Miquel Barceló

INNOVATION DISTRICTS

Designing and implementing the transformation of the 21st-century city



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To my parents

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PRESENTATION

Cities of the 21st century are in the process of transitioning from a 20th-century model, which is typical of the second industrial revolution and based on urban planning that divides the land according to specialised purposes, separating areas of residential use from those of economic activities. The urban plan, productive model and mobility model of these cities are based on the technology of the 20th century; a design which is now proving to be unsustainable and leading to the irreversible economic and social decline of cities that do not undergo transformation.

The 21st-century city bases its economic model on knowledge and the creativity of people. Digital technology and globalisation are radically altering the production system that is organised in global value chains. In these conditions, to be competitive, cities need to create urban environments that favour the creativity of people and the innovation of organisations.

These creative and urban innovation environments are known as Innovation Districts. An Innovation District (ID) is an urban area where companies and knowledge centres connect with small companies, start-ups, incubators and accelerators. It is a physical, mixed-use space for housing, offices and services; this being attractive for international talent.

Today cities compete on a global scale to attract talent and competitive investment, and to do so they need to create these urban environments that we call Innovation Districts. The most competitive cities in the world are nodes in the global network of cities and attract the highest value-added investment and talent. For this, it is necessary to design

and develop an urban Innovation District with the characteristics that are stipulated in this book.

In the following pages, an Innovation District model is proposed, based on the observation of cases from around the world and on the author's experience in developing projects in different cities and countries. This model, as an innovation ecosystem, is made up of five interrelated subsystems, which are: urban planning, economic strategy, the knowledge base, social integration, and finally the governance model necessary for the design, development and management of the district.

On the one hand, this book is a text based on the work of other authors, through numerous bibliographical references, taking their ideas not as irrefutable truths, but as leverage to support one's own thinking; On the other hand, it is also a set of proposals based on the author's specific experiences in city transformation projects, the result of collaboration with many people who have participated and continue to participate in these experiences.

The book is divided into three parts: the first part deals with the 21st-century revolution that requires a change in the urban model. The technological revolution entails a change in the economic, energy and mobility model, which leads to the need for a new sustainable city, capable of creating urban environments that are considered to be innovation ecosystems.

The second part is dedicated to the definition of the Innovation District model, with a chapter for each of the five mentioned subsystems. Finally, the third part deals with the relationship between the Innovation District and the city as a whole, as well as the territory and describes some cases of cities in the world that are developing Innovation Districts and transforming their entire urban system. At the end of each chapter, some "key ideas" are presented as a summary of the chapter.

We end the book with a final chapter in the form of a set of guides to help the reader who is considering or is already participating in the development of an Innovation District. It is a practical contribution to the design and development of an Innovation District project, as stated in the subtitle of the book.

The book is aimed at a broad audience, both those from the academic and professional worlds or from public administrations, whose work impacts on the city and who want to understand the new dynamics of cities in a global world. Students and teachers, professionals from the world of urban planning, architecture, engineering or technology, those from sectors of the economic and business world, people related to pub-

lic policies, will all find the concepts and basic criteria for designing, developing and managing an Innovation District in a city in this book.

Many people have helped me write this new book, from my family and friends to various conversations and experiences that have allowed me to reflect on the subject. I would like to show my gratitude to those who have helped me particularly with the comments and opinions mentioned herein. At the risk of forgetting some, to whom I apologise in advance, I would like to highlight the contributions of the urban planners Albert Ibáñez and Sebastià Jornet, the engineers Robert Gili and Ramon Sagarra, Enric Urreta, Isabel Sabadi and Yolanda Treviño from 22 @Network, Ramon Gras from Harvard University, Oriol Pascual from the Stage 2 Accelerator, Julie Wagner from the Global Institute of Innovation District and Nick Coutts from Imperial College London.

My friends Robert Gili and Paco Solé Parellada deserve a special mention, for their patience reviewing the book, and Ramon Gras for his valuable contributions to the chapters dedicated to innovation ecosystems and the relationships between Innovation Districts and the territory. Many thanks to all of them, may we continue collaborating in current and future initiatives.

Miquel Barceló Roca

Barcelona and Sitges, February 2023

PART ONE

THE 21ST-CENTURY REVOLUTION: A CHANGE IN THE URBAN MODEL

The revolution of the 21st century involves a change in the urban model, the result of a change in the economic, energy and mobility model, which leads to the need for a new sustainable city, capable of creating urban environments that are considered to be innovation ecosystems.

In this first part of the book, we will begin by describing the main characteristics of the current technological revolution and we will analyse some of its effects on the modern-day city. To do this, it is necessary to refer to the theory and practice of complex systems as, in order to understand our current reality, it is necessary to "think in systems", and the effects on the change in the urban model.

We will highlight the need, in this new phase of history, to move away from the dispersed city with specialised areas, to a new dense and compact, mixed-use city, that is attractive to international talent. A move towards a new urban model with a compact morphology and a complex organisation, which is both metabolically efficient and socially cohesive.

Finally, we will develop the concept of the innovation ecosystem as an essential element of the new city. An innovation ecosystem is an environment made up of various interrelated organisms and functions whose purpose is to promote innovation, and from this, the economic development of a given territory.

1
A REVOLUTION IN PROGRESS

The new industrial revolution that we are experiencing requires a new vision of the urban phenomenon. This relatively recent phenomenon that we call a city consists of a limited space where millions of people live and interact. Currently, a greater part of the world population resides in cities, exceeding 50% for the first time in the history of humanity and set to exceed 60% in the next few years.

In the city, concepts and disciplines such as urban planning, economy, technology or social change, among many others, coexist and are mutually interrelated through cause-and-effect relationships that configure an increasingly complex urban system.

In this introductory chapter, we will start from the current economic, technological and social revolution that some call the knowledge revolution or fourth industrial revolution and its effects on the city. We will continue with some reflections on the city as a system and its relationship with economic and social change. And finally, we will reflect on the need for systemic urban planning and the important role that innovation ecosystems play and can play within the new city.

1.1. The current revolution and its effects on the city

The rapid development of information and communication technology (ICT) and the phenomenon of globalisation, produce an acceleration of economic growth worldwide, led by a few metropolises, which form a powerful network of cities leading economic, cultural and social change around the world.

According to Peter Karl Kresel (2005), world trade has increased three times more than economic growth since 1950. The number of

multinational corporations went from 7,000 in 1960 to 65,000 in 2005 and it is estimated that they currently exceed 100,000. Over the last few years, a global production system that works 24 hours a day has developed thanks to the massive use of ICT. Currently, any point on Earth can be connected to any other at the speed of light, through fiber optic networks deployed throughout the world.

An example of this phenomenon is the Indian company Infosys, a world leader in information services, created some thirty years ago by seven recently graduated computer science students, who created a global company with their sheer intelligence and enthusiasm; Na Rayama Murthy led the group that worked from home in the city of Bangalore, where the multinational's headquarters are located today, based on an investment of $250, lent by his wife.

From these humble beginnings, Infosys managed to become one of today's largest multinational companies in the world in the ICT sector, with its main business base in the United States, where it supplies large business corporations, as well as in the European continent.

Cases such as that of Infosys show that technology is a factor that is accessible throughout the world and shows how a company from a developing country can serve industries in other countries through the use and exploitation of information technology.

The globalisation-technology relationship facilitates this increase in the complexity of the current economic system, meaning that we act in a local society, but globalisation affects us directly. The economy is developing through various established theories, and, at the same time, technology is evolving exponentially, transforming the global economy. We have difficulties however in bridging the gap between economy and technology and new disciplines are required to connect them, to come to understand this complexity.

Within the processes of change that we are analysing, from the first industrial revolution to the current knowledge revolution, we observe that, for reasons that we still do not fully understand, a certain variable suddenly begins to grow more than others. The variables that characterised previous industrial revolutions were the urban population, productivity and gross domestic product; currently they are the number of multinationals, world trade or the number and capacity of computers.

In the global economy, exponential processes are revealed that can be framed within the concept of the "exponential economy", a term coined by Curtis Carlson in his book *Innovation*. The exponen-

tial economy is closely related to the knowledge-based economy and globalisation. In fact, the former is the result of the development of the latter two. It includes those parts of the economy that evolve with exponential growth rates, such as computers, telecommunications, biotechnology or consumer products, among others.

A linear function is represented on a graph by a straight line, in the form of $y = ax$, while an increasing exponential function could follow, for example, the formula $y = ax2$. Intuitively, a linear function would be one that progresses over time with a sequence 1, 2, 3, 4, 5, 6... while an exponential one could correspond to 1, 2, 4, 8, 16, 32... At point 6 the first would have a value of 6, while the second would have a value of 32. Many exponential functions are observed in the digital economy, which represents a cultural change that is difficult to understand in the midst of a transition like the one we are currently experiencing.

A clear example of this exponential economy is seen in the field of computers, in accordance with Moore's law. According to this law, the capacity of integrated circuits has doubled every year and a half since the 1960s. Other segments of the economy are joining the exponential growth club, such as communications, new media or medical technology, not to mention the many activities related to using the Internet. However, it is not easy to understand the mechanisms at play in these activities which result in exponential growth.



Figure 1.1. Photo of Moore's law, model of the first transistor and the first "chip" with a million transistors.

This type of development is common today in various knowledge-based activities, with intensive use of information technology. What's more, they are increasingly interrelated. For example, nanotechnology, materials and mechanics, or nanotechnology, bioinformatics and biotechnology. They are processes with exponential growth that represent future nuclei of new emerging sectors.

Samir Ismail, in his book *Exponential Organizations* (2014), highlights the emergence of companies that base their growth on exponential technologies and functions, which are capable of accelerating their growth through information-related technologies. Ismail defines the ExO model as that of those companies capable of moving from the linear or incremental growth mode, typical of traditional companies, to exponential growth based on the intelligent use of technologies that are now grouped under the name Industry 4.0. In his book, Samir Ismail illustrates the phenomenon of ExOs with a large number of cases, and also proposes a model to create and manage this type of organisation.

A factor related to exponential functions is complexity. Primitive societies were simpler compared to today's society. If we observe our environment, we will realise that there is a general trend towards an increase in complexity: the problems faced by society, personal relationships, professional challenges, are more and more difficult to understand and deal with. The constant changes that we are experiencing require considerable adaptability in the face of the new, the unknown, the uncertain. Complexity is closely related to uncertainty.

Zygmunt Bauman, the eminent Polish sociologist and philosopher, in his book *44 letters from the liquid modern world*, introduces this idea in the following way: *"[…] the behaviour of complex systems with numerous mutually independent variables is and always will be, in a word, unpredictable. Not only unpredictable for us, due to our ignorance, negligence or lack of insight, but also due to the very nature of these systems. […] The future is unpredictable because it is, purely and simply, indeterminate."*

Using a physics analogy, the second law of thermodynamics states that the universe increases in complexity through the concept of entropy, which is a measure of the disorder of matter and energy. Entropy measures the degree of disorder possessed by the molecules that make up a body or the degree of irreversibility achieved after a process that involves energy transformation. The measure of complexity increases as a natural variable in the universe.

What we observe in nature is also taking place in the economy and society. From productive structures to personal relationships, through organisations or the political-administrative framework, modern societies present a much greater degree of complexity than a hundred or even just twenty years ago. What is more, this is a growing trend that does not look set to slow down in the future. In addition, the crisis in which we are currently immersed reveals profound systemic changes, values and ways of doing things that have, until now, been viable. In the field of communication, for example, the rules of the game have completely changed. The simple sender-receiver communication chain controlled by corporations and the mass media has been fundamentally altered with the arrival of the Internet, giving consumers power they previously lacked. They are interconnected consumers, holders of more information and producers of their own content. In this complex context, there are some new rules: transparency, democracy and the power of the citizens, and some risk, such as the control of individual freedom and privacy from the state or large corporations.

All of this results in greater difficulty in understanding the reality in which we live, with the consequent effects on a personal level. Richard Sennett already pointed this out in his book *The Corrosion of Character* (1999), affirming that contemporary society corrodes personal character, causes marginalisation and other forms of psychological and social disorder.

Understanding current reality is increasingly difficult due to the growing number of variables involved, the speed at which they change, the global stage on which they operate and the amount of information available. In this context, understanding the city, as a natural setting in which this complexity plays out, requires new tools that help with decision-making, it requires systems thinking.

Globalisation

Globalisation, technological change and the new knowledge economy are relevant aspects of the new complexity. Globalisation accelerates the economic system as a whole and overrides the logic of national and regional markets. It transforms production systems into global value chains, permitting the entry of new agents and business models that must be more open and prepared to seek partners and

allies. Markets are being liberalised at all levels (national, regional and global), and this means greater competitiveness and speed of change and, as Thomas Piketty (2020) reminds us, also greater inequality. Therefore, the new production system is structured on a planetary scale through the new networked economy, while national governments are losing power in the face of what is referred to as the "network society". Within this framework, there is a substantial increase in production and international trade that goes hand in hand with the movement of capital, also on a global scale.

Apart from these economic aspects, globalisation has other social and cultural nuances such as anti-globalisation movements, migration, growth phenomena as seen in countries like China and India and the associated cultural changes. While these issues are undoubtedly of great significance, we shall not deal with them in depth as our focus is the field of economics and technology.

With globalisation, world markets have an increasingly considerable influence on decisions made by companies and on organisations as a whole. The industrial revolution also implied a process of internationalisation and a phase of greater interrelation between the various world economies. However, now, with networked economies, and thanks to internet technology, the process has gone up a notch. Not only do exchanges take place on a global level, but the production system itself works in an integrated manner through connected networks, increasing the complexity of the system.

In the context of such accelerated technological change, exponential functions and organisations, the globalisation process and the general increase in the complexity of the different economic, cultural and social systems, we must ask ourselves how all of this affects this complex organisation that we call the city, as well as considering its current and future trends and how we can operate in the different interrelated variables and disciplines, at the service of people's happiness and their material and emotional well-being.

1.2. Complex systems and change of the urban model

Donella Meadows (2008) defines a system as "a set of things, people, cells, molecules, or whatever interconnected in such a way that they produce their own pattern of behavior over time." She adds that a system responds to external forces in a way that is characteristic of

this system and that it does not normally do so in a straightforward way. She hereby introduces the concept of complexity in systems analysis, a characteristic that we will see later.

A typical element of industrial culture thus far has been the instrumental approach for the analysis and treatment of a certain challenge, problem or need. Faced with a specific demand, we have sought an instrumental response based on the simple problem-solution relationship. This has allowed us to experience the greatest phase of economic development in the history of humanity, the 20th century. Having said that, it has also probably hindered our ability to analyse, understand and operate within complexity.

Meadows introduces us to complex systems and states that "we are complex systems...every person we meet, every organisation, every animal, garden, tree, and forest is a complex system." The city is also a complex system made up of a set of interconnected elements and functions that result in a behaviour model that evolves over time.

For the analysis of this urban system as a complex system, and to operate within it, we must move from an instrumental vision to a systemic approach and for this it will be useful to consider some elements of systems thinking.

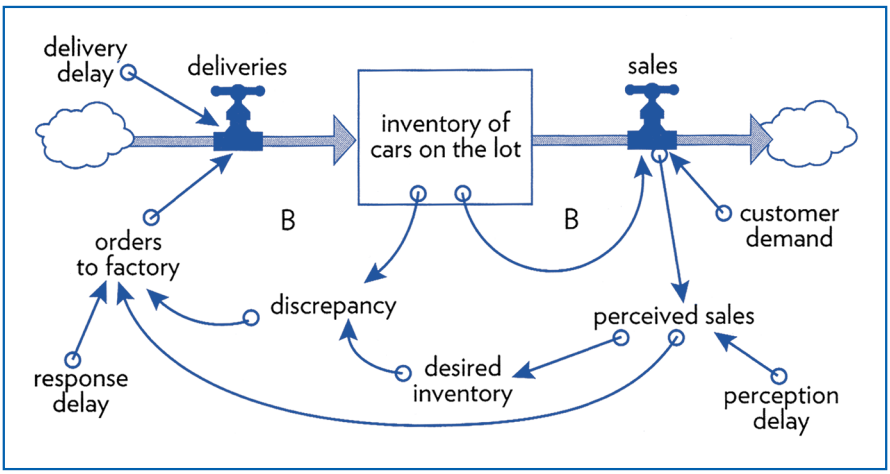


Figure 1.2. Feedback loop graph by D. Meadows.

The first problem that Meadows highlights for systems thinking is that we think in words, but the words are arranged sequentially,

one after the other, forming sentences. Contrary to this, systems occur simultaneously, with each element of a system changing and interacting with the others, all at the same time. That is why spoken and written language has its limitations and graphic forms of representation are more suitable when dealing with systems. Meadows solves this methodological problem by using feedback loops and develops her systems theory by classifying and analysing these feedback loops.

To illustrate the concept of a system, Meadows reminds us of the story of the elephant and the blind men. The parable takes place in a city in which all the inhabitants are blind. One day the King arrives with his army and an elephant. They all want to "see" the elephant, an animal they have never seen but they imagine to be really extraordinary, so they decide that each person can touch one part and then together imagine what this great animal is like. The one who touches the ear says: "it's a big, rough thing, wide like a carpet". The one who touches the trunk says, "It's like a long empty tube, horrible and destructive." The one who finds a foot and a leg says: "it's powerful and firm, like a column." Each one describes the part of the elephant that they have touched, and they all give an incorrect description of the animal. It is neither a rug nor a tube nor a column. It is an animal, that is, a complex system made up of many interrelated parts.

Meadows suggest the following moral of this story: "The behaviour of a system cannot be known, only by knowing the parts it is made up of."

In the same way, it is not possible to know the behaviour of an urban system only by knowing each of its elements. We must think in a system, maintaining a simultaneous vision of the whole and of the relationships between the parts that make up the whole. In this sense, the instrumental culture and the specialisation that has been instilled in us from the first two industrial revolutions of the 19th and 20th centuries make it difficult for us to understand the phenomenon of the city, and this difficulty should be taken into account when working on the city.

On an institutional level, this difficulty occurs, for example, in two areas: the education system and public administrations. In the first, starting in secondary education and later in university and professional training, we specialise knowledge, we train specialists in something specific, but they tend to be unaware of much else. On the

one hand, architects and urban planners, on the other, technologists of different specialties, psychologists, philosophers, agricultural engineers, teachers, etc. Each one in their own world of knowledge and yet disconnected from the others. Each one with their teachers who are great specialists in their subject but very few contributing transversal knowledge or systemic visions.

On the other hand, in organisations in general, but especially in governments, each minister or councillor controls an area and protectively guards his or her territory. The person in charge of urban planning knows little about economic strategy and vice versa; when they are part of different parties or groups, the gaps between them often become war trenches. As a result, we experience significant difficulty in generating policies that connect with the reality of the situation, which is invariably systemic.

The new reality of the 21st century, made up of increasingly complex societies, requires a revolution at least in terms of education and in government structures, as well as in other areas of civil society or the business world. We must be able to introduce systems thinking in our personal culture and in all organisations through transversal approaches and structures that have a comprehensive and systemic vision of the different processes of all kinds that take place in the city.

Characteristics of a complex system

In order to gain a deeper understanding of a complex system and to be able to operate within it, Meadows (2008) poses the question: why do systems work so well? In order to answer this question, she defines the properties of a system and specifically highlights three: resilience, self-organisation and hierarchy.

Resilience is a system's capacity to return to its initial position after experiencing strong pressure that moves it from its previous position. A case in point would be the Covid 19 pandemic. To what extent have we favoured the resilience of our cities and our society? Resilience is the measure of a system's capacity to survive major changes in its environment. The presence and action of feedback loops that contribute to the recovery of the system defines a resilient system compared to a non-resilient one. In this sense, Meadows underlines the importance of incorporating feedback loops into the system that

can: learn from experience, create, design and evolve towards more complex structures that reinforce this property of the system in question.

Self-organisation is a system's ability to increase the complexity of its structure; this means applying the second principle of thermodynamics to different systems, including the urban system. This ability to self-organise by increasing the complexity of a system's structure became clear especially during the first two industrial revolutions. Within a few years, the new idea of burning coal to generate steam and transforming it into mechanical energy meant that industrial societies were able to organise a whole new production system with a highly sophisticated organisation that radically transformed society and brought the economy, culture and political power of the city to a pivotal point.

The new urban system is endowed with new organisational structures, in line with the logic of technological change and economic change, greatly increasing their complexity.

This same process was repeated on a larger scale with the ability to burn other fossil fuels, petroleum derivatives, inside an internal combustion engine; thus, a new mobility model appeared, productivity increased through mass production plants and a new energy model based on electricity was invented and its use widespread.

Technological change, which highlights society's capacity for self-organisation, increases the complexity of the social system and the urban system.

Hierarchy is a self-organising system, where there is dynamic tension between organisation and hierarchy. New forms of organisation require freedom and the ability to experiment with new structures, but this comes up against pre-existing hierarchies which limit them. New power structures are created which curb freedom of decision and establish a new dynamic of the system as a whole.

Economic policies that emerge from the new hierarchical structures tend to reinforce the status quo and the power of large organisations, rather than the creation of new, emergent realities. Governments are generally more comfortable with a passive and disorganised society than with self-organised groups defending their ideas.

Often the space where this confrontation or social dynamic takes place is in the city, the city as the scene of an increasingly complex social dynamic due to the relationship between self-organisation and

hierarchy. In order to understand the city as an urban system, we need to delve deeper into the logic of *System Dynamics*, as follows.

By applying three properties of system dynamics to urban systems we are able to analyse their nature and behaviour in situations of change, such as those we are currently experiencing in terms of the health crisis and the crisis of the development model, as well as their direct application to the 21st-century city model. As we will see more on this subject later on, for now we will just give a brief overview of the dynamics of complex systems.

The father of general systems theory, the German biologist Ludwig von Bertalanffy, defined it as: "a complex of mutually interacting elements". He thus emphasises two elements: he distinguishes between the parts and the whole and emphasises the interaction of the parts that make up the whole, i.e., the system. Focussing on the dynamics of interaction of the parts and their interdependence represents the key difference in this vision. We are moving from a world composed of the sum of parts (instrumental vision) to a new vision that emphasises interactions and interdependencies (systemic vision).

The work of the MIT Sloan School of Management group, which culminated in the first Club of Rome report "The Limits to Growth", established a model for the sustainable development of societies, countries and cities. Today, this development model is widely accepted in light of the clear signals that climate change is sending us with increasing frequency and intensity.

Donella Meadows led the publication of the First Report of the Club of Rome in 1972, 50 years ago last year, which was a major wake-up call to humanity on what we now know as the threat of climate change. Donella Meadows was a person who was ahead of her time and who deserves a tribute from all humanity.

Complex systems with an infinite number of interrelated variables, like most social systems and particularly the urban system we are studying, require modelling that will necessarily imply simplification of the system that makes it possible to operate within it in a practical way, even at the risk of omitting some elements and some relationships that could be taken into account.

The main characteristic of an urban system, to sum up, is a set of interrelated elements with a common purpose. We have also seen that, like any system, it has three characteristics: resilience, self-or-

ganisation and hierarchy. The city is a living being that knows how to recover, adapt or react to crises of all kinds, evolving towards new forms of organisation; the city is capable of self-organisation through interrelated social groups, institutions and entities, and in the city, there is a system of hierarchies that dynamically counterbalances its capacity for self-organisation.

But in the city, following the aforementioned story of the elephant, there are often situations in which its components act blindly, mistaking the separate parts for the whole. The specialisation and segregation of some elements of the urban system leads to a misunderstanding of the complexity of the whole. On the other hand, the dominance of institutional hierarchy or interest groups slows down the process of adaptation to a new context, resulting in inertia and meaning that outdated structures are maintained without the capacity to react, since the resilience of the system as a whole has been neutralised.

And this is what is happening today: **technological change and the resulting change in the economic model are of such magnitude that the current city, as a system, generally has serious difficulties in reacting to a new stage in a way that is in line with the new environmental conditions.**

The introduction to systems theory helps us to analyse the modern city as an urban system in light of some of the contributions of illustrious urbanists such as Jane Jacobs. Most of us mortals are not able to think in systems in a natural way, at most we understand a simple cause and effect relationship and use it in our daily lives. However, some privileged minds such as those of Einstein, Newton or Aristotle were natural systems thinkers. I believe that one of these privileged people was the great American urban planner Jane Jacobs who left us her brilliant work on the urban system "The Death and Life of Great American Cities" (2011).

Jacobs presents us with cities functioning based on what she calls "common and ordinary things", which is the life of the people. The urban system based on planning that serves the lives of the people who live in the city. She attacks the principles and aims, that, in her view, "have shaped modern, orthodox urban planning and urban reconstruction". The first edition of the book was published in 1961, in the midst of post-war economic development and the absolute dominance of the automobile as a means of individual and family transport. This led, especially in New York and in most American cities, to

urban planning based on specialised use and became a predator of territory, and to the consequent construction of large road infrastructures that radically transformed the city. Jacobs reacts against this model of the city, which, moreover, forms part of the dominant ideology resulting from the economic and technological system prevailing at the time.

Jacobs represents a paradox in that her criticism of a city resulting from a dominant economic model actually lays the foundations for the modern city of the 21st century with a technological and economic model that is radically different from the one the author lived in. She was a brilliant thinker who was ahead of her time, putting forward some ideas that we would do well to recover in the new city that the 21st century needs and which we suggest in this book.

At the time when Jane Jacobs was active in leading alternative social movements to the prevailing official urbanism in New York City, the dominant ideology was monopolised by an economic system based on Taylorism and Fordism, synonymous with large-scale industrial production, with a growing domestic demand that absorbed all the production that the industrial economic system of the second half of the 20th century was capable of providing.

The growing middle class had gained access to stable jobs with incomes that allowed them to aspire to material goods that the previous generation had only known briefly, given the two world wars and the recession of the 1930s that had dominated the first half of the 20th century. This was the era of developmentalism, families aspired to own their first car and could get into debt by buying a detached house in the suburbs. A family car and a house with a garden were the great aspirations of millions and millions of people in the United States and Western Europe. They were the symbol of the American dream.

At this historical moment, Jane Jacobs proposed a human scale urban plan, based on collective life in neighbourhoods, where people relate to each other and establish bonds of trust that are the fundamental basis for security in the city. In her model of the city, Jacobs defends the compatibility between security and privacy, and for this it is necessary to create spaces for socialisation and encounters that create links between people.

It is the friendly city with neighbourhoods where people know each other and establish relationships that create a sense of belonging

to a community. It is about creating shared public space, especially through wide pavements and small blocks with many corners and shops on the ground floor, with a mix of uses that bring these neighbourhoods to life all day and every day of the week. This is the new dense and compact city to which we will return in chapter 2, and which went against the dominant ideology of the historical moment in which Jane Jacobs lived.

1.3. The urban system and social change

We are in the midst of a technological revolution, and therefore also an economic and cultural one, and we must think about its effects on the 21st-century city, which will be quite different from the one we have known and lived in until today. The new form of urbanism that we propose in this book must have a systemic vision which is applied to the city's urban planning and management.

This radical change that we are experiencing implies important effects on society. The social change that is foreseen can evolve in the positive sense of greater equality and social cohesion or, on the contrary, in the way that is being observed in many cities around the world, towards greater inequality between the different social classes and urban phenomena such as "gentrification", which we will deal with in the following chapters.

Based on the fundamental principles of systems thinking outlined in the previous pages, we will propose some basic points to be taken into account when applied to specific social problems, decision making and strategic planning in urban environments such as the one we are discussing, which is undergoing a rapid process of model transformation. The aim is that, in designing and developing the new city of the 21st century, where innovation and knowledge must play a fundamental role, we do not have negative effects in terms of equity and social cohesion and, on the contrary, we take advantage of the enormous potential for social innovation for the benefit of all the city's inhabitants.

We often observe that, despite the fact that states and local governments devote a lot of resources to solving situations of social marginalisation of people, groups and neighbourhoods, these policies do not achieve the expected results. According to various authors, the reasons for these failures are as follows: