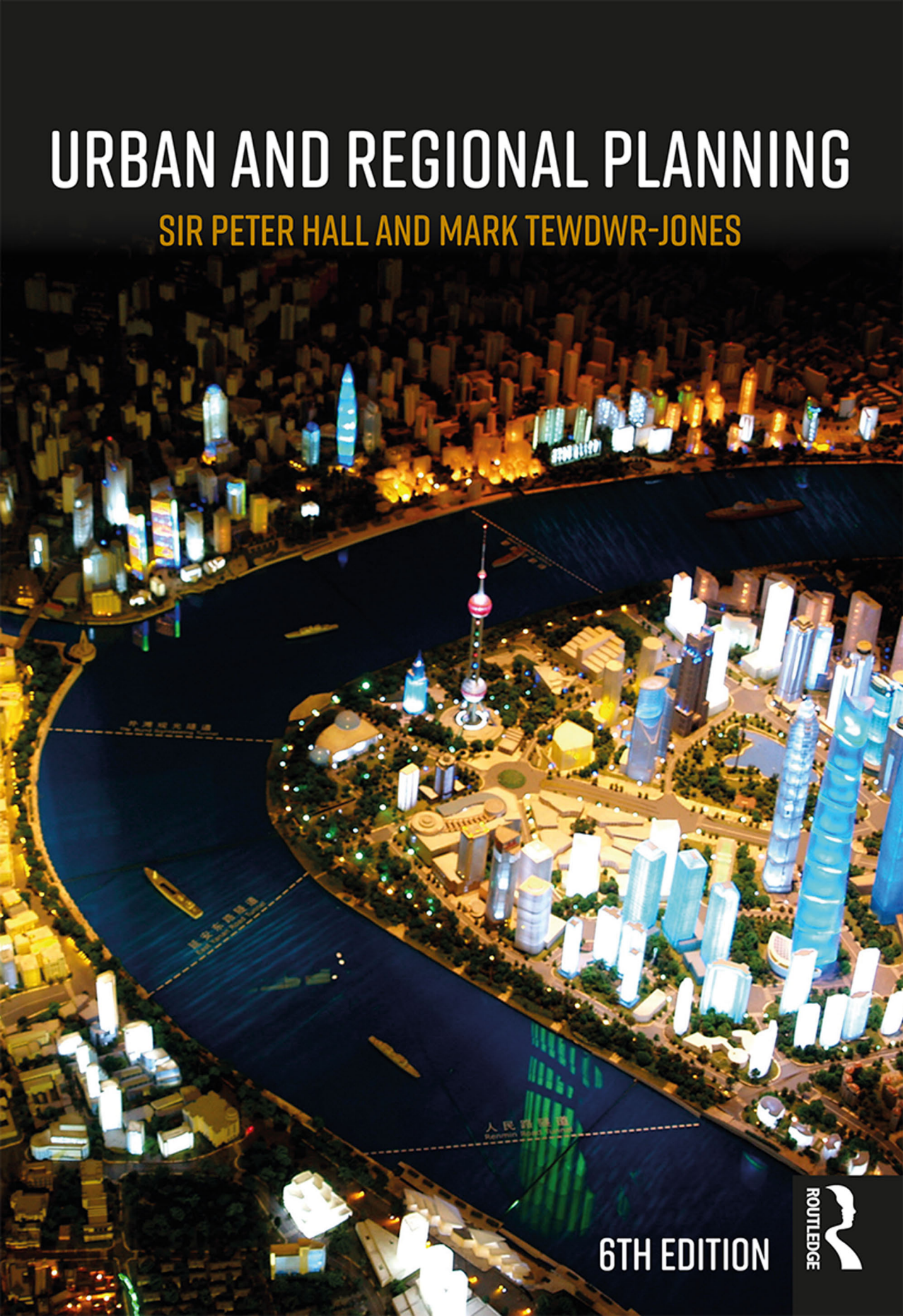
URBAN AND REGIONAL PLANNING

SIR PETER HALL AND MARK TEWDWR-JONES



6TH EDITION

ROUTLEDGE

Urban and Regional Planning

This is the sixth edition of the classic text for students of geography and urban and regional planning. It gives an historical overview of the changes in cities and regions and in the development of the theory and practice of planning throughout the 20th and 21st centuries.

The extensively revised edition now incorporates new material on European issues, as well as updated country-specific sections and considers the impacts of recession. Specific references are made to the most important British developments in recent times, including new towns, neo-liberalism, the devolution to Scotland, Wales and Northern Ireland, and to cities and combined authorities, the role of infrastructure and high-speed rail, the impact of austerity, neighbourhood planning, Brexit and the continual story of the north–south divide. A chapter on United States planning discusses the continuing trends of urban dispersal and social polarisation, the treatment of climate change, the rise of edge cities and the decline of rustbelt cities, as well as initiatives in new urbanism, land use planning and transportation policies. Finally, the book looks to discuss the main issues that are likely to impact on future forms of planning in the 2020s, including digitisation, automation, sustainability and social polarisation.

Urban and Regional Planning will be invaluable to undergraduate as well as postgraduate Planning students. It will prove useful in a variety of built environment areas such as Architecture, Landscape Architecture, Urban Design, and Real Estate, where planning is taught.

Sir Peter Hall was Professor of Planning and Regeneration at the Bartlett School of Planning, University College London.

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Urban and Regional Planning

Sixth edition

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Preface

It is important to stress what this book is and what it is not. Professor Sir Peter Hall always maintained that this is not a textbook of planning, pointing to a number of excellent examples of planning textbooks now available, including especially Barry Cullingworth's classic *Town and Country Planning in the UK* (now in its 15th edition, with Vincent Nadin *et al*.; Routledge, 2015). Rather, Peter maintained that *Urban and Regional Planning* is an introduction to planning, a primer, written both for the beginning student and for the general reader. The first edition was published in 1975; over 45 years later, and over five years since Peter's death, I hope the book will still be found useful by students of applied geography and of urban and regional planning; by university and college students concerned to understand historic and contemporary urban and regional change, and planning's role in that story; and by a wider audience which may want to know how and what planning is and how it has evolved.

It is somewhat telling that the 1975 edition, even the 2002 fourth edition of the book, may now be regarded as historical accounts of urban and regional planning, even though they were written as contemporary accounts. What is telling over the last 45 years, and reflects planning's fortunes over this time, is that the nature of some urban and regional problems never really go away; the degree of their relevance, and the way they transform cities and regions globally, are dependent on a range of political, governmental and planning contexts, as well as more fundamental economic, social, environmental and technological forces. There is some degree of continuity in examining regional economic flows, of growing and declining regions, of uneven development, of economic and political crises, of the drivers of change, of the need for new infrastructure or new housing, or the needs of disadvantaged groups in urban societies. And we can learn from historic accounts of how these issues were understood and dealt with historically, through a changing and changeable government and governance structure, and a planning system that – essentially – finds it difficult to keep up with constant flows. This, above all, is the hallmark of both urban and regional planning, and the enduring themes addressed throughout this book.

Two points must be made about how these subjects are treated. First, of course, the book is deliberately historical; it traces the evolution of urban and regional problems, and of planning philosophies, techniques and legislation, from the Industrial Revolution to the present day. Second, it is necessarily written from a British standpoint for a British readership, but an international readership should find it relevant for the degree to which contemporary problems in other nations have some parallels with the British experience. Throughout most of the book the exclusive emphasis is on the British experience, though the survey of early planning thought in Chapter 2 is international, and Chapters 7 and 8 deliberately range out to compare the experience of other advanced industrial countries. Even in those chapters the comparison deliberately excludes the Global South; doubtless,

another useful book is to be written there, but there is no space in this book to do the subject justice.

The book is a by-product of a combined 60 years of lectures on introductory applied geography and planning at the London School of Economics, the University of Reading, the University of California at Berkeley (PH), and at Cardiff University, the University of Aberdeen, Newcastle University (MTJ), and given by Peter and I at University College London in the 2000s. We are grateful to successive waves of students who endured these modules and who unfailingly, by their reactions, indicated the places where material was boring or unintelligible. I am indebted to colleagues who have provided relevant material to consider for inclusion in the book, especially D. Michael Ray and Dan O'Donaghue for updates to the tables in Chapter 5. But I must add the usual disclaimer: that for errors and omissions, I am solely responsible.

Last, Peter had dedicated the first and subsequent editions of the book to his wife Magda, for – in his words – 'her imperturbable patience in the face of gross provocation in the hope that she will find the result some small recompense for many delayed dinners and obsessed weekends'. I am delighted to carry on that tradition and also dedicate this, the sixth edition, to Magda.

Mark Tewdwr-Jones
London, April 2019

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1 Planning, planners and plans

Planning, the subject matter of this book, is an extremely ambiguous and difficult word to define. Planners of all kinds think that they know what it means; it refers to the work they do. The difficulty is that they do all sorts of different things, and so they mean different things by the word; planning seems to be all things to all people. We need to start by defining what exactly we are discussing.

The reference in the dictionary gives one clue to the confusion. Whether you go to the Oxford English Dictionary or the American Webster, there you find that the noun 'plan' and the verb 'to plan' have several distinct meanings. In particular, the noun can either mean 'a physical representation of something' – as for instance a drawing or a map; or it can mean 'a method for doing something'; or 'an orderly arrangement of parts of an objective'. The first meaning, in particular, is quite different from the others: when we talk about a street 'plan' of London or New York, we mean something quite different from when we talk about our 'plan' to visit London or New York next year. But there is one definition that combines the others and blurs the distinction, as when we talk about a 'plan' for a new building. This is simultaneously a physical design of that building as it is intended to be, and a guide to realizing our intention to build it. And it is here that the real ambiguity arises.

The verb 'to plan', and the nouns 'planning' and 'planner', that are derived from it, have in fact only the second, general group of meanings: they do not refer to the art of drawing up a physical plan or design on paper. They can mean either 'to arrange the parts of', or 'to realize the achievement of', or, more vaguely, 'to intend'. The most common meaning of 'planning' involves both the first two of these elements: planning is concerned with deliberately achieving some objective, and it proceeds by assembling actions into some orderly sequence. One dictionary definition, in fact, refers to what planning does; the other, to how planning does it.

The trouble arises because, although people realize that planning has this more general meaning, they tend to remember the idea of the plan as a physical representation or design. Thus they imagine that planning must include the preparation of such a design. Now it is true that many types of planning might require a physical design, or might benefit from having one: planning often is used in the production of physical objects, such as cars or aeroplanes or buildings or whole towns, and in these cases a blueprint of the desired product will certainly be needed. But many other types of planning, though they will almost certainly require the production of many symbols on pieces of paper, in the form of words or diagrams, may never involve the production of a single exact physical representation of the entity which is being produced. In more recent years, as planning has changed compared to its origins, a plan may even become an online platform, or a digital urban and regional vision, or a collaborative project.

For instance, the word 'planning' is today applied to many different human activities – in fact, virtually all human activities. One almost certainly needs a plan to make war;

diplomats make contingency plans to keep the peace. We talk about educational planning: that does not mean that every detail of every class has to be planned by some bureaucracy (as happens, by repute, in France), but merely that advance planning is necessary if students are to find classrooms and libraries and teachers when they arrive at a certain age and seek a certain sort of education. We talk about planning the economy to minimise the swings of growth and recession, and reduce the misery of unemployment or austerity or the local impacts of global economic shifts; we hear about a housing plan and a social-services plan. Business now plans on a colossal scale: the production of a new model of a car, or a personal computer, has to be worked out long in advance of its appearance in the shops. And all this is true, whatever the nature of the economic system. Whether labelled free enterprise or social democratic or socialist, no society on earth today provides goods and services for its people, or schools and colleges for its children, without planning. In fact, so routinely do we organize and prepare ourselves for some future activity or event that we may not consciously believe we are planning at all. There have been times over the last century when some individuals might have regretted performing any activity called planning at all; they wish for what is often referred to as a simpler age, when perhaps things happened without forethought, or even a plan-free age, where individuals undertake activities on a pragmatic and incremental basis and deal with the consequences of their actions as they occur, irrespective of impact; those calls for simpler or plan-free ages continue to exist and seem to be in the ascendancy in some nations as we progress through the twenty-first century, according to political and ideological taste. Perhaps it is this, more than any other aspect of change, that has become the enduring hallmark surrounding urban and regional planning: a constant debate as to the merits of performing planning activity and who, if anyone, should have the right to do so.

The reason for employing an activity called planning is the fact of life everybody knows: that modern society is immeasurably more complex, technically and socially, than previous societies. Centuries ago, when education involved the simple repetition of a few well-understood rules which were taught to all, and when books were non-existent, the setting up of a school did not involve much elaborate planning or the training of specialized teachers. The stages of production were simpler; wood was cut in the forest, people wrought it locally into tools, the tools were used by their neighbours, all without much forethought. But today, without elaborate planning, the complex fabric of our material civilisation would begin to crack up: supplies of foodstuffs would disappear, essential water and power supplies would fail, epidemics would rapidly break out. We see these things happening all too readily, after natural or human disasters like earthquakes or wars or unforeseen economic downturns. Though some of us may decide to try to opt out of technological civilisation or social media for a few days, months or even years, the prospect does not seem likely to appeal to twenty-first-century citizens in both the affluent and globalizing worlds. Those in the less affluent world, in particular, are in much less doubt that they want the security and dignity that planning can bring.

The point is that the sorts of planning which we have been discussing above either may not require physical plans at all, in the sense of scale blueprints of physical objects, or may require them only occasionally or incidentally. It is more likely to consist, for the most part, of written statements of intent accompanied by some justification and evidence, usually in the form of tables or figures, or sometimes through urban modelling based on mathematical formulae, or though diagrams and visualizations, or all these things. The emphasis throughout is on tracing an orderly sequence of events that will achieve a predetermined goal. But even here, in a modern world where politicians seem ripe on questioning demonstrable evidence, expert opinion or even facts (and, conversely, promulgate what is sometimes referred to as fake news or fake facts), the very essence of

planning – founded on rational debate and intelligence – is seeing its foundations being shaken increasingly.

Consider educational planning as an example. The goal has first to be fixed. It may be given externally, as a situation which has to be met: to provide education which will meet the expected demands ten years hence. Or there may be a more positive, active goal: to double the numbers of scientists or technologists graduating from the universities, for instance. Whatever the aim, the first step will be a careful projection that leads from the present to the future target date, year by year. It will show the number of students in schools and colleges and the courses that will be needed to meet whatever objective is stated. From this, the implications will be traced in terms of buildings, teachers and materials. There may need to be a crash school-building programme using quickly assembled prefabricated components; a new or a supplementary teacher-training programme, or an attempt to attract people from other professions into teaching; a new series of textbooks or experiments in online web-based learning, all of which in turn will take time to set in motion and produce results. At critical points in the process, alternatives will be faced. Would it be more economical, or more effective, to increase teacher supply or concentrate on a greater supply of teaching material through the internet? Could better use be made of existing buildings by better overall coordination, rather than by putting up new buildings? Ways will need to be found of evaluating these choices. Then, throughout the lifetime of the programme, ways will need to be found of monitoring progress very closely to take account of unexpected failures or divergences from the plan or changes in the situation. In the whole of this complex sequence the only scale models may be the designs of the new schools or of the ICT (information and communication technologies) system and a few other details – a small part of the whole, and one which comes at a late stage in the process, when the broad outlines of the programme are determined.

To summarize, then: planning as a general activity is the making of an orderly sequence of action that will lead to the achievement of a stated goal or goals. Historically, its main techniques have been written statements, perhaps with a medium- to long-term horizon, supplemented as appropriate by visual representations, statistical projections, trend analysis, quantified evaluations and diagrams illustrating relationships between different parts of the plan. These comprise a suite of planning methods, but planning may, although need not necessarily, include exact physical blueprints of objects. One issue to consider before we move forward is that forms of planning will always be needed even if individuals, societies or governments sometimes turn away from formal planning activity.

The application to urban and regional planning

The difficulty now comes when we try to apply this description to the particular sort of planning that is the subject matter of this book: urban and regional planning (or, as it is often still called in the UK legal system at least, town and country planning). In many advanced economies, such as Britain, the United States, Germany or Japan, the phrase ‘urban planning’ or ‘town planning’ is strictly a tautology: since a great majority of the population are classed in the statistics as urban and live in places defined as urban, ‘town planning’ seems simply to mean any sort of planning whatsoever. In fact, as is well known, ‘urban’ planning conventionally means something more limited and precise: it refers to planning with a spatial, or geographical, component, in which the general objective is to provide for a spatial structure of activities (or of land uses) which in some way is better than the pattern existing without planning. Such planning is also known as ‘physical’ planning; ‘spatial’ planning is perhaps a more neutral and more precise term and has been used intermittently alongside urban and regional planning and town planning periodically.

If such planning has a spatial component, then clearly it only makes sense if it culminates in a spatial representation. Whether this is a very precise and detailed map, or the most general schematic diagram, it is to some degree a 'plan' in the first, more precise meaning of the term. In other words, it seems that urban planning (or regional planning) is a special case of general planning, which can include the plan-making, or representational, component.

Broadly, in practice this does prove to be the case. It is simply impossible to think of this type of planning without some spatial representation – without a map or visualization, in other words. And whatever the precise organizational sequence of such planning, in practice it does tend to proceed from very general (and rather diagrammatic) maps or schematics to very precise ones, or blueprints. For the final output of such a process is the act of physical development (or, in some cases, the decision not to develop, but to leave the land as it is). And physical development, in the form of buildings, will require an exact design.

A great deal of discussion and controversy in recent years tends to have obscured this fact. In most countries spatial or urban planning as practised for many years – both before the Second World War and after it – was very minute and detailed: the output tended to consist of very precise large-scale maps showing the exact disposition of all land uses and activities and proposed developments. During the 1960s, the 1980s, and the 2010s, whenever planning has adopted such detailed plans, they have been attacked by people opposing the idea of having a plan: planning, it has been argued, needs to concentrate much more on the broad principles rather than on details; it should stress the process, or time sequence, by which the goal was to be reached, rather than present the desired end-state in detail; it should start from a highly generalized and diagrammatic picture of the spatial distributions at any point of time only filling in the details as they needed to be filled in, bit by bit. This, as we shall see later, is the essential difference in Britain between the form that planning has taken historically, as it has ebbed and flowed between the strategic and detailed, and the local and basic, according to government taste and even planning fashion. Urban and regional planning has never been a static activity, even within one individual nation, nor should it be if it is going to address ongoing sets of problems affecting places. In the UK, for example, the Town and Country Planning Act of 1947 detailed planning provisions were replaced under the Town and Country Planning Act of 1968; the Planning and Compulsory Purchase Act of 2004 strategic spatial planning provisions were replaced by the more localized Localism Act of 2011. New times require new forms of urban and regional planning, and so planning changes.

The central point, though, is that this type of planning is still essentially spatial – whatever the scale and whatever the sequence. It is concerned with the spatial impact of many different kinds of problem, and with the spatial coordination of many different policies. Economists, for instance, are concerned with the broad progress of the economy, usually at national and sometimes at international level: they look at the evolving structure of the economy, in terms of business sectors and occupations, at the combination of the factors of growth which brings forth the flow of goods and services, at the income thus generated and its reconversion into factors of production, and at problems of exchange. Those countries with federal or regional governance will have regional economic planners looking at the same things, but always from the point of view of their particular spatial impact: they consider the effect of the variable, geographical space and distance, on these phenomena. Similarly social planners will be concerned with the needs of the individual and the group; they will be concerned with the changing social structure of the population, with occupational mobility, inclusiveness and exclusion, and its effect on lifestyles and housing patterns, with household and family structure in relation to factors

like health and well-being, age, demography, and occupation and educational background with household income and its variation, with social and psychological factors which lead to individual or family changes. Those concerned with the social aspects of urban planning share the same interests and concerns, but see them always with the spatial component: he or she is concerned, for instance, with the effect of occupational mobility on the inner city – as against the new suburb – on changing household structure as it affects the housing market near the centre of the city, on household income in relation to items like travel cost for the low-income family whose available employment may be migrating to the suburbs.

The relationship between urban and regional planning and the various types of specialized planning, in these examples, is interestingly like the relationship of geography, as an academic subject, to other related social sciences. For geography also has a number of different faces, each of which stresses the spatial relationship in one of these related sciences: economic geography analyses the effect of geographic space and distance on the mechanisms of production, consumption and exchange; social geography similarly examines the spatial impact upon patterns of social relationship; political geography looks at the effect of location upon political actions. One can argue from this that spatial planning, or urban and regional planning, is essentially human geography in these various aspects, harnessed or applied to the positive task of action to achieve a specific objective. The difference between geography and planning can be described, flippantly perhaps, in a single contestable sentence: geographers analyse, and planners do. A good planner should harness both sets of skills, while developing a deep understanding of politics, economics, and history.

Many teachers in planning schools would hotly deny this. They would argue that planning, as they teach it, necessarily includes many aspects that are not commonly taught in geography curricula – even those that stress the applications of the subject. The law relating to the land is one of these; civil engineering is another; civic design is another. This is true, though many would argue – both inside the planning schools, and out – that not all these elements are necessary to the planning curriculum. What does seem true is that the central body of social sciences which relate to geography, and whose spatial aspects are taught as parts of human geography – economics, sociology, politics and anthropology – does form the core of the subject matter of urban and regional planning. By ‘subject matter’ we mean that which is actually planned and those it affects. It is, however, arguable that there is another important element in planning education, not covered in this body of social science: that is the study of the process of planning itself, the way we assume control over physical and human matter, and process it adopts to serve defined ends. According to this distinction ‘planning method’ would be what is common to the education of all kinds of planners – whether educational, economic, military or any other; geography and its related social sciences would constitute the peculiar subject matter of that particular division of planning called urban and regional.

‘Planning’ as an activity

What then would this core of planning education – the study of planning process – comprise? This is a basic question, which after 100 years ought to be the subject of continual intense debate in schools of planning. But curiously, historically, for a long time it was avoided – the reason being, apparently, that planning education was seen as education in making physical plans, not education in planning method. The first people to raise the question seriously were not teachers of physical planning, but teachers of industrial

or corporate planning, in the American business schools. There, down to about 1945, education in management was usually based on a rather narrow spectrum of skills in applied engineering and accounting; the aim was to obtain maximum efficiency in plant operation, both in an engineering sense and in an accounting sense, and little attention was given to the problems of decision-taking in complex situations. But during the 1950s, partly as the result of the work of such fundamental thinkers as Chester Barnard, Peter Drucker and Herbert Simon, management education was transformed. First, it developed into a science of decision-making, which borrowed freely from concepts in philosophy and politics, and second, it harnessed the thinking of a number of social sciences, such as economics, sociology and psychology. It was this new tradition in corporate planning which began, after about 1960, to affect the direction and content of education for physical planning.

By this time, however, management education had further evolved. With the development of computerization in management and planning of all kinds, there was increasing interest in the development of sophisticated control systems which would automatically control machinery. Such systems, of course, were only a development of earlier experiments in automation, which can be dated right back to the origins of the Industrial Revolution; but progress in this field took a big leap forward with the rapid development of more complex computers during the 1950s. Yet even before this, a remarkable original thinker, Norbert Wiener of Harvard, had anticipated the development and much more. In a book published in 1950, *The Human Use of Human Beings*, he had suggested that automation would liberate the human race from the necessity to do mundane tasks. But further, he proposed that the study of automatic control systems was only part of a much larger science of cybernetics,[1] which he defined in the title of a book published in 1948 as the science of 'Control and Communication in the Animal and the Machine'. According to Wiener, animals and especially human beings have long possessed extremely complex communication and control mechanisms – the sort of thing the computer was then replicating. Human societies, Wiener suggested, could be regarded as another manifestation of this need for communication and control.

Thus a new science was born. Rapidly developing in the late 1950s and 1960s, it had a profound influence on research and education in management, and particularly in planning. For if human arrangements could be regarded as complex interrelating systems, they could be paralleled by similar systems of control in the computer, which could then be used to monitor developments and apply appropriate adjustments. Seeing towns and cities as complex systems of systems, developing into a programme for what is sometimes today referred to as 'smart cities', is not a twenty-first century phenomenon.

The best analogy, much quoted at that time for obvious reasons, was manned space flight. In an expedition to the moon most of the adjustments to the spacecraft were made not by the astronauts but by an extraordinarily complex computer-control system on earth at Houston, Texas. Similarly, it is argued, the development of cities and regions could be controlled by a computer which received information about the course of development in a particular area, related this to the objectives which had been laid down by the planners for the development during the next few years and thus produced an appropriate series of adjustments to put the city or the region 'on course' again.

In practice this insight dating from the 1960s has been very useful for the way we think about the physical or spatial planning, and continues to dominate debate on the future of places through the application of digital techniques and advanced urban technology. Information systems and digital smart applications are now used very widely in cities, either through the planning process or else in parallel to them. And, as we shall see in later chapters of this book, it has profoundly affected the way planners think about their job and the way they produce plans. In essence it has led to a swing away from the old

idea of planning as production of blueprints for the future desired state of the area, and towards the new idea of planning as a continuous series of systems and controls over the development of the area, aided by technology, which seek to visualize, model or simulate the process of change and development so that this control can be applied. This in turn has led to a complete change in the sequence of the planner's work.

Formerly, at any time from about 1920 until 1960, the classic sequence taught to all planning students was survey-analysis-plan. (The notion of survey before plan had first been worked out, and taught, by a remarkable British pioneer in planning, Patrick Geddes; his work is discussed in more detail in Chapter 3.) The terms were self-explanatory. First the planner made a survey, in which he or she collected all the relevant information about the development of the city or region. Then she analysed these data, seeking to project them as far as possible into the future to discover how the area was changing and developing. And third, she planned – that is, she made a plan which took into account the facts and interpretations revealed in the survey and analysis, and which sought to harness and control the trends according to principles of sound planning. After a few years – the British Planning Act of 1947 laid down that the period should be every five years – the process should be repeated: the survey should be carried out again to check for new facts and developments, the analysis should be reworked to see how far the projections needed modifying, and the plan should be updated accordingly.

Gradually from the 1960s, a new planning sequence, which replaced this older one as orthodoxy, reflected the approach of cybernated planning. It is more difficult to represent in words because it is a continuous cycle; more commonly, it is represented as a flow diagram. But, to break into the flow for purposes of exposition, it can be said to start with the formulation of goals and objectives for the development of the area concerned (these should be continuously refined and re-defined during the cycles of the planning process). Against this background the planner develops an information system, through data and graphic visualizations, that are continuously updated as the city or region develops and changes. It will be used to produce various alternative projections, or simulations, of the state of the region at past, present and at various future dates, assuming the application of various policies. The aim is always to make this process as flexible and as varied as possible, so that it is possible to look at all sorts of ways of allowing the region to grow and change. Then the alternatives are compared or evaluated against yardsticks derived from the goals and objectives, to produce a recommended system of policy controls that in turn will be modified as the objectives are re-examined and as the system produces data and evidence of new developments. Though it is difficult to put this new sequence into a string of words like the older one, it might be succinctly(!) described as goals-continuous information-projection and simulation of alternative futures-evaluation-choice-continuous monitoring. Something like this sequence, with some differences in words and in ordering, can be found in several important and well-known accounts of the planning process written in the 1960s and early 1970s.

Fast forward to the 2010s and 2020s, and we are witnessing the application of new smarter technology, urban systems computing engineering, apps, and digital tools to manage urban living. The digital revolution is transforming transport use and mobility, public services, consumerism, and even infrastructure and utilities, both as city-wide processes of open access data, service provision and regulation, and as personal human-computer interaction (HCI) through smartphones and other devices. Although these are often portrayed as current ground-breaking shocks or even threats to an existing planning process, they are in effect just more recent incarnations of a continual wave of technological transformation for planning that has been enduring for over 50 years. What is the case, however, is that there have been periods within the last five decades where planning has divorced itself from technological change and retrenched into static plan-making and

regulatory activities; the planning education curriculum has seemingly gone into reverse on occasions by becoming overly concerned with narrow procedures; and smart technological systems and HCI have become academic disciplines and fields of professional employment in themselves, separate to planning. These days, in some countries, we are trying to achieve the realignment of computing science and planning method as a necessary task of managing urban change. We will consider how and why this misalignment occurred later in the book.

Objectives in planning – simple and complex

In practice, as we saw above, having objectives in planning can be an effective improvement. It means that the whole planning process is more clearly articulated, more logical and more explicit. It is obviously better that planners should start with a fairly exhaustive discussion about what they are seeking to achieve and that they should go on having this discussion during the whole planning process. It is better, too, that different alternative scenarios for the future should be developed, so that they can be openly discussed, evaluated and, if necessary, avoided. Dealing with the unpalatable future as much as the desirable future is a necessary planning condition. And the emphasis on specific evaluation, using certain fixed criteria, is an advance. Perhaps as a contradiction, planning has become much more flexible over time, as it works with and assimilates much greater information. So here is the dilemma: can planning embrace pragmatism as it evolves? We would argue that planning with pragmatism gives planning political strength, and the determining characteristic is the degree to which courses of action and outcomes can be justified and rationalized.

Nevertheless, through the decades planning has proved to create many new problems and pitfalls of its own. The development of computer science does not make planning an easier activity – do not let anyone convince you into believing that – in the sense that it somehow becomes more automatic. There may be many automatic aids to smooth out tedious processes, such as detailed calculations; but they do not diminish the area of social and professional responsibility – the responsibility to take decisions that are often politically fraught, strategic, long term, and consequential. For every planning intervention, there will be a need for further intervention down the line; time is the most effective judge of whether decisions are appropriate or not. And fear of taking the wrong decision now (whatever that may be) is no justification for decision takers to avoid taking any decision at all. Although digital technology, data and computer-generated imagery can aid us to understand an urban or regional problem and consider the consequences of different actions, individual human judgement and vision will remain vital in implementation; the basic difficulty is that it is more difficult to apply digital technology to most urban planning problems that, although they are more or less economic or social in nature, have political, democratic and behavioural consequences. Aligning computer science to urban planning completely may be as difficult as sending a person to the moon.

At first sight this may seem absurd: nothing could be more complex than space travel. But this is to mix up levels of complexity. Space travel (or, indeed, commercial aviation) presents many technical problems, but there are two features that make it basically simple. First, the objective is clearly understood. Second, the processes involved are nearly all physical: they are subject to laws of physics, which are much better understood, and which appear to be more regular in their application, than laws of human behaviour. There are human beings involved, of course, but in practice they are reduced to little more than biological units for most of the voyage. The kind of planning that most resembles space travel is transportation planning, and it is significant that this was where computerized

systems planning had its earliest and most successful applications. Elsewhere, it has proved harder. That is because it is inherently more complex. First, the basic objective is not well understood; there is clearly more than one objective, and perhaps dozens (economic growth, fair distribution of income, social cohesion and stability, reduction of climate change threats, greening the environment, life expectancy improvements – the list seems endless). These objectives may not be readily compatible, and may indeed be contradictory. Second, most of the processes which need controlling are human processes, which are less well understood and work with much less certainty than laws in the physical sciences. Anyone who has studied any of the social sciences, such as economics, sociology, psychology or human geography is familiar with this fact. Just as in these sciences we have to work with laws of statistical tendency rather than with laws that are constantly reliable in producing experimental results, so it will be in much of spatial or physical planning.

One point made in the last paragraph is relevant for our understanding of the particular nature of urban and regional planning. Earlier, we said that its method was shared with other sorts of planning activity; its subject matter was distinctively spatial, so that at some time, in some sense, it would produce spatial representations of how activities should be ordered on the ground. We now see that spatial planning, as we are using the term in this book – urban and regional planning, as it is conventionally termed – has another feature: it is multi-dimensional and multi-objective planning. It is necessary to specify these two linked attributes, because there are many types of planning which are 'spatial' in the sense that they are concerned with spatial arrangements on the earth's surface, but have only a single dimension and a single objective. When sanitary engineers consider a sewer plan, their work certainly has a spatial component, but it is neither multi-dimensional nor multi-objective. Or, to be more precise, even if the engineer thinks he/she has more than one objective, these are all engineering objectives within the same basic dimension. This engineer, or colleagues like the highway engineer or telecoms engineer, are doubtless all working with plans that are spatial representations of their territory. But none of them will be trying (for instance) to balance the advantages of preserving a long-established inner city society against the advantages of building better housing on a new development some distance away, or the problem of reconciling rising car ownership with the provision of more efficient and cheaper public transport for those who have limited access to cars and the preservation of a decent urban environment, or the merits of segregating air polluting uses versus the merit of having places of employment nearer to people's homes – all of these, and many more, being considered as part of the same planning process, and having finally each to be considered vis-à-vis all the others. This task of reconciliation is the essence of the job of the urban and regional planner; this is also why, compared with most other jobs, planning is so difficult since these dilemmas constitute what Horst Rittel and Melvin Webber famously referred to as 'wicked problems'.

Planning is difficult in two ways. First, the amount of necessary information and specialized expertise is so much greater than in most other planning activities: it covers almost the whole of human experience. The ideal urban and regional planner would have to be a good economist, sociologist, geographer and designer in his or her own right, as well as having several other necessary physical-scientific skills, such as a good understanding of engineering and computer science. To judge the quality of the information he or she was receiving, they would need to be a sophisticated (and even slightly sceptical) statistician. And they would need to be a highly competent systems analyst in order to develop the relationships with the related computer system. All of which, of course, constitutes an impossible specification – and a daunting task for the educationalist and designer of planning curricula.