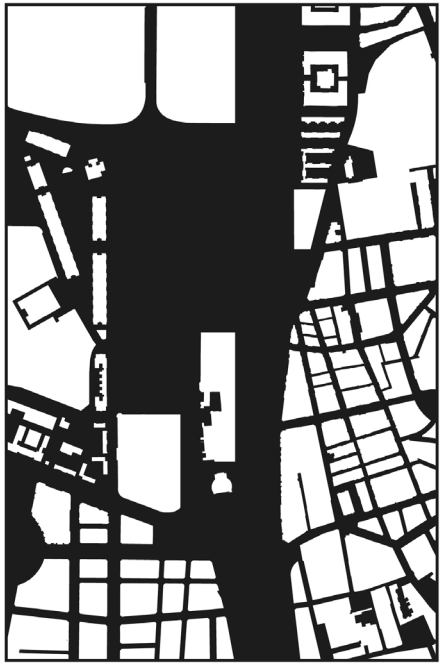
which, more often than not, is resolved with large expanses not better defined in concrete or other impermeable materials that, besides being a source of climate issues such as the formation of islands of heat, make them difficult to be lived.

Taking these factors into account, as well as the projects proposed for the area over time, especially at the 2012 competition, which highlighted the explicit needs of the city, the solution devised is a large public park. This, understood in its most contemporary sense and inspired by projects such as the *Parc de la Villette* by OMA in Paris, consists in a series of public spaces different from each other, green and not, which are juxtaposed and in which a sequence of different urban situations is generated.[1] The project, therefore, maintains the presence of a large continuous void that contrasts with the nearby parts of cities characterized by a dense fabric, starting from the desire to preserve the qualities that are already present in the lot.

1. C. Waldheim, *Landscape as Urbanism*, in C. Waldheim, J. Irving, *The Landscape Urbanism Reader*, Princeton Architectural Press, 2006, p. 40



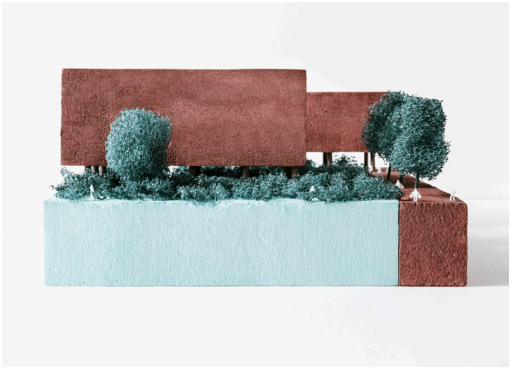
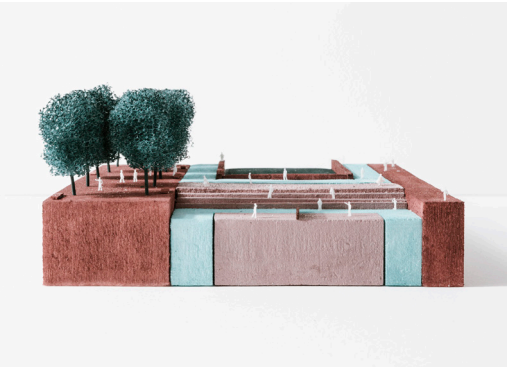
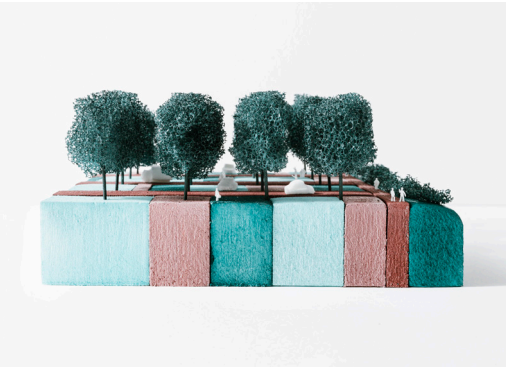
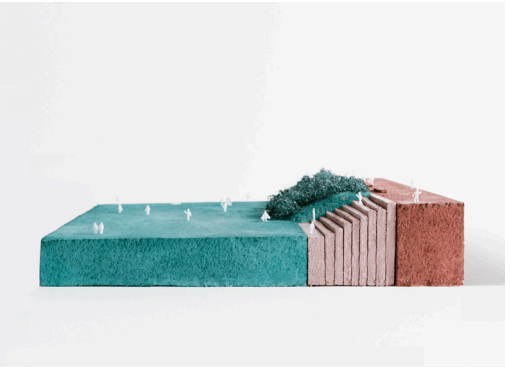
UNBUILT
/ BUILT

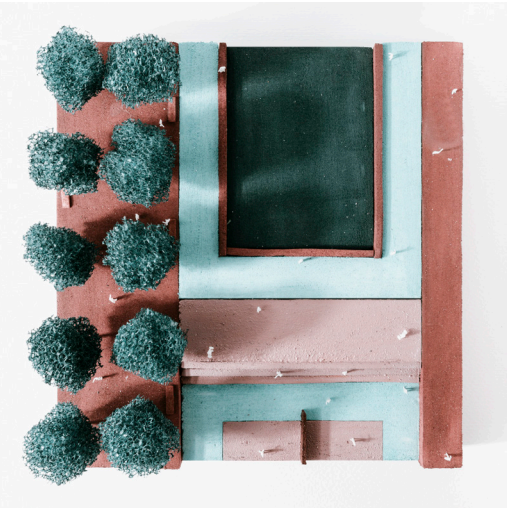
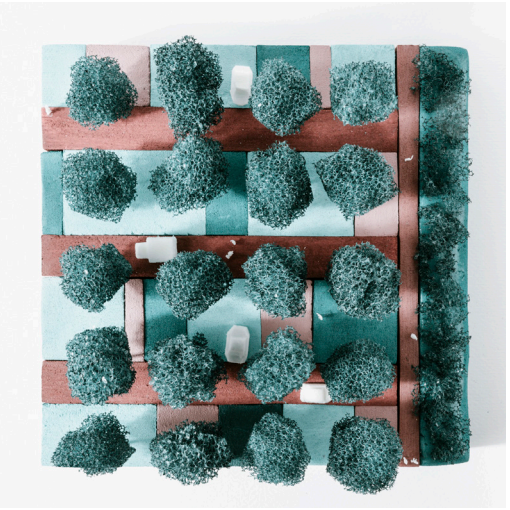


PUBLIC
/ PRIVATE

ACTIVE STRIPS

The project strategy identified for the definition of the new public park has as its objective the enhancement of the relationship between the city and the river, as well as the qualities present in the lot. These are, in fact, enhanced not only spatially, encouraging the displacements between these two spaces, but also from the conceptual point of view. The idea, therefore, was born directly from the previously-made considerations in relation to the Guadalmedina and from the different readings of its qualities, using the river as an inspiration while designing the new public space of Martiricos. *Estratos Activos* is the strategy that is the result of this will, and consists of ideally dividing space into different sectors which, like the Guadalmedina, cross the urban space of Málaga transversally influencing it from the point of view of space use and climate. These layers follow the pre-existing shapes of voids and are, thought different from each other, resulting from specific environmental considerations, linked to the need to mitigate the effects of climate agents, and use of public space.

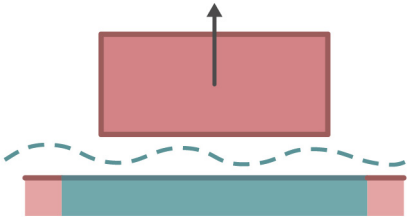





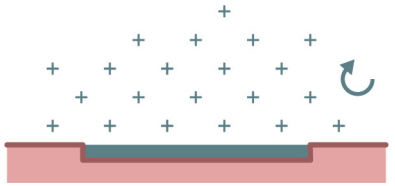

Placed side by side, moreover, they form a strong synergy able to draw a quality urban landscape and ensure a high climate comfort.

On the other hand, the idea of drawing open spaces from the definition of themed strips is not new in the architectural landscape. Taking up the parallelism with Koolhaas' project for the *Parc de la Villette*, for example, we can see how it is defined starting from the division of the space into strips, with a width of 25 metres, which alternate green spaces, areas with a higher and denser plant presence and playgrounds. Also the belgian firm Dogma, in the project for the *Central Park of Prato*, redesigns the space by operating a radical division into bands that alternate surfaces and different functions. Inspired by these projects, therefore, the new space of Martiricos is defined as a sequence of four urban situations, which welcome different functions and enhance, through a positive conflict between the parts, characters and potential that were already present, as well as the relationship with the surrounding city.

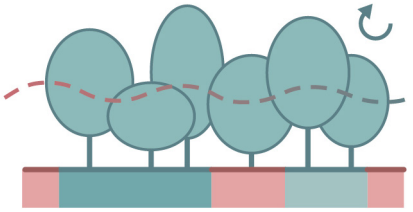
BUILT LANDSCAPE



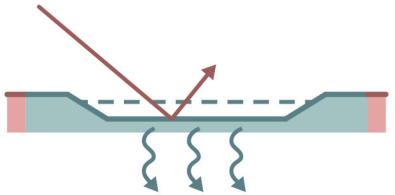
WATER PLAYGROUND



URBAN FOREST



GREEN CARPET



GREEN CARPET

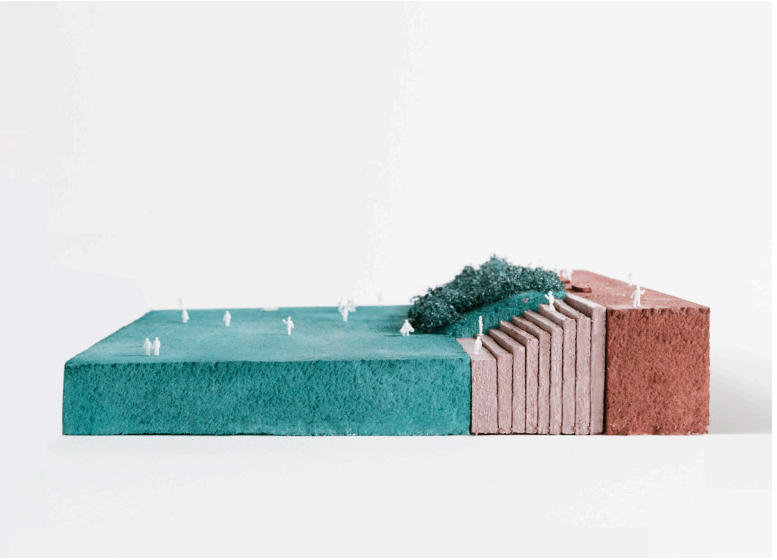
The first active layer coincides with the river itself, which, as previously mentioned, has a dual function from the climate point of view. On the one hand, it serves as a reservoir for the accumulation of meteoric waters, especially in case of heavy rains and floods, by keeping within it most of the flow that is generated and thus limiting what is created in the streets with the consequent risks for the population. On the other hand, the river in this stretch acts, thanks to the large presence of green surfaces that cover the bed, on the superficial temperatures, making them lower than those of the portions of neighboring cities.[1] The project preserves these capabilities as a climate device, keeping the surfaces completely natural and preserving the emptiness that it defines, as well as the way to use space, which is kept completely flexible and open to spontaneous functions by the citizens, only acting on the boundary between the river and the city. The concrete embankments that today

1. V. Olgyay, *Progettare con il clima. Un approccio bioclimatico al regionalismo architettonico*, Franco Muzzio Editore, 2013, pp. 92-93

FIG. 1 Massimo Vitali, *Picnic Allée*, Paris, 2000

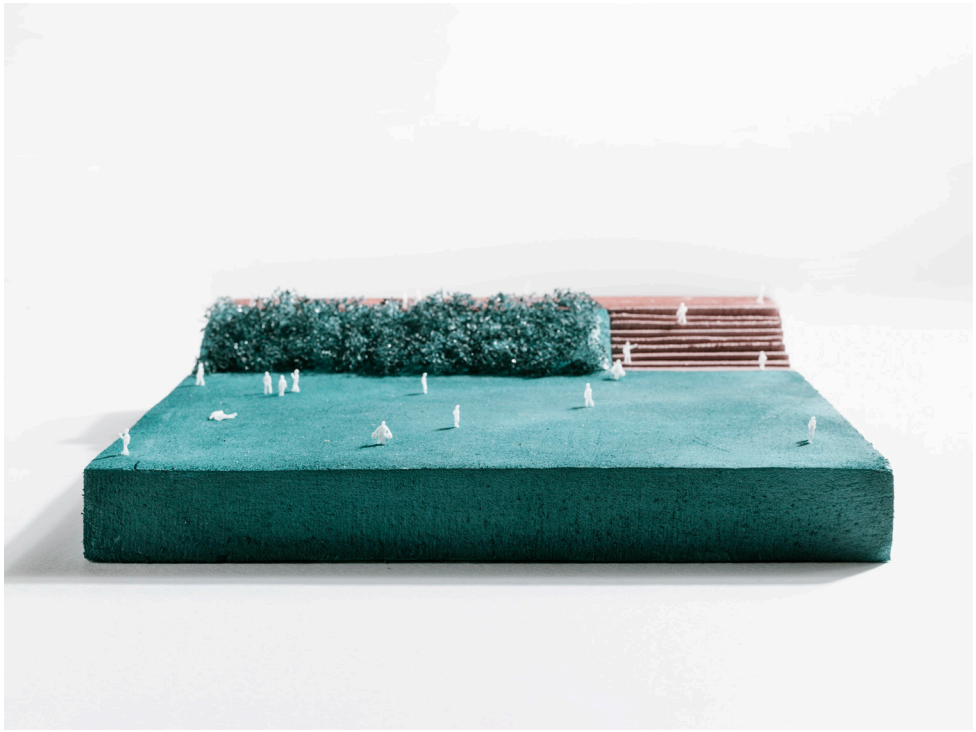


flank it, in fact, are demolished and leave room for a slight slope that, taking advantage of the width of the river, recreates the border in a more gradual and sinuous way. This inclined surface, also treated with natural materials, is then covered by a mantle made of low-stemmed plants that improve the absorption capacity of meteoric waters and that make the Guadalmedina once again an ecological corridor for flora and fauna, to restore, even if only partially, the biodiversity previously present in those areas. Finally, this sort of garden of shrubs is interrupted in some points where elements such as ramps and stairs are provided, useful to ensure continuous access and connection to the spaces of the river.











URBAN FOREST

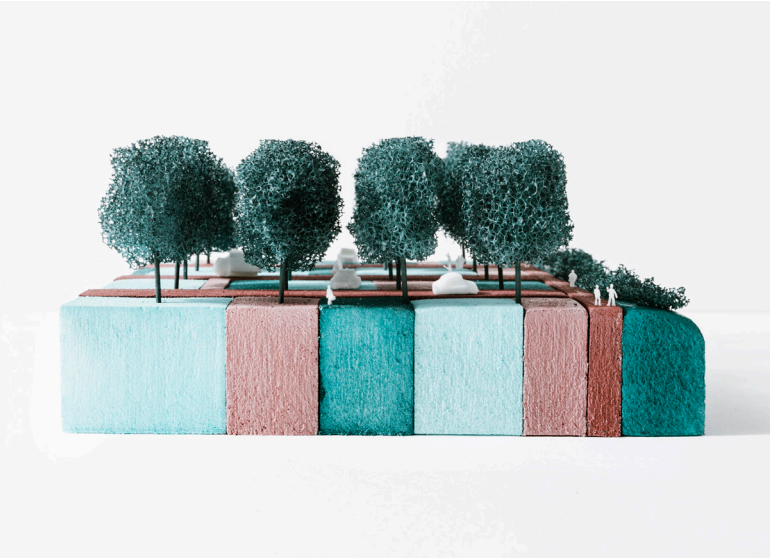
The second layer is defined in the area where today there is the parking of the stadium, in direct contact with the spaces of the Guadalmedina River. The idea behind the definition of this space is to integrate with the river, which as a result of the planned interventions becomes an important green space characterized by vegetation that gets higher as you approach the edges, continuing this trend and harboring a dense high vegetation. This, composed of different species to ensure as much as possible the presence of biodiversity within the project, concentrated in a longitudinal layer, forms a sort of urban forest, which acts on many levels on the climate. First of all it is placed as a filter, seen its elongated shape along the north-south axis, due to the warm winds that are perpendicular and that, especially in some days of the year, cause a significant rise in temperatures. Passing through this thick blanket formed by the foliage from the trees, in fact, these warm winds become colder, turning into cool

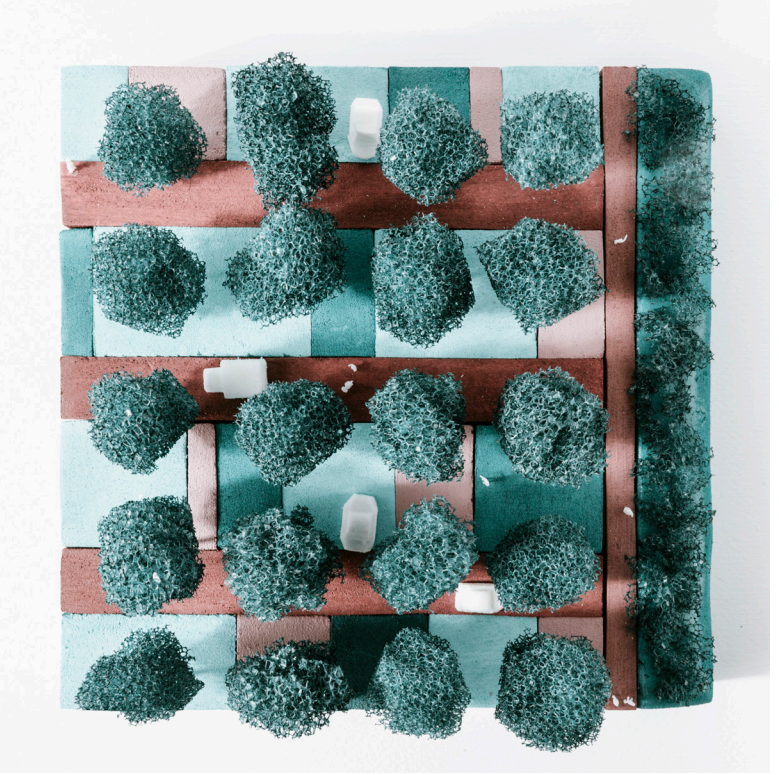


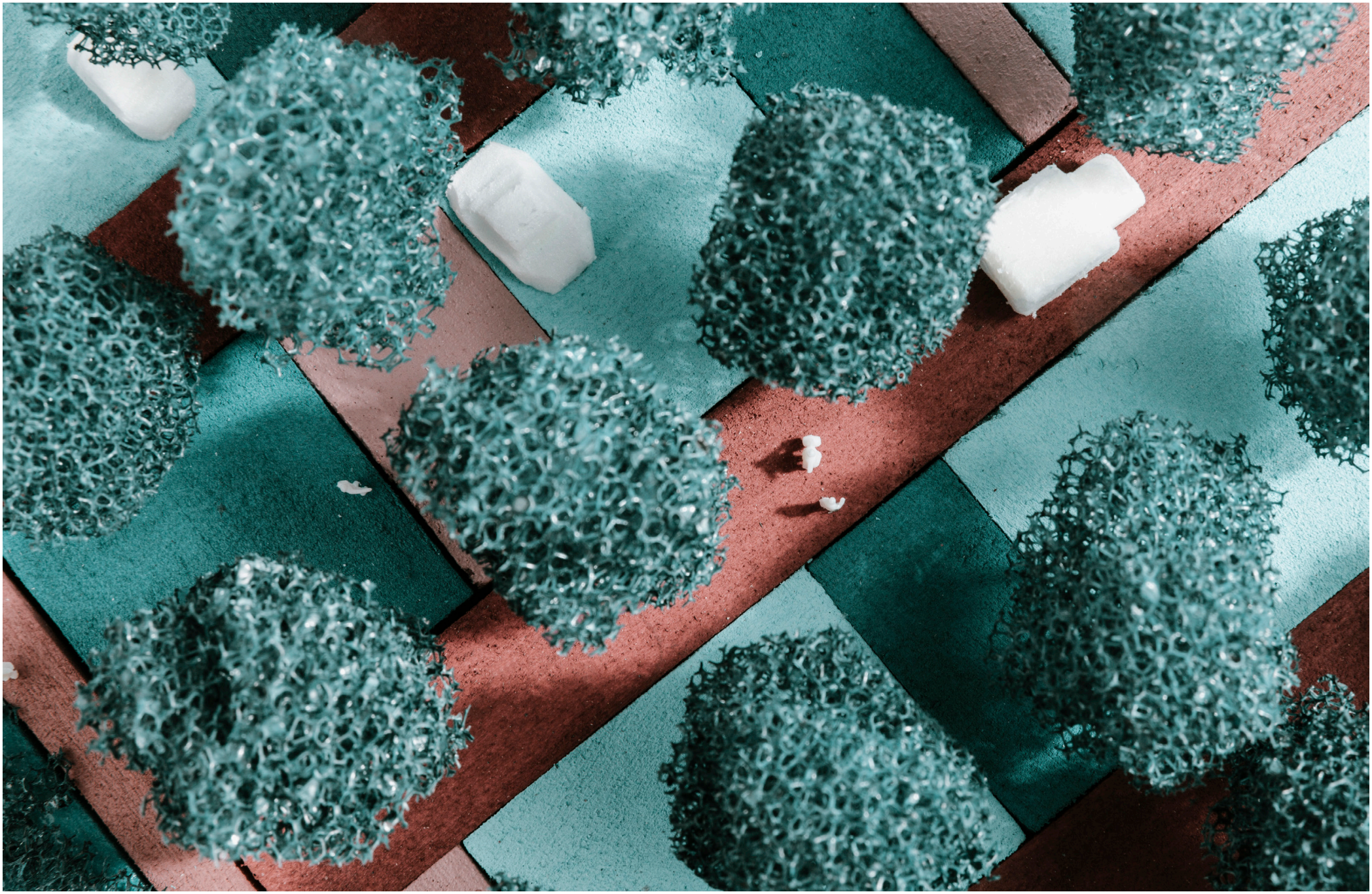
FIG. 1 Bernardo Secchi, Paola Viganò, *Theatreplein*, Antwerp, 2008

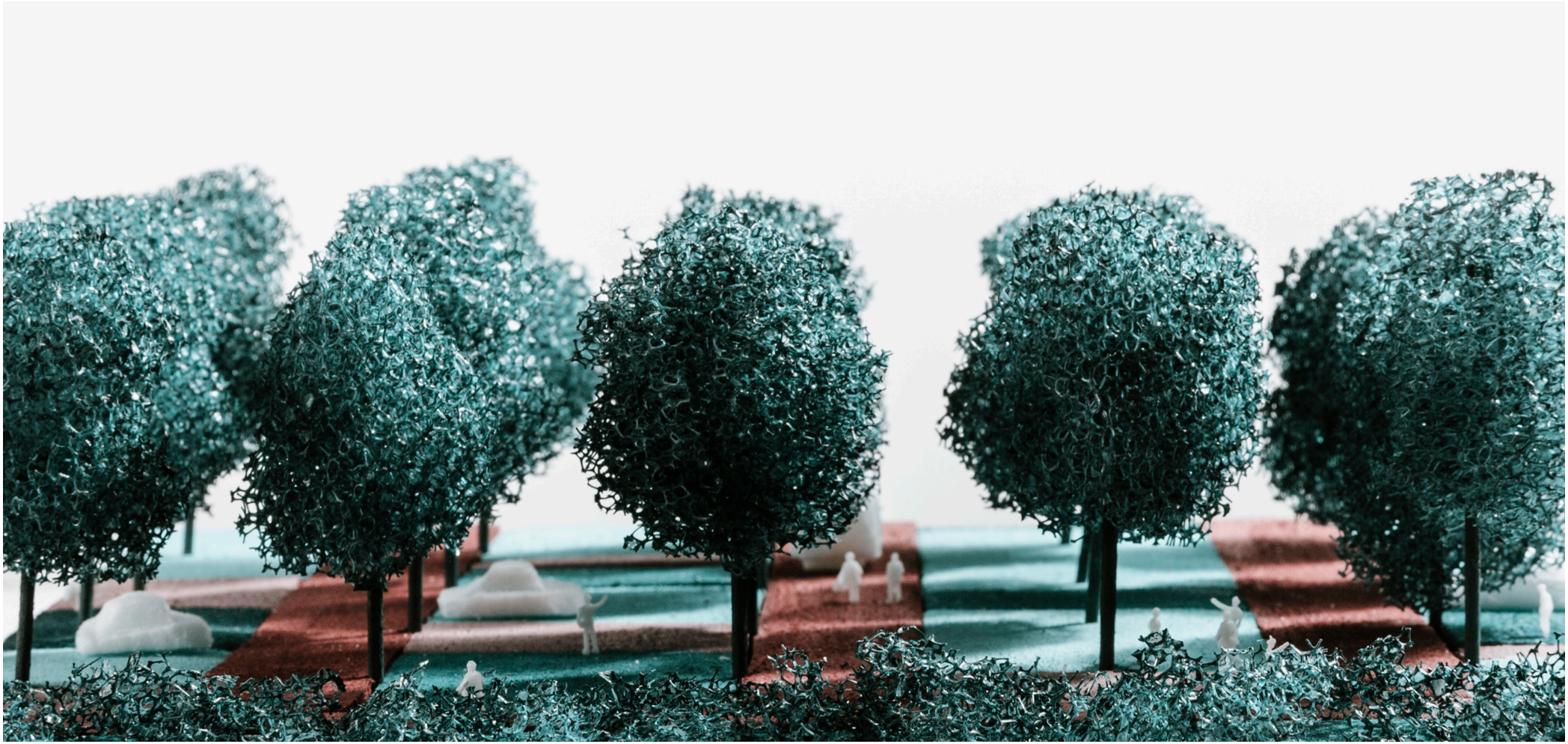
breezes that can also be enjoyed by parts of the city not in close contact with this area.[1] Also in relation to temperatures, the urban forest acts by generating a microclimate cooler than the urban one, thanks to the green surfaces that contribute to a reduction of the surface heat and to the large areas of shade that are created under the trees. From the point of view of the use of spaces, instead, the forest welcomes, under its dense foliage, different functions and not always well defined; often, in fact, these spaces, including for example the parking of the stadium that is partly maintained, take up the flexible character typical of the Guadalmedina River constituting a simple support for the most diverse activities.

1. M. Krautheim, R. Pasel, S. Pfeiffer, J. Schultz-Granberg, *City and wind: Climate as an Architectural Instrument*, DOM Publishers, 2014, pp. 64-65













WATER PLAYGROUND

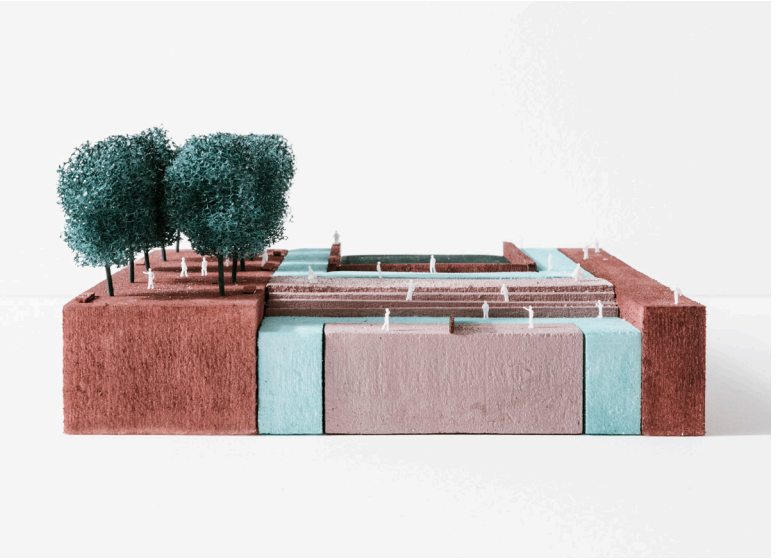
The layer defined as water playground is a central sector within the project as it is here that the transition between the urban and the natural defined by the two previous layers takes place. Inside, in fact, there are artificial and natural surfaces, parts with a greater presence of arboreal species and others that are devoid of them. The element that defines this transition most strongly, however, is water. For centuries, water has been used as an architectural and urban tool, because it is able, as well as vegetation, to substantially change the climatic-environmental conditions of a place. Specifically the spaces designed in this sector, which use water in different ways, from tanks that work in a similar way to those of the historical fountains, to points where it covers hard surfaces as a veil, up to areas where water is nebulized or in the form of jets, have the ability to reduce surface temperatures by generating, through the phenomenon of evaporation, a cooler microclimate.[1] This, in contrast to the heat of the

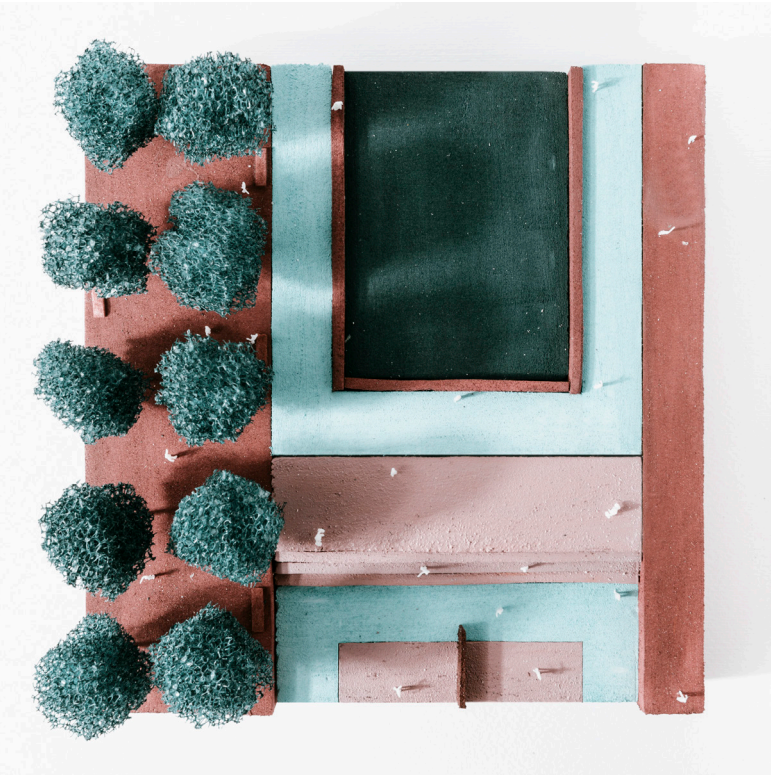
1. V. Olgyay, *Progettare con il clima. Un approccio bioclimatico al regionalismo architettonico*, Franco Muzzio Editore, 2013, p. 92



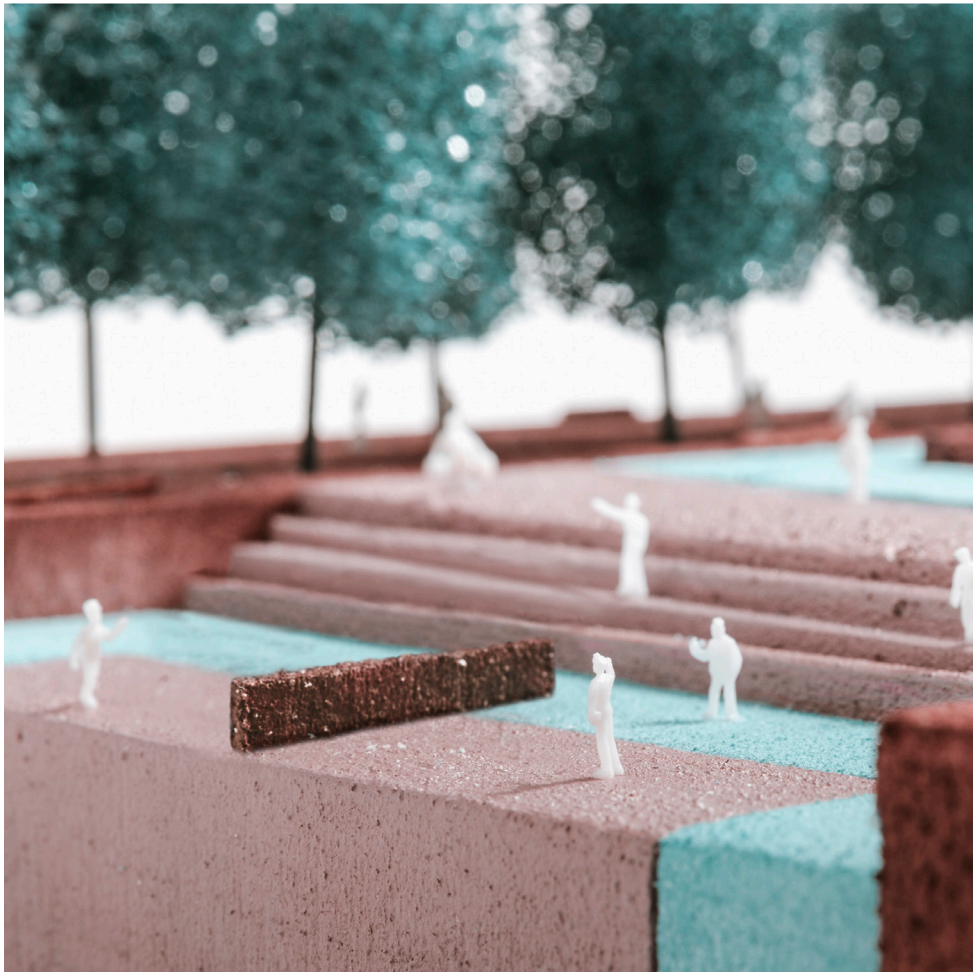
FIG. 1 Jeppe Hein, *Appearing Rooms*, Passariano, 2004

parts of neighboring cities, generates convective motions through which this sector affects their temperatures. In addition, many of the spaces designed within this active layer are designed to perform, in case of need, as the Guadalmedina riverbed, that is accumulating part of the meteoric waters in specific points located below the ground level, so as to ensure the safety of the area and maintain a high level of comfort in other spaces and connection elements. Finally, part of these collected waters is thinked to be reused, in order to compensate for the growing shortage due to climate change.











BUILT LANDSCAPE

The last active layer is located in the westernmost part of the voids system, in direct contact with the tall splint residential buildings that act as a backdrop, cutting the views on what lies behind. The strategy linked to this specific layer consists in providing a densification that, however, preserves at the same time the vacuum that is present today and functions as a filter between the new public space and the adjacent urban landscape, eliminating as much as possible the border between city and project. To do this, the new buildings are designed in line with those of the next context, i.e. with a stick shape, aligned with them but oriented in the opposite way to make the best use of solar radiation and above all to be in the same direction of the prevailing hot winds, becoming from this point of view instruments for environmental sustainability.[1] In addition to orientation, in fact, they are raised in relation to the ground level, so as to preserve the underlying soil, in a perspective of sustainability,

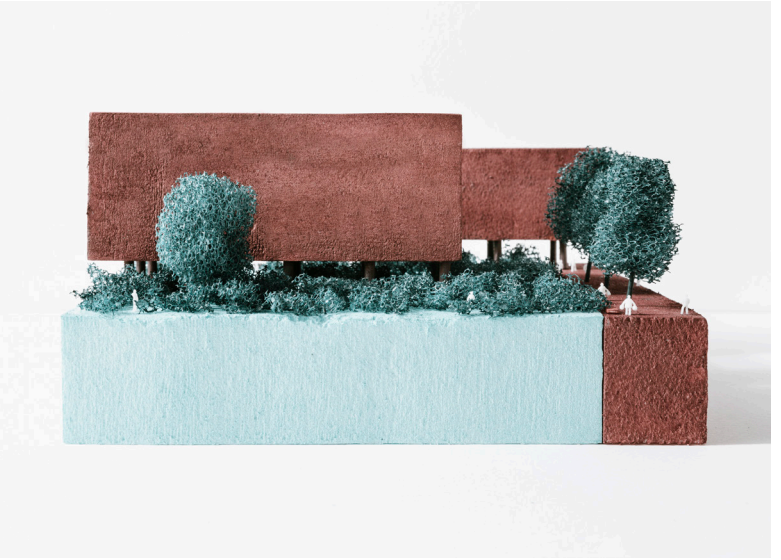
1. S. Sassen, *A Third Space: Neither Fully Urban nor Fully of the Biosphere*, in J. Graham, C. Blanchfield, A. Anderson, J. Carver, J. Moore, *Climates: Architecture and the Planetary Imaginary*, Lars Müller, 2016, p. 173



FIG. 1 Office Kersten Geers David Van Severen, *Garden Pavilion*, Venice, 2010

and allow a continuous development of public space below. Moreover, this choice also allows buildings to be resilient to possible climate events such as floods and to generate spaces of shade useful to reduce surface temperatures. In line with the vision proposed by Giovanni Battista Nolli in his *Nuova pianta di Roma*, in which for the first time the courts of the blocks and the interior of the most significant public buildings are represented as an extension of the urban voids,[2] the objective of this active layer is therefore to demonstrate that the design of the built, if integrated with the design of the city, can become an integral part of the project of open spaces, giving life thanks to this synergy to interesting urban geographies.

2. F. Purini, *Il vuoto contro il pieno*, in M. Manieri Elia (edited by), *Topos e Progetto: Il Vuoto*, Gangemi Editore, 2008, pp. 49-50











DESIGN FOR COMPLEXITY

The active layers, while constituting the strategy that, starting from the considerations of urban and climate nature, define the project, do not actively draw the geometries of the new urban space of Martiricos. A project that defines the new urban geographies strictly following the characteristics of the individual strips, in fact, would be excessively restrictive and not capable of generating a portion of the city with the right degree of complexity. The latter, obtained through the construction of a hierarchy that includes different levels of meaning of the elements and generates ambiguity and tension between the parts placed in contrast to each other,[1] is in fact a fundamental component to take into account wanting to intervene in an urban context, as it generates spaces of higher quality defined as a sequence of situations rather than the result of the repetition of similar elements between them. In order to understand the importance of complexity for the urban scale project it is sufficient to observe the center of any city and compare it to its suburbs: the first, recognized

1. R. Venturi, *Complexity and Contradiction in Architecture*, The Museum of Modern Art New York, 1977, p. 30



FIG. 1 OMA, *Ville Nouvelle Melun Senart*, Melun, 1987.

as spaces of greater quality, is in fact generated by the overlap, more or less random, of functions and architectural objects happened over the centuries and by differences and conjunctions between parts,[2] therefore possesses a high degree of complexity; the second, always seen as a marginal space compared to the rest of the city, is born instead through the definition of an architectural object and its repetition, resulting decidedly less complex.

In order to imagine a design scenario where the initial condition of indeterminacy contrasts with a new complex and well-defined urban geography in its different parts, therefore, a fragmentation of space is proposed that, although starting from the strategies defined by the active layers, it is defined as a sequence of many smaller spaces, different from each other, which create synergies but also conflicts. These "rooms", in fact, give life to many urban situations not always linked to each other, generating a space highly designed and equally experienced. Inspired by the project *Melun Senart*, by OMA, these spaces are defined using the layering method, which consists in dividing the various components that define the space and design them in a semi-dependent way from each other, every one created according to its own needs, make them overlap and be faced with nodes in which they generate interactions or conflicts, able to enhance each part of the project according to the relationship with others.

2. Vittorio Gregotti, *Il disegno degli spazi aperti*, in *Casabella n. 527*, 1986

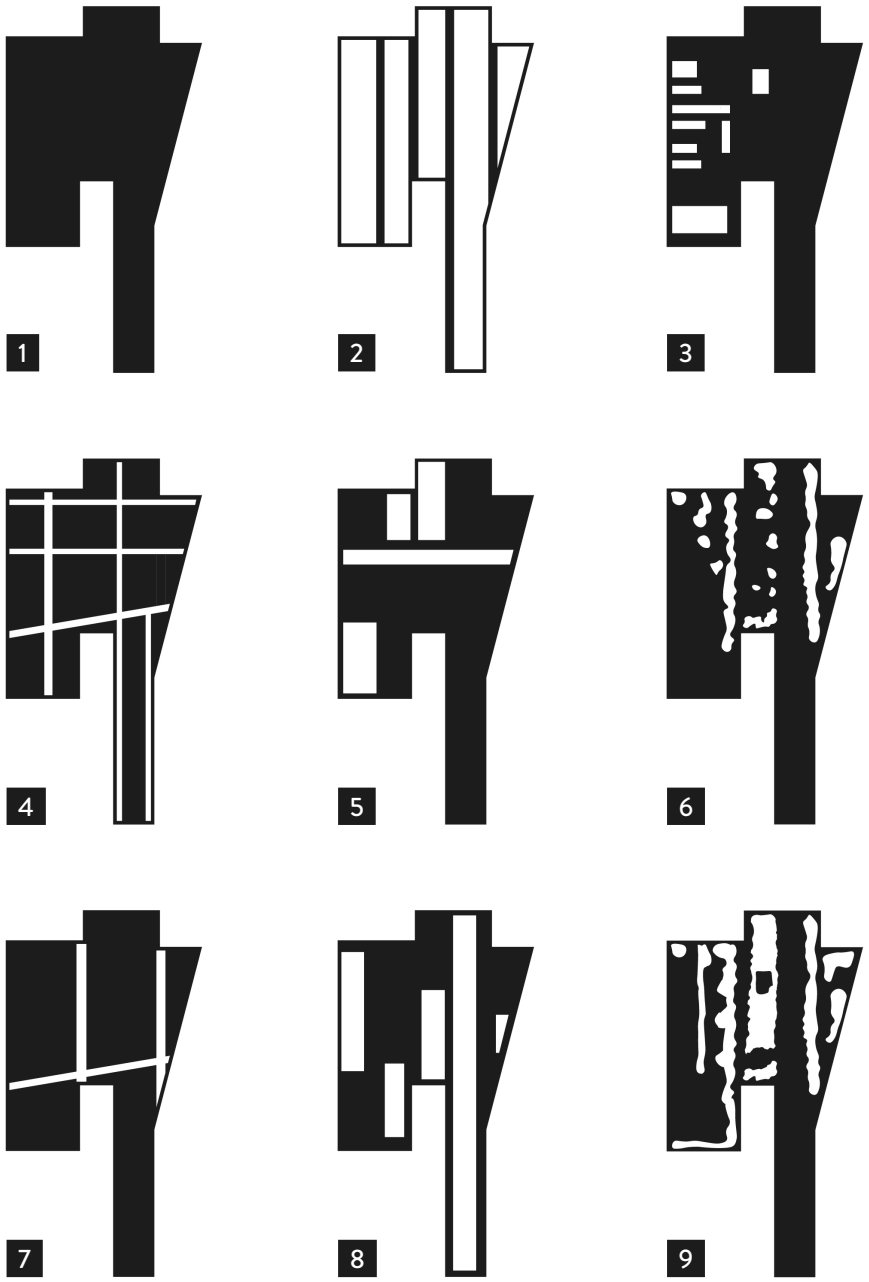


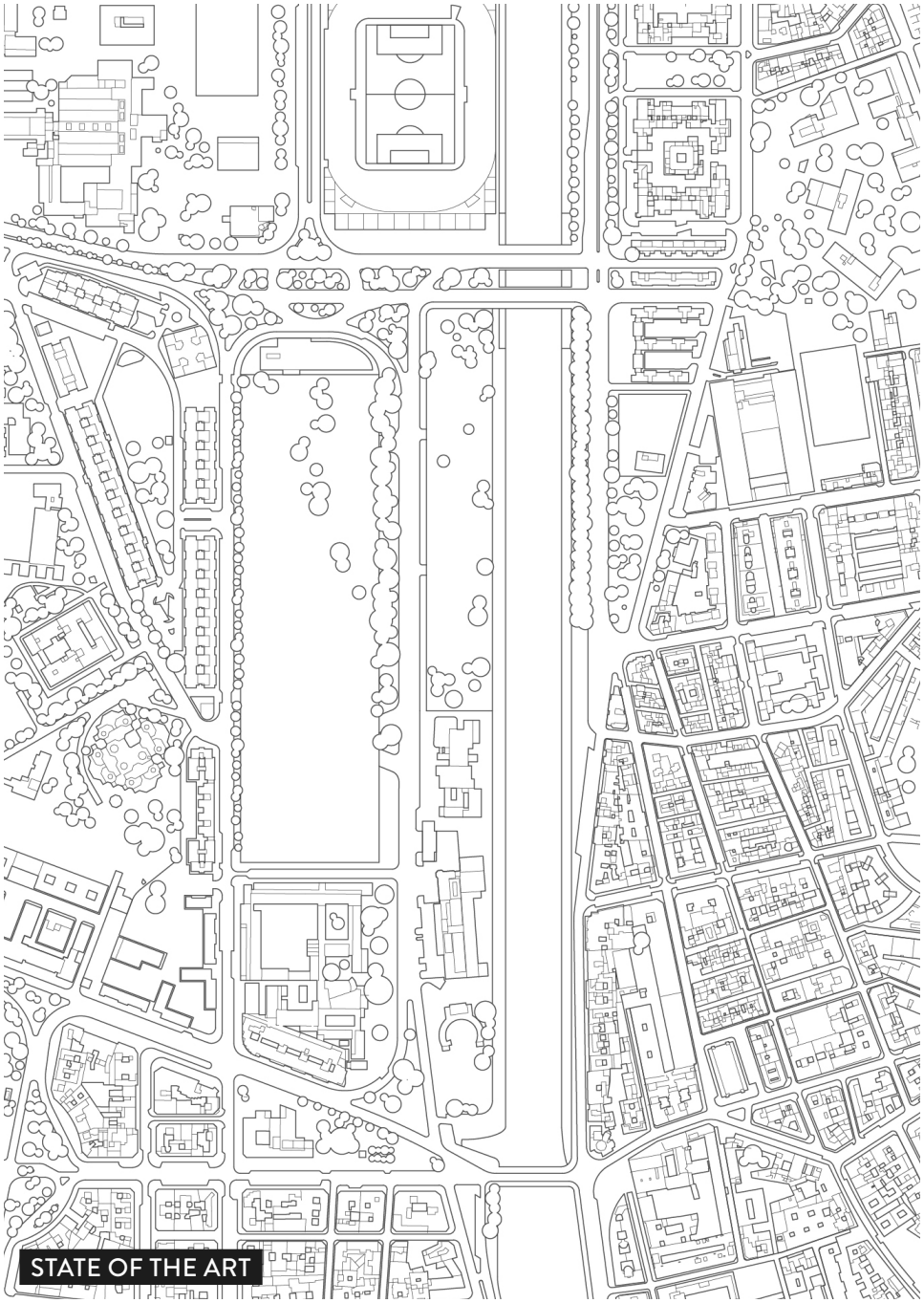
FIG. 2 Concept of the different layers used in the design process.

1. System of voids
2. Active Strips
3. New buildings
4. Sweet mobility
5. Main urban voids
6. Existing trees
7. Car pathways
8. Main green voids
9. New trees

Among the various layers used, the most important is undoubtedly the new mobility, which redefines the space of Martiricos thanks to the definition of two new important pedestrian axes. The first, in fact, connects all the layers crossing them perpendicularly and defines at the same time a new connection between the two sides; the second, instead, uses the existing portal of the building headquarters of the newspaper *Sur* to define a new connection that cuts the new space designed longitudinally and connects with the porch below the stadium. The sum of this and the other layers, including the built and green open spaces, gives life to the new urban landscape of Martiricos.

" The most important of the morphological objectives of the design of open spaces: the necessary and legitimate articulation (that is proportionate to the use) of the parts and their mutual relationship, by hierarchies, separations, conjunctions, differences of the main characters, by the superimposition of functions and meanings: that is, against any design of reduction which is the typical character of the urban peripheries of our time, of their indifference to identity. "

Vittorio Gregotti, *Il disegno degli spazi aperti*, in *Casabella n. 527*, 1986 (own translation)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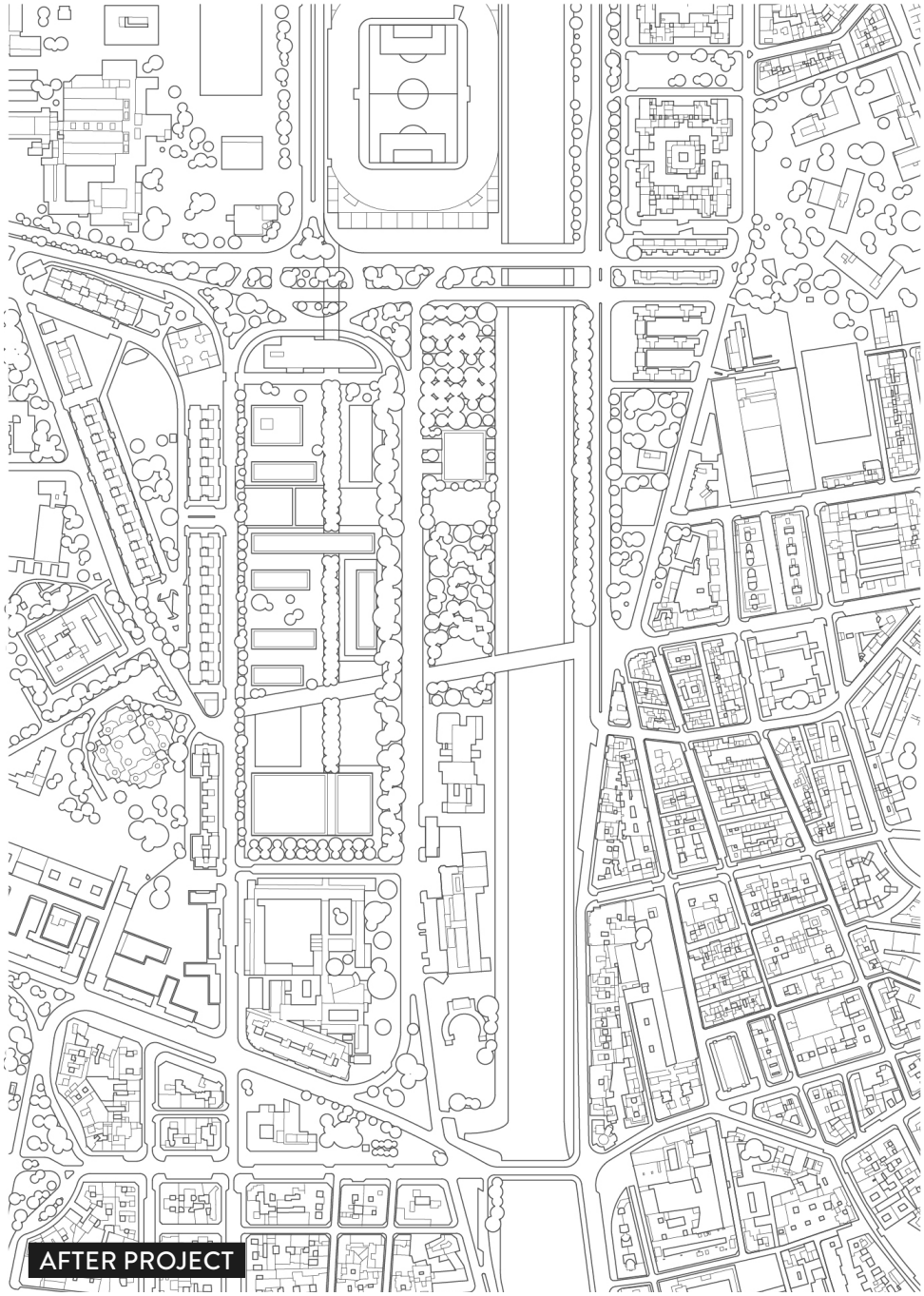

AFTER PROJECT

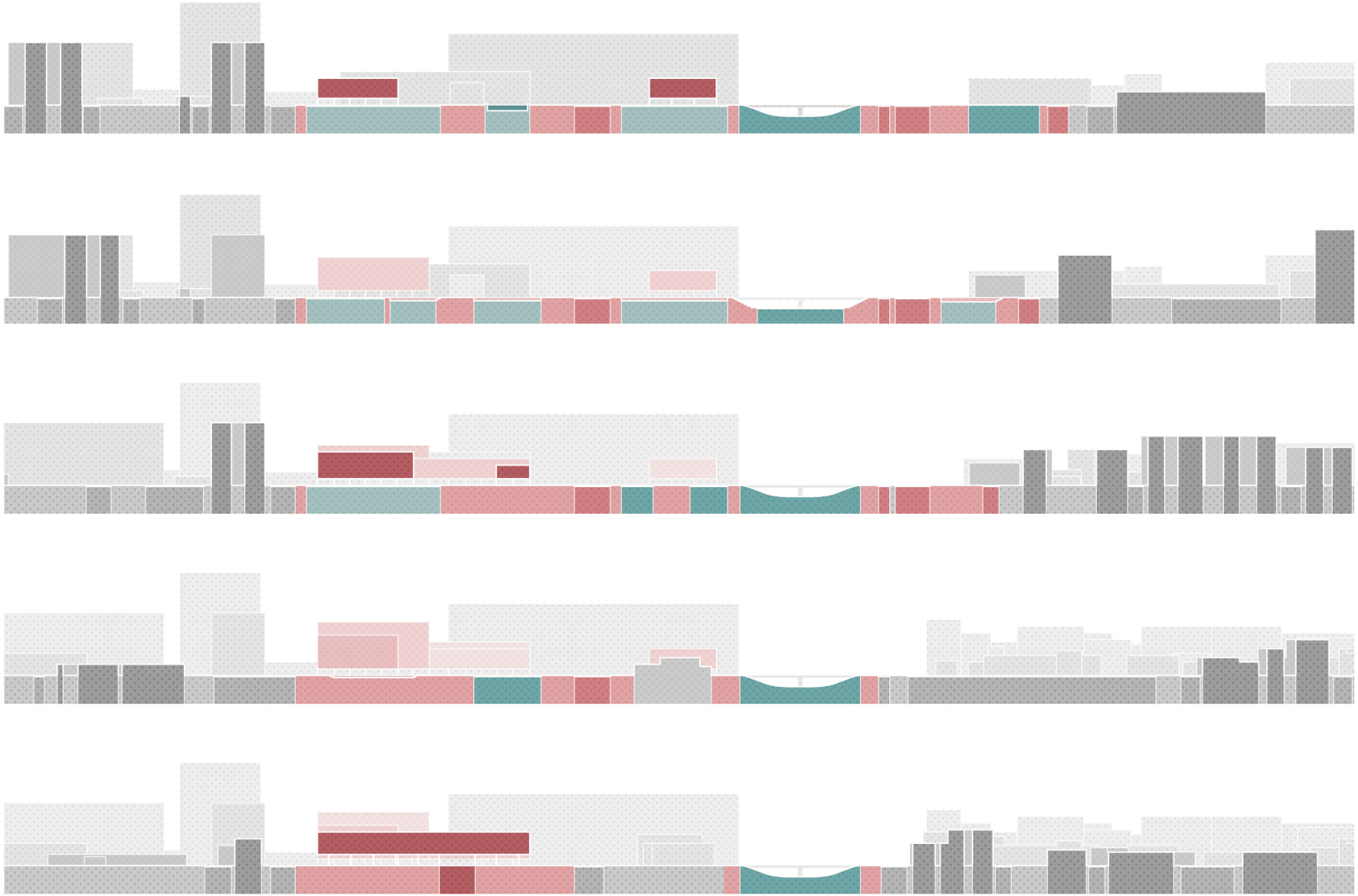
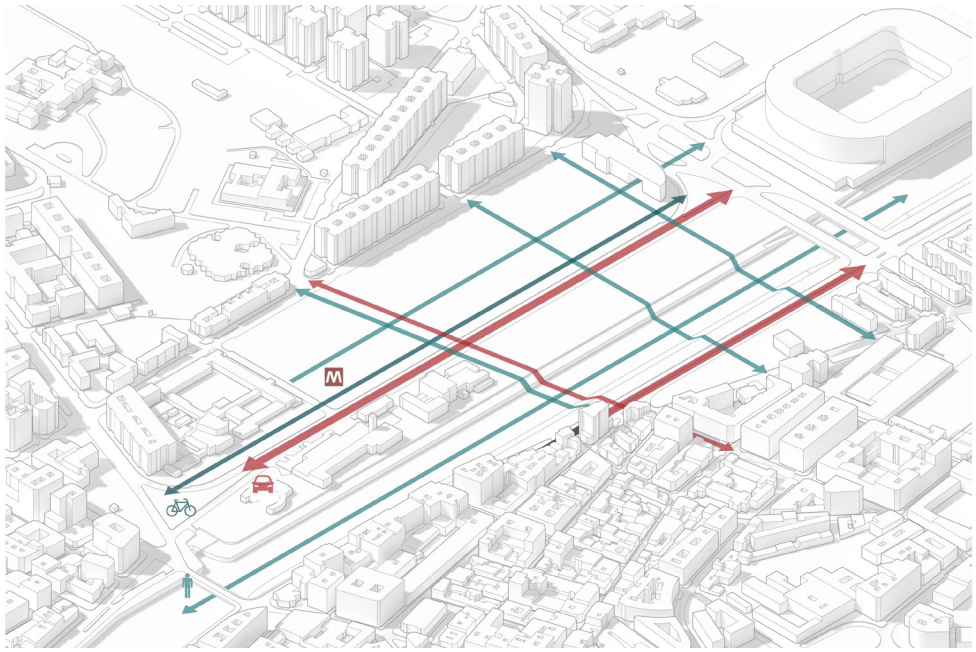


FIG. 3 Transversal sections of the project

ATLAS OF COMMON PLACES

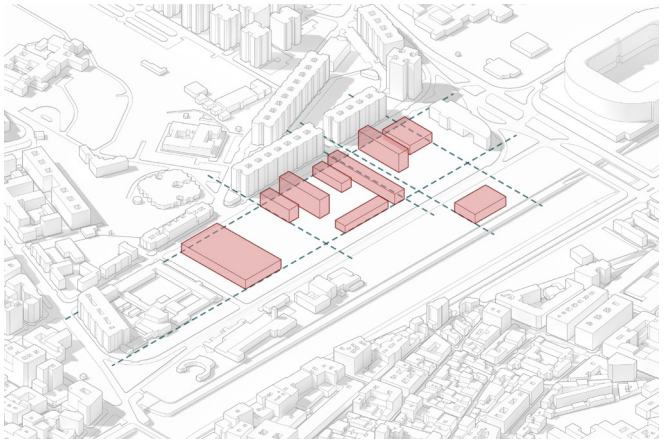
The new urban space of Martiricos, designed as previously seen through the juxtaposition of different layers including that of the new mobility system, conforms in all respects a large urban void, that preserves the pre-existing character of the area even though with a greater articulation of the spaces. Despite this, however, the project also provides for the construction of some buildings that, positioned within the system of voids contribute to generate a fragmentation of space that can increase the degree of complexity and conflict between the parts. These buildings, defined in such a way as to integrate with the context in which they are inserted becoming a filter between it and the new project, conform, at a functional level, in order to accommodate new residential spaces but also public functions and services, generating a *mixitè* of activities that ensures a continuous use of its spaces over time. Among all, the attraction function given by the new cultural center is particularly central, which,

NEW MOBILITY SYSTEM

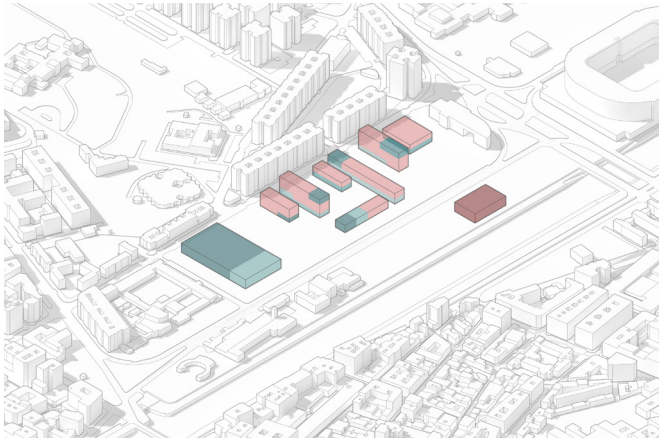


following the trend of many other buildings in the area, fits into the urban network of spaces related to the cultural area. In order to preserve the integrity of the urban void, in addition, the buildings designed rise above ground level, relying on the new public space and avoiding the rhythm in rise.

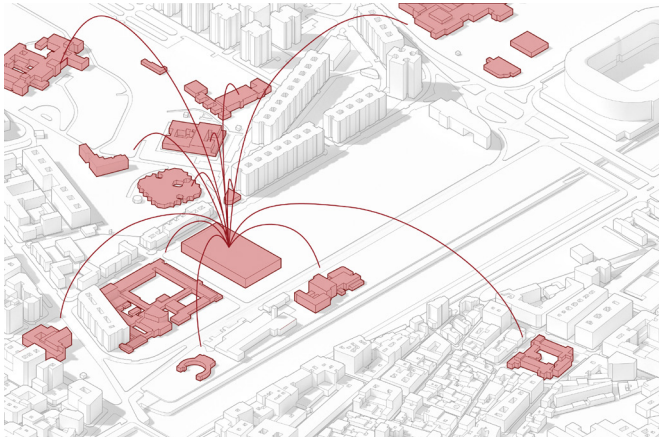
The result of the relation of these buildings and the project of voids is capable to redefine the public space of Martiricos and can be seen, from the point of view of the people and the use they can make of it, as a sequence of different urban situations, spaces defined from an idea of specific use, or as the desire to create a flexible support for functions not better defined, and climate considerations. These spaces go beyond the previously seen active layers because, although they identify in part with the strategies they define, they conform in a free way, overlapping between each other and taking different shapes and sizes. Walking inside the new park of Martiricos it is possible to find a large lawn where lie down to read a book and relax, or a fervent market covered by the building that houses the new cultural center; it is possible to walk through a garden of shrubs, sometimes encountering pleasant shady areas, or play a game of tennis; park the car and go to attend a football match, or take a lunch break sitting at the edge of a large tub.



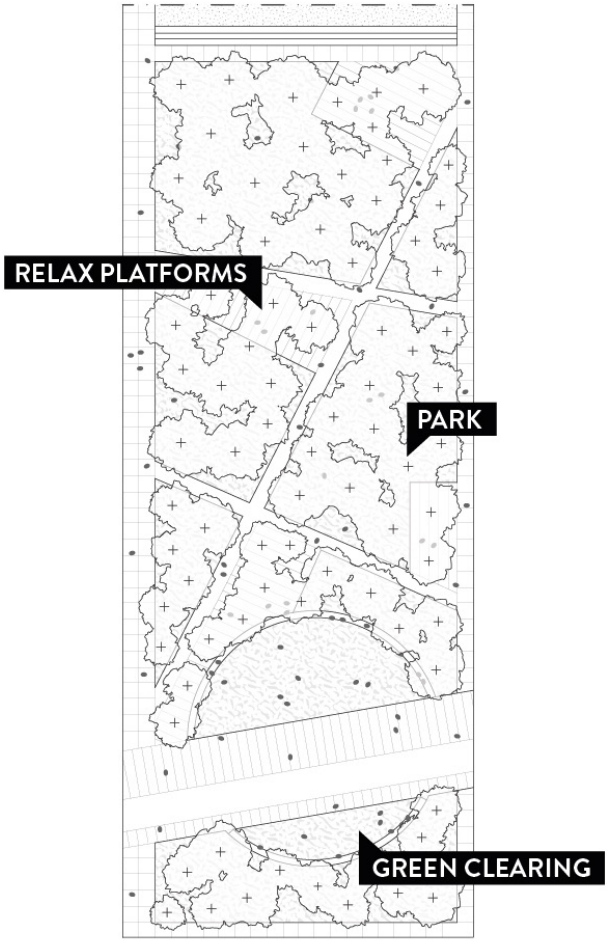
BUILT ALIGNMENTS

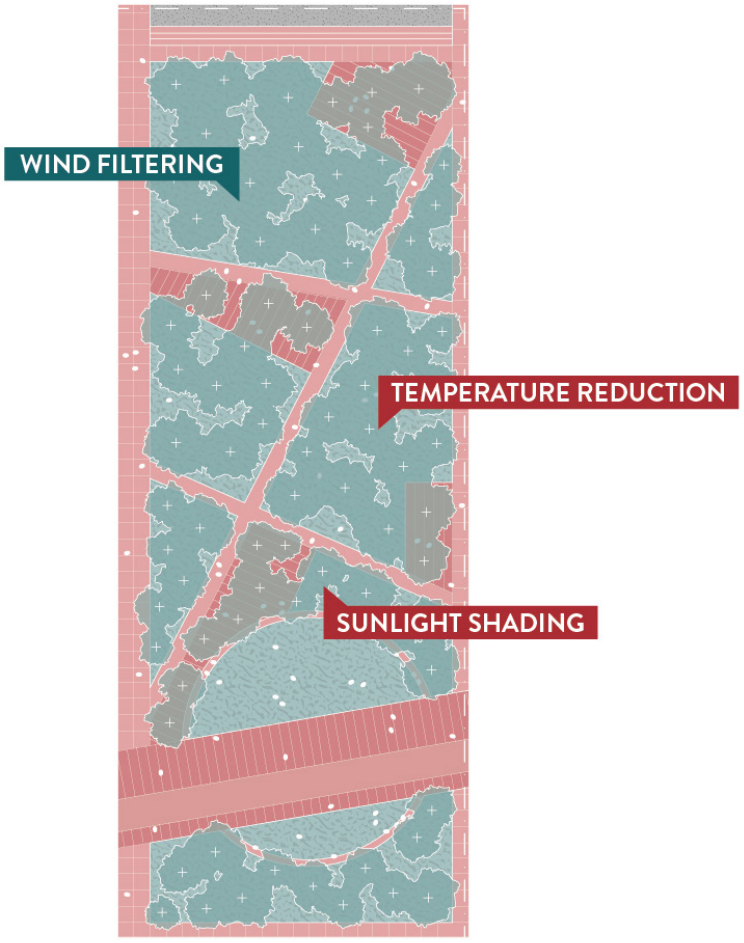


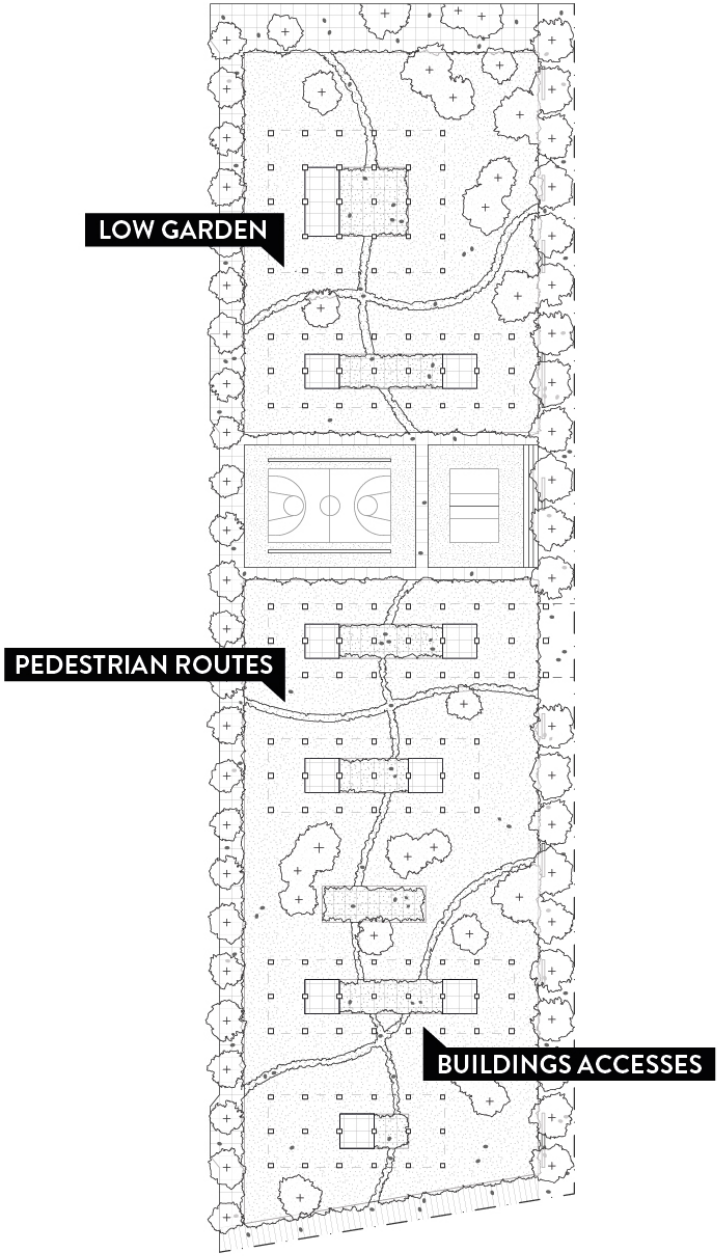
FUNCTIONAL MIXITÈ

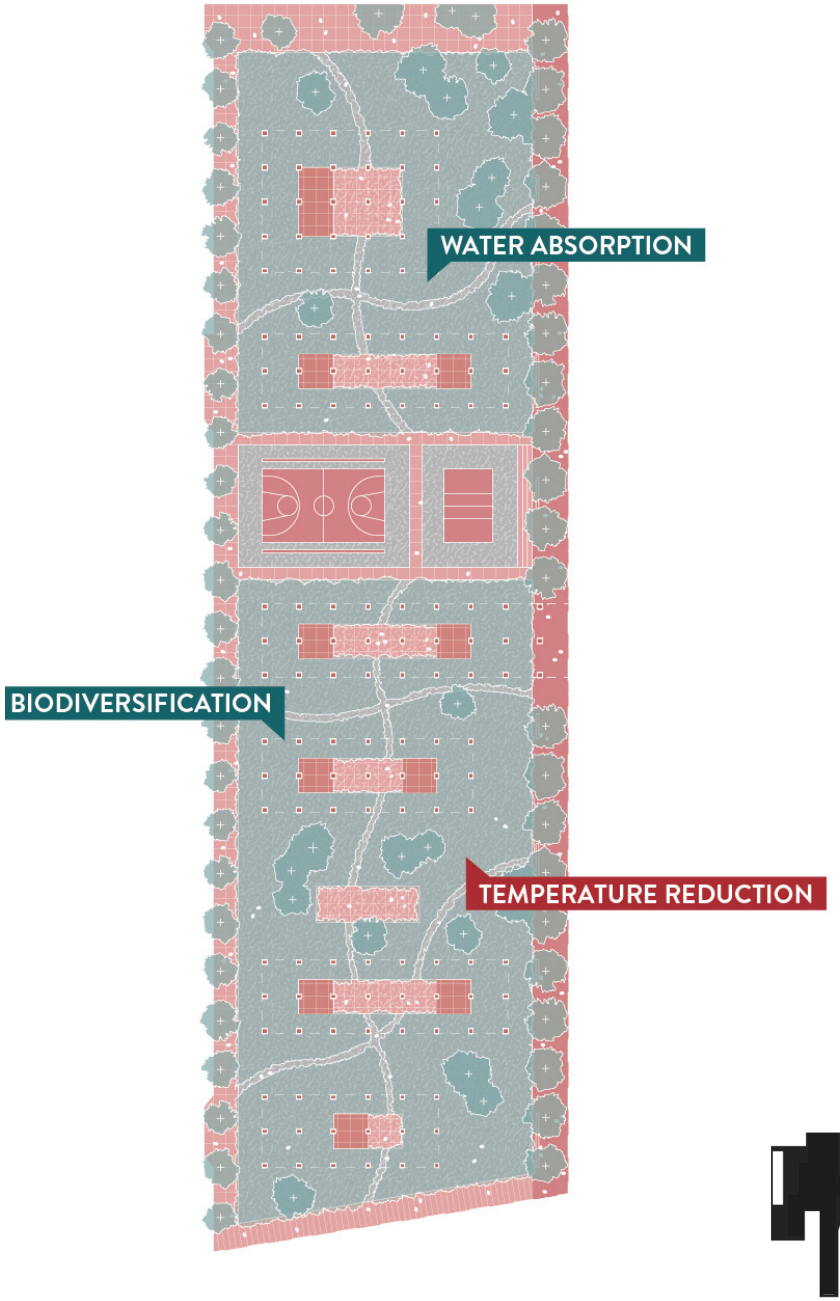


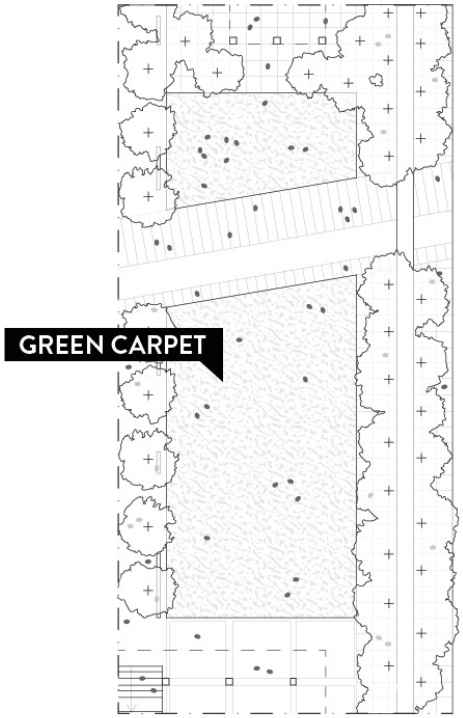
CULTURAL NETWORK

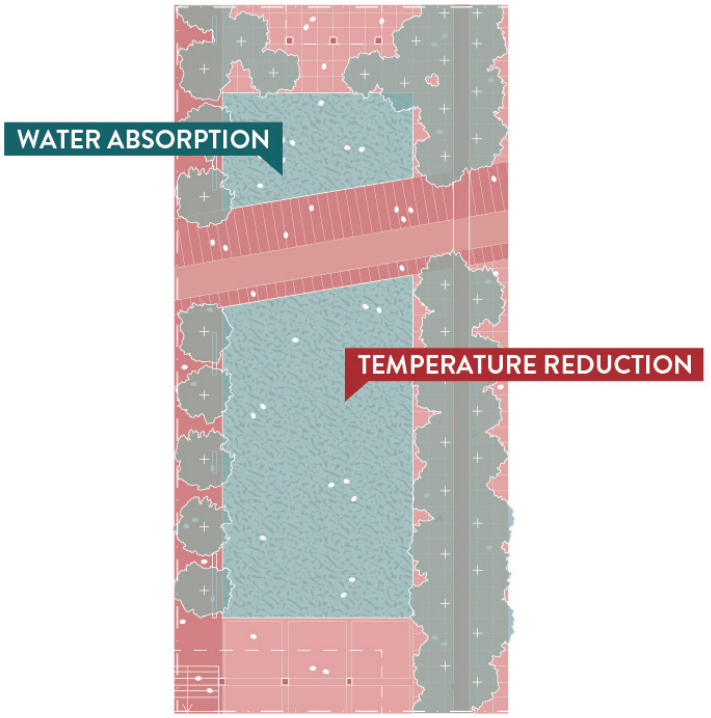

RELAX PLATFORMS
PARK
GREEN CLEARING

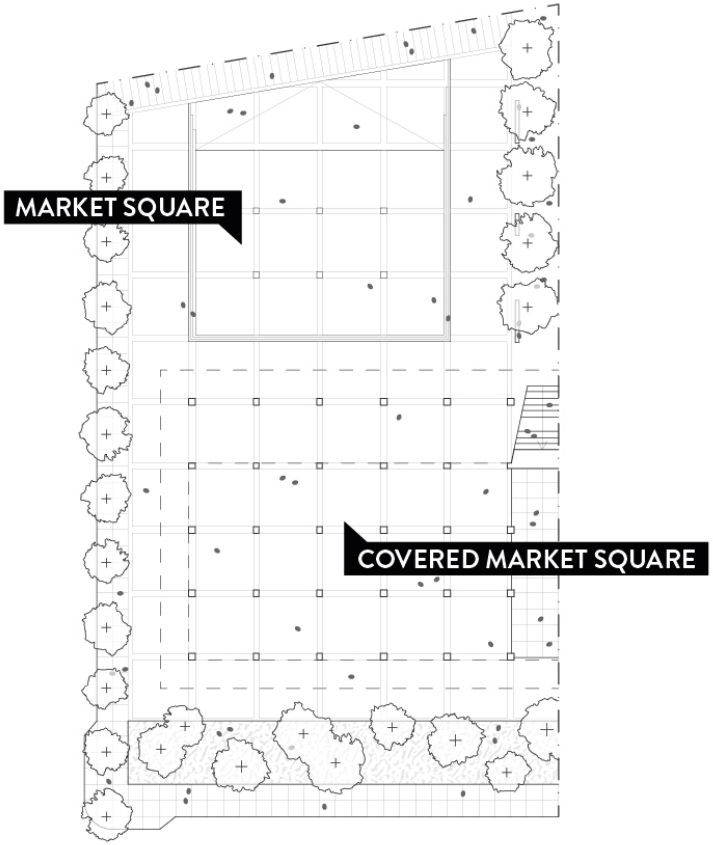

WIND FILTERING
TEMPERATURE REDUCTION
SUNLIGHT SHADING

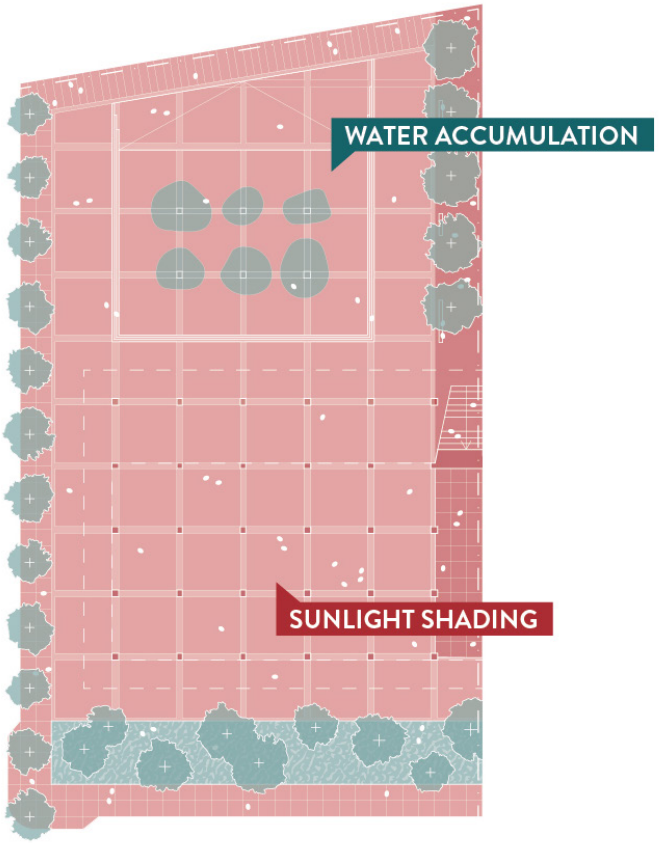

LOW GARDEN
PEDESTRIAN ROUTES
BUILDINGS ACCESSES

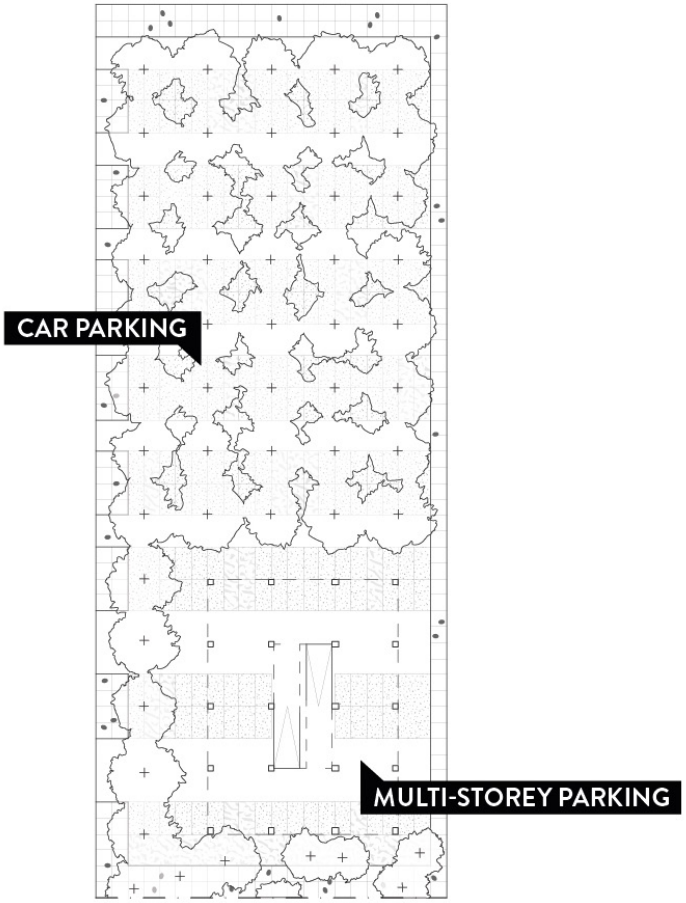

WATER ABSORPTION
BIODIVERSIFICATION
TEMPERATURE REDUCTION

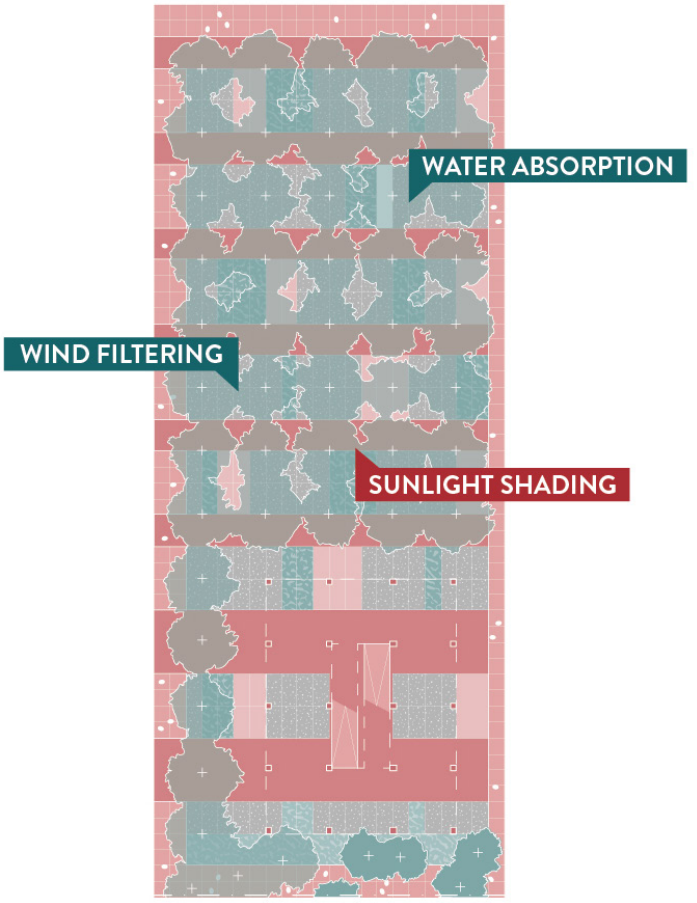

GREEN CARPET

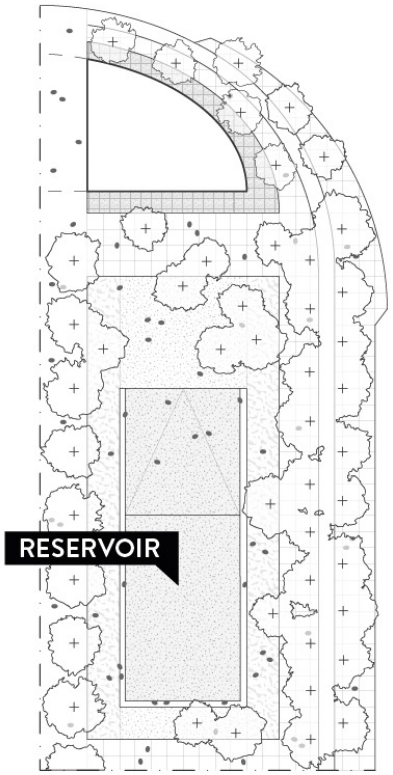

WATER ABSORPTION
TEMPERATURE REDUCTION

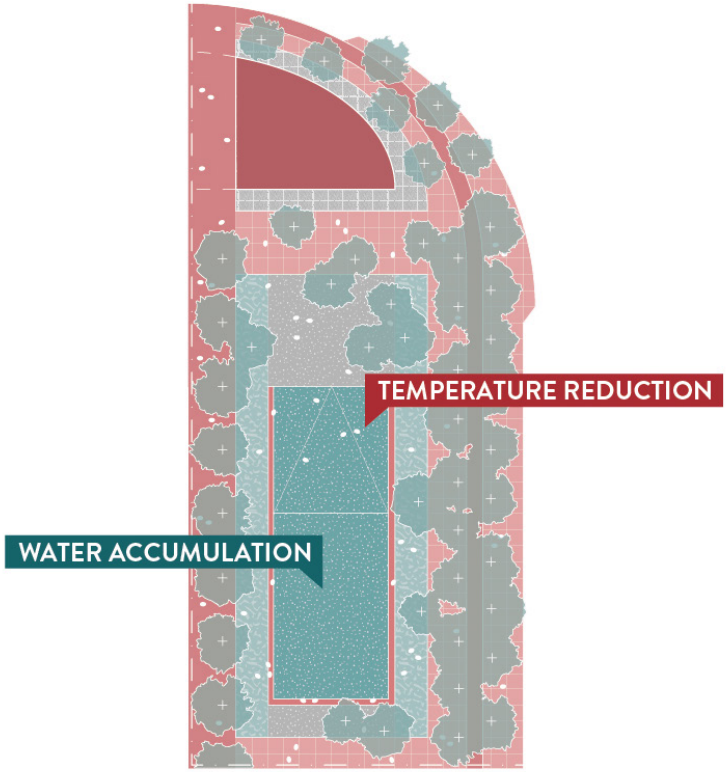

MARKET SQUARE
COVERED MARKET SQUARE

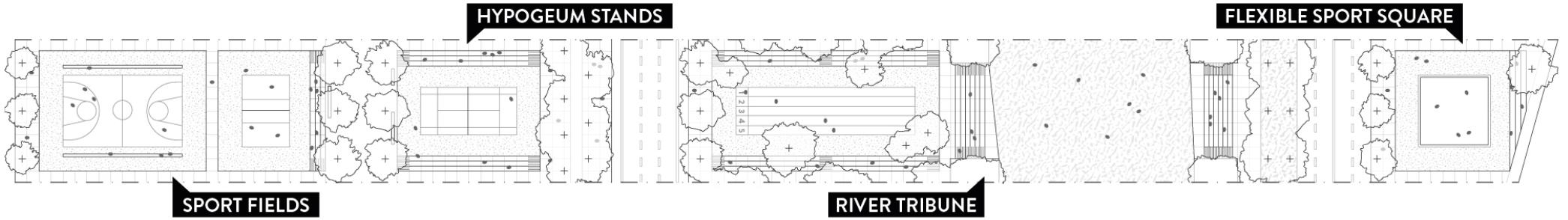

WATER ACCUMULATION
SUNLIGHT SHADING

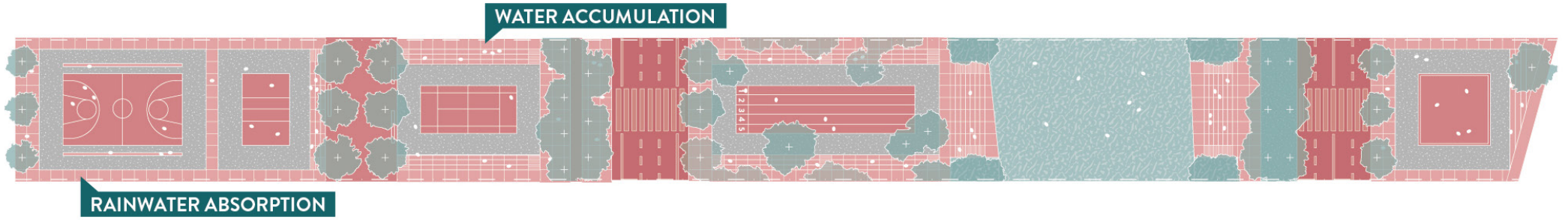

CAR PARKING
MULTI-STOREY PARKING

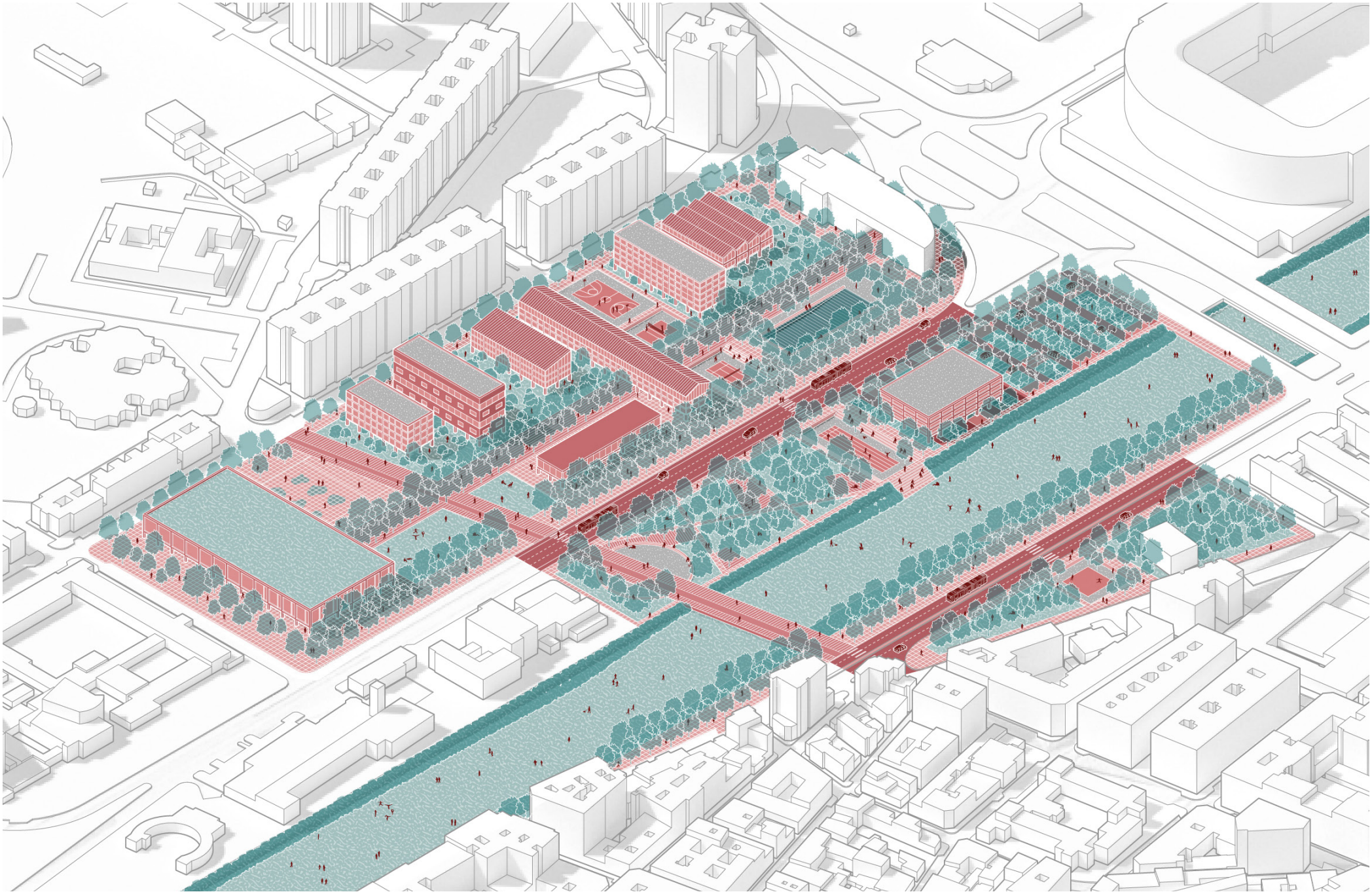

WATER ABSORPTION
WIND FILTERING
SUNLIGHT SHADING


RESERVOIR


TEMPERATURE REDUCTION
WATER ACCUMULATION


HYPOGEUM STANDS
FLEXIBLE SPORT SQUARE
SPORT FIELDS
RIVER TRIBUNE


WATER ACCUMULATION
RAINWATER ABSORPTION



MATERIALS MATTERS

When drawing open spaces, the theme of the soil project is fundamental. From the point of view of the use of space, in fact, the characteristics of the surfaces play a central role, as they have the ability to change the perception of how a place can be lived. As described by Bernardo Secchi, the soil project has the ability to articulate the spaces and, above all, to qualify them, opening to different uses and possibilities.[1] Thinking about the Guadalmedina, for example, it is easy to understand how, although it is poorly maintained in all its parts, it is used by citizens where the characteristics of its surfaces allow it. In this sense, the northernmost areas, although greener than the expanses of concrete present further south, are not livable and therefore are in a state of strong abandonment. From the environmental point of view, on the other hand, the soil project is a way of acting in response to climate agents, as green surfaces are well known, as are the presence of plants and trees, to actively influence

1. Bernardo Secchi, *Progetto di suolo*, in *Casabella n. 520-521*, 1986

these factors and mitigate their effects. It is no coincidence, as we have seen above, that the southern part of the Guadalmedina route has a negative effect on surface temperatures, as opposed to the northernmost areas.

As part of the project proposed for the system of voids present within the Martiricos district, in this regard, the definition of the surfaces that alternate to form the new urban park has played a central role, actively influencing architectural and urban choices. The idea behind the project is, in fact, to preserve the presence of a large urban void within the city, working with minimal interventions and focusing on factors such as the study of green and land design, in order to recreate a balance between paved and natural surfaces and explore the possibilities that each brings with it. For this reason, large spaces that are homogeneous from a material point of view, like the Guadalmedina River itself, are flanked by more heterogeneous spaces and characterized by the alternation of different surfaces. An example is constituted by the parking lot of the stadium that, while maintaining its function and its morphology, is completely rethought in its surfaces, becoming a patchwork of different materials and textures and opening, on days during the week when it is not used as a parking space, to different public functions, becoming an important support for the community.

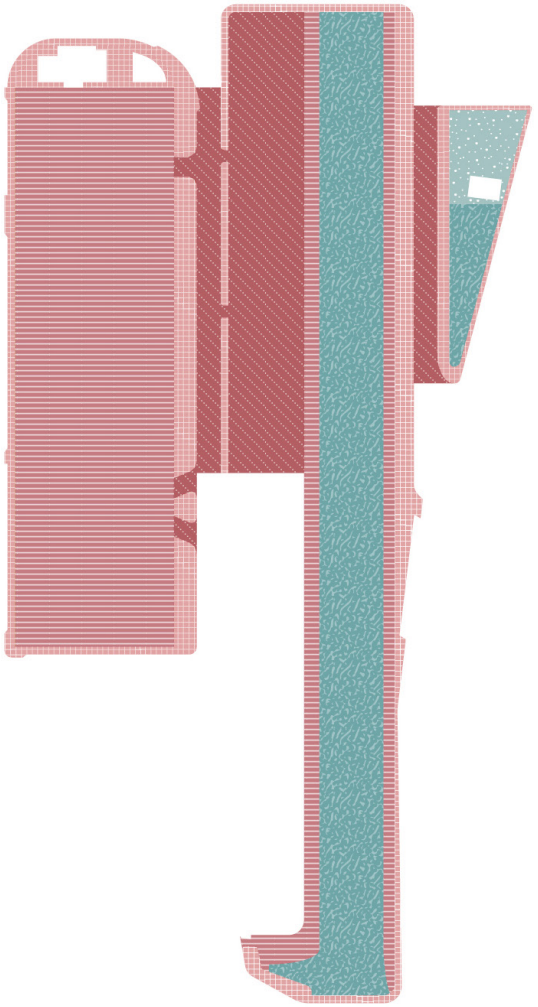
Looking more closely at the spaces designed it is also possible to realize that, at a first differentiation, between natural and artificial surfaces, they need further identification of different materials, belonging to each macrogroup. A natural surface, in this perspective, does not necessarily coincide with a green surface, just as an artificial one does not necessarily materialise in the use of tiles, typical of squares and open spaces of cities in general. On the contrary, by differentiating the material characteristics of the planned soils it is possible to create new urban geographies drawn from atypical textures but which, in the same way, affect the environmental balance of the place. In particular, surfaces have been planned within the project that are permeable but that are not identified in a green lawn, but in spaces with gravel or clay, as well as material surfaces but with different textures, from the concrete floor to the continuous ones. In the same way, areas covered by a more regular vegetation are identified and others where it is present in a more wild and uncontrolled way. This differentiation of the type of green that is designed, besides defining different spatialities between them and generating, as well as the soil project, a high degree of complexity, aims to recreate part of the biodiversity once present on the edge of the river, enhancing its ability to act as an ecological corridor in the urban environment.

FIG. 1 Study of the main plant species typical of the territory of Málaga.

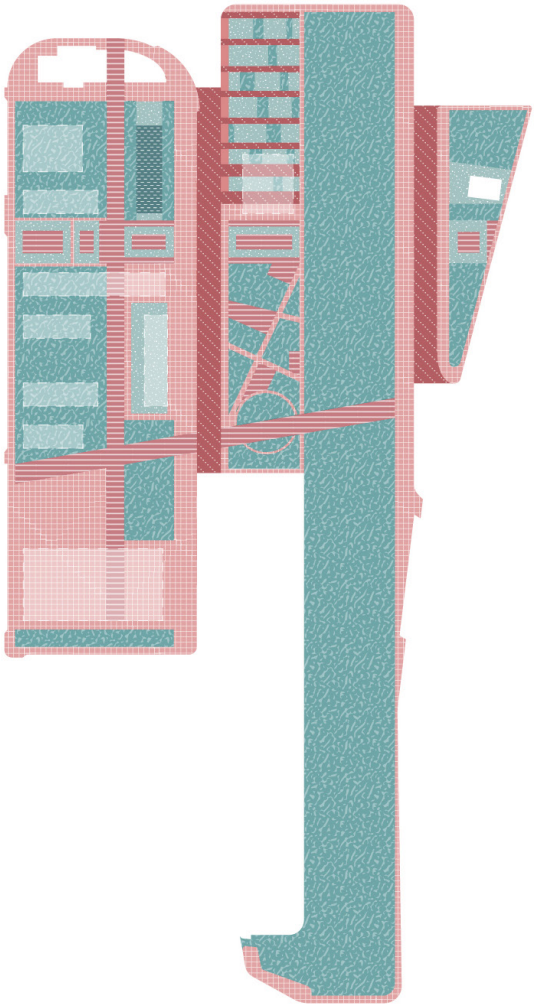
1. *Vitis Vinifera*
2. *Ulex Parviflorus*
3. *Smilax Aspera*
4. *Rubia Peregrina*
5. *Rhamnus Oleoides*
6. *RetamaSphaerocarpa*
7. *Quercus Rotundifolia*
8. *Prunus Dulcis*
9. *Pinus Halepensis*
10. *Phlomis Purpurea*
11. *Phagnalon Saxatile*
12. *Olea Europaea*
13. *Lotononis Lupinifolia*
14. *Lavandula Stoechas*
15. *Lavandula Multifida*
16. *Genista Umbellata*
17. *Dactylis Glomerata*
18. *Cistus Monspeliensis*
19. *Cistus Ladanifer*
20. *Cistus Albidus*
21. *Chamaerops Humilis*
22. *Aristolochia Baetica*
23. *Aristida Purpurea*
24. *Aristida Caerulescens*



STATE OF THE ART



AFTER PROJECT



asphalt / concrete

impermeable surfaces

paved

water

green surfaces

permeable surfaces

CREDITS

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pp. 238-239 / The tall buildings landscape in the Martiricos district in Málaga. The splint buildings function as stages setting that block the views on what there is behind. Photo: personal

pp. 240-241 / The iconic building, headquarters of the newspaper *Diaro del Sur*, that defines with the stadium the north limit of the Martiricos's system of voids. A large portal ensures a visual connection (potentially also physical) with the nothern parts of cities. Photo: personal

pp. 242-243 / The *Rosaleda* stadium that define the north limit of the Martiricos's system of voids. On the ground floor there are long arcades on the sides of the building. Photo: personal

p. 247 / Map of the voids archipelago in relation to the Guadalmedina River. Source: personal drawing

p. 249 / Oswald Mathias Ungers, *Berlin as a green archipelago*. The project is one of the most iconic examples of the idea of city as an archipelago. Source: Oswald Mathias Ungers, Rem Koolhaas, *The City in the City – Berlin: A Green Archipelago*, Lars Müller Publisher, 1977.

pp. 250-251 / The Martiricos's series of void detected for the project development. Source: personal drawing

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p. 263 / Massimo Vitali, *Picnic Allée*, Paris, 2000. Photo: Massimo Vitali

pp. 265-269, 273-279, 283-287, 291-295 / Physical model representing the way to live inside the Active Strips in relation to the climate considerations. Photo: personal

p. 271 / Bernardo Secchi Paola Viganò, *Theatreplein*, Antwerp, 2008. Photo: Teresa Cos

p. 281 / Jeppe Hein, *Appearing Rooms*, Passariano, 2004. Photo: Jeppe Hein

p. 289 / Office Kersten Geers David Van Severen, *Garden Pavilion*, Venice, 2010. Photo: Bas Princen

p. 298 / OMA, *Ville Nouvelle Melun Senart*, Melun, 1987. Source: www.oma.com

p. 301 / Concept of the different layers used in the design process. Source: personal drawing

pp. 302-303 / Masterplan, state of fact and project. Source: personal drawing

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p. 307, 309 / Concept diagrams: mobility, built alignments, funcional mixitè, cultural network. Source: personal drawing

pp. 310-323 / Focus of the different urban situations created with the project. Way to live the public space in relation to the climate considerations. Source: personal drawing

pp. 324-325 / Axonometric view of the project area. Source: personal drawing

p. 329 / Study of the main plant species typical of the territory of Málaga. Source: Málaga ciudad genial, *Guida Málaga. Natura Viva*, Ayuntamento de Málaga, 2018

pp. 330-331 / Masterplan of the project of soils. Current situation and after project. Source: personal drawing

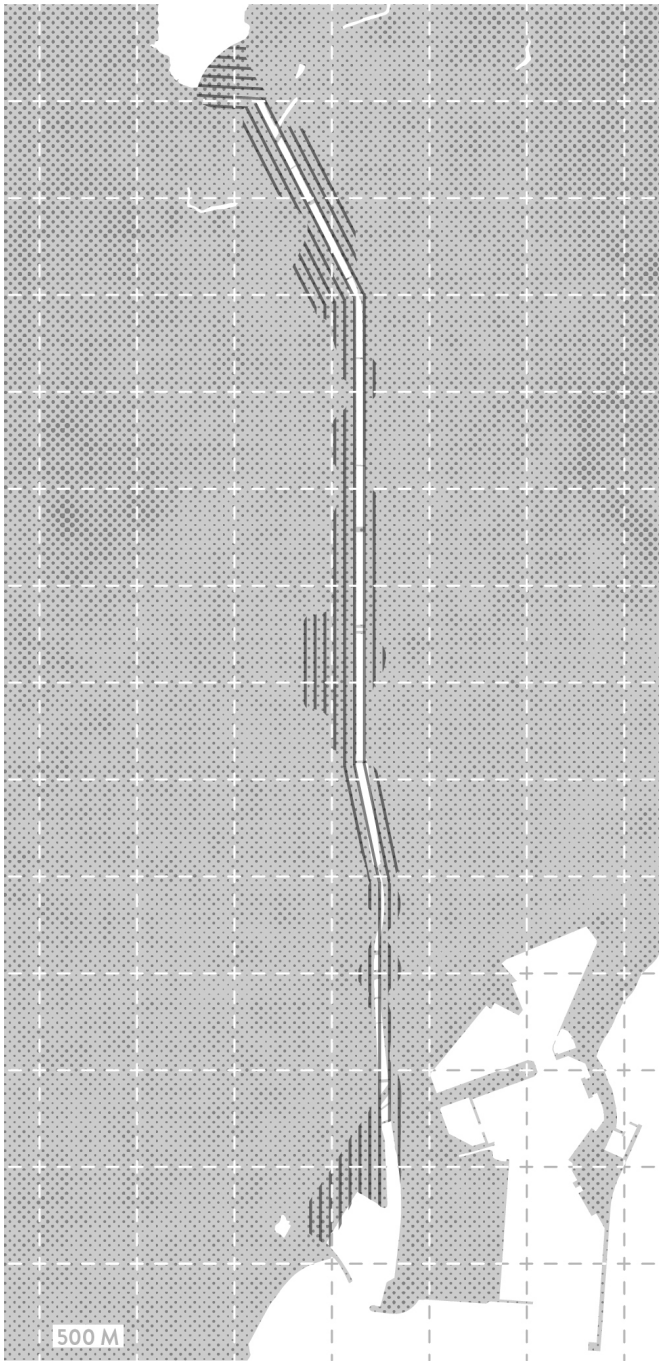
06

REFLECTIONS

The conclusion of this thesis work cannot be a conclusion. The issue of climate change, especially when addressed in relation to the opportunities of architectural and urban design, is in fact so broad and full of facets that thinking of being able to put an end would be nothing short of reductive. On the other hand, it is possible to elaborate some reflections resulting from the research work as much as from the final design effort.

First of all it must be said that the design strategy identified for the system of voids of Martiricos constitutes an approach that, although potentially repeatable throughout the urban stretch of Guadalmedina, according to the different pre-existing characteristics in the different contexts that the route of the river meets, is designed specifically for this part of the city of Málaga. It would not make sense, in this regard, to replicate it in other parts of the city nor in different cities, since it constitutes the realization of a long process of research and analysis around a specific place,

ACTIVE STRIPS AS A POSSIBLE REPEATABLE STRATEGY ALONG THE GUADALMEDINA



which takes into account its form as well as its history and its cultural importance. However, the approach used to draw up such a project strategy is, on the contrary, shareable and repeatable in every context and, for this reason, constitutes the true value of this work. The objective of this research, in fact, has never been the project itself (although it is a fundamental moment within the process that allows to concretize the ideas and strategies identified at the theoretical level); instead, it is the definition of a different approach to climate change in relation to the architectural and urban environment. The result, therefore, is not to have designed a potential design solution for the Málaga riverside, but rather to have shown that it is possible to look at climate change from another point of view, that is as an opportunity for the project, rethinking the public space of cities without ever losing contact with the historical and cultural connotations of a place or the subjective point of view of the people who will live such spaces.



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