URBAN PLANNING AND DEVELOPMENT: ACTORS AND SYSTEM

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FOREWORD

This book endeavours to describe the actors system in urban planning and development regardless of any national context. The urbanization phenomenon is universal but one can object that its institutional environment is particular to each country. Without a doubt. But we have been able to observe, through international comparisons, that countries with market economy, rule of law, private property, and decentralised local governments share a common basic structure. It is this common structure we have tried to highlight through a grid of systemic analysis, assuming that national variations are parameters that don't affect it.

This is a risky task which could seem presumptuous. The necessary simplifications to make a complex reality more easily understood put it at the mercy of critics from specialists in different fields of urbanism. But at the same time everybody can see that dysfunctions in urban societies often originate from the lack of global vision, each issue being dealt with without sufficiently taking into account its side effects on the whole urban system. Systemic approach is therefore neither a luxury nor a researcher's fad.

But we mustn't give the system a reality that it doesn't have. Claude Bernard wrote "Systems are not in nature but in human minds." Systemic analysis is a subjective process to build knowledge out of the real situation and out of the observer's concerns. The latter builds representations of reality in order to find his bearings in the outside world and act on it.

It means that a multitude of different systemic approaches of an object as complex as the city are possible. It is thus conceivable to focus on either urban travels, matter, energy and information flows (the city's metabolism), economy and financial transfers, or social systems. In this book we'll focus on actors that produce urban life's immovable material support: built environment (dwellings and premises), infrastructure and public services, recreational and utilitarian open spaces.

Urban planning and development actors are public (local authorities and government agencies) or private (landowners, developers, production and service companies). We'll turn our attention to these actors' economic and political rationale, to their mutual interactions in order to try to draw out a grid analysis able to help readers to understand the real local urban planning and development system.

This small book is not some academic work. It contains very few bibliographic references. Even if there are vast quantities of papers and articles on urbanism, international comparisons and systemic analyses of planning and development are still scarce. This book is nothing more than an observer's point of view; someone who also takes part through his professional practice and a theoretician who teaches planning and designing urban models[1].

[1] Urbax simulations will be addressed at the end of this book.

CHAPTER 1. URBAN PLANNING AND DEVELOPMENT AS A SYSTEM

A human group comes within the scope of a particular space. An urban society comes within the scope of an urbanised space equipped with infrastructure, public services, public gardens, sport facilities, dwellings and premises.

This « brick and mortar » urbanization is the support of urban life, of its multiple matter, energy, information and money flows. It is the concrete support of its living metabolism as the skeleton is in the human body. In this book we'll focus our attention on the solid built-up environment production and regulation by a sub-system of the urban society that we'll call urban planning and development system. But we won't deal with the functioning of the overall urban society, this issue is too vast to be dealt with through a single perspective.

The city's urban fabric is laid out along streets and public spaces. Those are the "hollow" elements with which "solid" elements (buildings, public services…) are linked. This urban structure is shared by all urban actors. They depend on it. So it cannot be left totally to their own devices. On the contrary, it needs coordination in the interest of all urbanites. Such coordination is implemented by the local authority, whatever legitimacy it has got, either from central government (decentralised local administration) or local elections (decentralised local government).

Urbanization has historically followed two different modes:

- Spontaneously, when constructions are established by individuals along existing roads and rural paths or without any preconceived pattern around an important building such as a church, a monastery or a castle.
- Intentionally, according to a set plan. Such intentional urbanization also applies to existing neighbourhoods that developed spontaneously but need to be restructured for better urban functioning. It may even apply to a formerly intentionally developed area which is to be adapted to new uses, for instance an industrial zone evolving towards housing and services. Implementation of such an intentional urban development must be accompanied by land restructuring, new infrastructure creation, streets and utilities, and public services.

In this first chapter, we'll try to position the planning and development sub-system in connection to the wider urban system. But first we must go off track to look into the notion of the living, biological or social system.

THE NOTION OF LIVING SYSTEM APPLIED TO CITY AND URBANIZATION

A living system is first and foremost a set of interactions that can be isolated from its environment through thinking. The whole structure of the system may be affected by an action on one of its elements, often without us being able to predict all its consequences.

The living system's second feature is the presence of a regulator, i.e. a control centre acting on the system elements to maintain its inner stability and adjust it to environmental variations. The system tends to preserve itself, to ensure its survival. Without this vital desire, the system by definition cannot durably exist. However in a natural system, unlike a social system, the control centre is not individualized. The system spontaneously self-regulates by balancing its components: if the number of predators increases, the quantity of preys decreases and in turn predators' population will diminish as they haven't got enough food. However as the urban system is totally dominated by only one living species, mankind, it cannot self-regulate as a natural ecosystem. Therefore it needs a centralised regulator to function and maintain itself.

In a complex system the control centre can never be sure to achieve at first, through a direct action, the desired outcome. The action's forcefulness can only be approximated since the system, due to its sheer complexity, is moving and uncertain. Regulator's actions produce side-effects that are the result of multiple interactions. Those side-effects, not desired from the start and often random and unpredictable, must in turn be corrected. But those corrections themselves may in turn produce new side-effects. More generally there is no perfect system which, once created, doesn't need regulation[2]. Unfortunately, this is also the case in urban planning and development, which makes it a learning process through trial and error and we must accept imperfect and constantly changing systems.

In such a context, the control centre therefore proceeds by evaluating the difference between the effect they wanted and the one they got and therefore changes their actions to get as close as possible to the purpose. This works through feedback. To perform it, the controller must obtain information on the state of the system and its environment. It must be able to identify the effects of its actions to rectify and adjust them. Without this information, the regulator cannot work properly and, eventually the system will end up disappearing, victim of entropy: the natural tendency of closed systems to fall apart over time.

Urban planning as we have defined it has several dimensions: technical (urban engineering, construction), formal (urban design, architecture), legal (procedures, building rights attached to plots of land), economic (jobs), financial (financing, balance sheets), and also natural because for plants and animals the city is also an ecosystem. The systemic approach helps us to grasp simultaneously all these different dimensions, in order to try to consider urban planning in its entirety and not only according to the particular angle of each corporation of specialists. Indeed, systemic analysis is a suitable method for describing complex phenomena with multiple elements and interdependencies. For complex phenomena Descartes' analytical and reductionist method ("to divide each of the difficulties that I would examine into as many elements as possible, as required to understand them better[3]") quickly finds its limits because of the multiple elements. Indeed we must consider them before understanding the whole system, not forgetting that the whole is always more than the sum of its parts. However, a complex system can always be broken down into simpler subsystems. If a subsystem's content and its internal organization are temporarily eluding us (or are indeterminate by nature[4]), to know its function is enough for us, as well as what it

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[2] Such a so-called perfect system would have a tree-like structure (not as a lattice one), ignoring feedback loops at its different levels. In the world of biological and social living organisms, it couldn't sustain itself in the long run (except by tolerating disorder at its base to compensate for formal stiffness at the top, as it may occur in totalitarian societies).

[3] This is the second of the four precepts formulated by René Descartes in the Discourse on the Method. We can also quote, from the same vein, the third precept: "to lead by ordering my thoughts, beginning with the simplest objects and the easiest to know, to rise gradually as by degrees to the knowledge of the most compound, and even assuming there is an order between those who do not naturally precede one another."

[4] Here we should distinguish between "complicated" systems, whose exhaustive knowledge is theoretically possible using a reductionist analytical approach and "complex" systems, some of whose elements are undetermined by nature and whom no reductionist analytical approach can fully account for. To suggest an analogy with physics, the first corresponds to the Newtonian paradigm of classical mechanics, the second to the paradigm of quantum mechanics (Heisenberg's uncertainty principle: one cannot simultaneously know the position and the speed of a particle), or the chaos theory (a butterfly wing flap in Odessa can cause a cyclone in Vancouver). Consequently, the urban system is more akin to a complex system than to a complicated one, not the least because of unpredictable actors' strategies, as we shall see later.

needs as input (information, energy or matter) and what is its output. This concept of the "black box" makes it possible to go faster into global comprehension without being stopped by a temporarily or definitively deficient analysis. It makes it possible to position oneself at the optimal level of explanation, given the means of investigation available at a given moment. A complex system can thus be considered as a "black boxes" arrangement. If each of these "black boxes" keeps its share of mystery, at least the system as a whole becomes more intelligible.

THE URBAN SYSTEM GOALS

By definition, the purpose of a living system is to ensure its survival. Without the desire to live, any system cannot withhold disturbances from its environment in the long run.

To ensure its survival, the system tries to maintain its morphological and functional stability despite disturbances from its external environment (this is called homeostasis). But this aspiration for stability does not always mean that the system refuses to change, trying to keep all its variables in their initial state. In some cases, the imperative of survival forces it into deep changes, to act both upon its "structure" variables (the qualitative aspects) and upon its "performance" variables (the quantitative aspects) in order to adapt to its environment.

An urban system is regulated by a dominant social group, or an alliance of social groups. This group or alliance naturally tends to preserve and strengthen its position of power. For that purpose it has to strengthen its social base, which is, in a democratic system, the group of voters who support it. Like in any human group, the local system tends towards reproducing itself.

Regulation carried out by the local authority applies in particular to the urbanization size, its extension in space or height. Generally, conurbations do not oppose their economic activities and population growth. But local authorities may be cautious about urban development. With urban plans and the various legal tools available to them (and which will be discussed later in this book), local authorities have many options to guide their urban development, or to block it.

We have been able to observe that the expansionist or, conversely, cautious attitude of a given local authority can be explained by five factors: available space, recent demographic evolution, economics and jobs, level of equipment achieved and need for urban restructuring or not. (We'll discuss these five rationales in more detail in chapter 7 on planning policies).

If **space** is abundant and landowners have political clout, they will push for expansion, generating capital gains. On the opposite, a local community constrained geographically or administratively may want to stabilize its population to avoid saturation and congestion.

Recent **demographic change** often explains the attitude of a local authority: if an influx of population has occurred, it must first be absorbed before accepting a new expansion. Conversely, a declining population, increasingly emptied schools, anaemic trades, and declining tax revenues, would encourage the local authority to promote new developments, whether they be located on natural or agricultural areas (greenfield sites), or in already built areas (brownfield sites).

Economic activity and balance between housing and employment are an ordinary concern for the local authority (unless it decides for it to be mainly residential). A community with a lack of jobs will prioritize its developed lands for activities and will halt new housing

construction. Conversely, a community with many jobs and high tax revenues will be able to invest in public facilities and accommodate a new population.

Equipment, infrastructure and public services level is the fourth factor explaining the attitude of the local authority. A surplus level, i.e. the capacity of welcoming more inhabitants without further spending, is a favourable factor for expansion. A deficit level of equipment does, on the contrary, cause for caution. We must first make up for what is considered a normal level before accepting new residents, who will certainly be taxpayers but who will initially put pressure on the local authority for new investment spending.

Finally, **urban restructuring** work becomes necessary at certain times in order to adapt the city's morphology after a period of insufficiently planned growth. This means main roads widening and radio concentric organization instead of "fingers expansion", with new neighbourhood core centres developing, etc. Urban restructuring which rationalizes and densifies the use of space, can bring about new land supply for housing and growth.

The attitude of the local authority, either expansionist or cautious, depends on these five logics. It also depends on the local authority's size and the link between its administrative perimeter (the area in which it exercises its regulatory power) and the spatial extension of the urban area. A local authority operating within a restricted area will have a better chance of adopting a protective behaviour, favouring a particular category of population or some kinds of urban uses. On the contrary, a local authority exercising its power over a larger territory, more diverse at the outset, will be less protective and less inclined to relegate social or functional difficulties to neighbouring local authorities.

When communities close to urban centres adopt restrictive and protective policies, urban growth is shifted to more distant peripheries, where small rural communities happily welcome new population which are going to increase their property values. Thus we observe that urban areas expand in a staggered way into natural and farming land.

But the ruling group in a city cannot directly create its social base since the inhabitants are free to come and go. The city is therefore an open system whose future is partly beyond the power of its regulatory body. In particular, productive activities in a market economy are beyond the local government control. But they are at the foundation of cities' development or decline.

JOB CREATION AND URBAN DEVELOPMENT

Initially, job-creating companies and institutions have put the urban system in motion, ensuring its momentum and defining its growth or decline. In the Neolithic period, the population tended to spread diffusely over the entire territory used for farming and breeding. By improving their performance, agricultural activities were able to generate a surplus for exchange. This surplus then allowed to feed men who no longer worked in agriculture but who exercised political, religious, military, trade or craft activities. Cities were thus formed by regrouping these non-agricultural activities in exchange centres. Indeed, these non-agricultural activities need each other and tend to agglomerate at a given point that becomes a city. In industrial times this phenomenon accelerated as agricultural activity represented a decreasing share of the overall product and labour force. Such institutions and non-agricultural enterprises created jobs that attracted populations from the countryside and thus determined the birth then the growth of cities. Today, in the opposite direction, the industry decline in some areas leads in its wake to cities decline.

Export and domestic jobs

Traditionally, the economic base theory highlights the role of job-creating activities in cities expansion. According to this theory's initial formulation, the development of "exporting" activities, which are activities that produce goods and services for consumers outside the city, is the primary factor of urban growth. These "exporting" jobs (also called "direct" jobs) make the "economic base" on which the development of the city draws.

Exporting jobs, in turn, generate local "domestic" jobs (also called "indirect" or "induced" jobs) working towards meeting the market and non-market needs of the city's inhabitants. The number of domestic jobs depends on the number of export jobs.

A computer manufacturing plant creates export jobs. These jobs in turn generate employment in shops (bakers, butchers, etc.), trade (electricians, masons, etc.), services (hairdressers, insurance agents, etc.).) and local administrations (teachers, town hall staff, social services ...). Soldiers barracks, a national administration also create direct jobs to the extent that their services are aimed to agents mainly outside the city. These jobs should be considered as "basic" as industry jobs.

Jobs generated by tourism are also basic jobs. Touristic services strictly speaking are not exported because the tourists come to consume them on site but they nonetheless make revenues in the local trade balance.

Conversely, the loss of direct jobs following the closure of a plant, barracks or an administration has a knock-on effect in reducing the number of jobs.

Homer Hoyt, one of the first to formulate the economic base theory, estimated the ratio between direct jobs and induced jobs to be about 1 (every direct job generates an induced job).

Local revenues and residential economy

The initial formulation of the economic base theory considers jobs and not inhabitants' incomes. But for several decades, the causal relationship between exporting activities and urbanization has loosened up, due to several reasons, including increased mobility and the growing part of money transfers in household incomes.

Phenomena such as car democratization, road infrastructure improvement, or high-speed trains, have allowed a considerable increase in the distances travelled daily for work or other purposes. Consequently city dwellers can now live in rural areas and, on the opposite, rural dwellers can adopt urban lifestyles. The city has spread across space and it is sometimes difficult to identify it in large urban areas with multiple core centres. However, although the urban system they are supposed to regulate has become more and more open, local authorities in charge of urban planning still have permanent administrative boundaries.

The share of transfers in household income did nothing but grow through the welfare state progress.
These transfers can be:

- benefits paid by the State and public institutions: retirement and invalidity pensions, unemployment and family benefits, etc.;
- funding by international institutions;

Finally, these transfers can be private when expatriates send part of their wages to their family back home.
Capital income, when sufficient, also makes it possible to live outside employment zones.

From the economic base theory standpoint, these transfers have the same effects as exporting jobs: they generate a "residential economy", creating jobs locally that can be considered as induced jobs. Some territories have a very small export base and live mainly on transfers. When the number of beneficiaries of these transfers increases locally, urbanization as a result is stimulated all the more.

Revisiting the economic base theory

Some researchers have been led to revisit the economic base theory, no longer considering jobs but inhabitants' incomes.
For Laurent Davezies[5], there are four types of "basic" inhabitants' incomes:
- The classic **trading production base**: wages and capital revenues that remain on the exporting activities site;
- The **public base**: civil servants' wages;
- The **residential base**: retirement pensions and income from residents employed in another urban area;
- The **social base**: benefits such as unemployment benefits, family and social benefits, invalidity pensions...

Such economic base is no longer analysed through local jobs but through inhabitants' incomes[6] generating domestic activities (induced jobs). In some countries where the weight of public spending is predominant, the exporting productive base as such has become a minority in the overall economic base of most cities. Territories that are not very productive in exportable goods and services, but are attractive living areas, may experience more sustained urban development than competitive productive territories, which are growing economically, but are located in less attractive areas.

FROM ACTIVITIES AND INCOME TO DEMOGRAPHY

Direct and induced jobs creation as well as local incomes increase, create an appeal for migration from outside. This migratory surplus adds to the natural population growth (balance of births over deaths). The city's economic growth is driving its population growth. This phenomenon also plays in the opposite direction: an economic downturn leading to a demographic decline. But in this case inertia is greater because unemployed populations will first seek to stay put while living on welfare benefits and savings.

This phenomenon also plays qualitatively. Executive jobs attract middle or upper classes. Executing jobs attract populations of workers and employees. Each economic base is associated with its socio-demographic base.

Beyond a certain threshold, an urban area growth becomes cumulative because of the "external economies" it brings to companies, allowing them to reduce their "transaction costs". Qualitatively, cities will also specialize in certain socio-demographic bases. A high-tech company is more inclined to settle in a city full of executives than in a working-class one. The socio-demographic base in turn interacts with the economic base.

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[5] Laurent Davezies, "La République et ses territoires", Paris, Seuil, 2008.

[6] A neighbouring concept is also used: the one of "presential economy", which is linked to the inhabitants' inclination to spend their incomes on site. This propensity is stronger in attractive and residential territories than in only productive territories where inhabitants tend to spend elsewhere (holidays, travels, purchases). This strengthens the prosperity of attractive territories whereas it weakens the one of only productive territories.

FROM DEMOGRAPHY TO HOUSING

Population growth results in housing and public and private facilities creation. It creates a need for urban development or redevelopment to which the local authority must respond.

Even if the number of jobs does not change and the net migration balance remains zero, there are still housing needs that must be met. These needs come first from the natural balance if births exceed deaths. But they also come from the households' tendency to occupy more floor space per person when their income increases. This trend is linked both to the decreasing household size and to the increasing standard of living, which leads us to wanting more space. Finally, the housing stock renewal, which is replacing too old or inadequate housing, can also lead to new construction.

On the opposite, transforming second homes into main residences or decreasing the number of empty dwellings are also ways to meet demand without having to build new housing.

FROM HOUSING TO EQUIPMENT, LAND USE AND PLANNING

Population increase also causes demand for equipment and services from the local authority and private providers. Inhabitants and activities are also taxpayers who bring revenues to the local authority's budget and allow it to finance infrastructure and public services.

Housing, business premises and equipment require developed land. They claim land.

Finally, the community, in order to bring order to urban development, is led to implementing urban planning and construction regulation.

Causalities unfold as follows:

Activities and Transfers -> Residents -> Housing -> Land -> Equipment -> Urban Planning

In reality, causalities aren't as straightforward or linear. They are partly circular in the sense that induced elements become in turn inductive. For example, before settling in in a city, businesses will explore how housing supply and prices can accommodate their staff. Indeed, they will not want to invest directly in housing construction or having to increase their employees' salaries because of locally high rents. Therefore, a system feedback exists in the system from housing to activities.

Companies are also sensitive to equipment levels, the possibility of buying or renting improved land and premises at reasonable prices. They also take into consideration local taxation levels. More generally, the return effect from the urban context onto the economic one is stronger today than it used to be when the theory of the economic base was first formulated. Services and high technology activities require a pre-existing urban infrastructure and social content whereas extractive and processing industries did not (and often created their own urbanization).

THE CITY, AN OPEN SYSTEM

The city is a **system open** to the outside, unlike closed systems operating in a closed circuit. It is subject to strong influences from its natural environment (water and air pollution, weather unpredictability, natural disasters such as floods, etc.) and from outside political, economic and social human factors (the State and other government levels, national and multinational enterprises, NGOs, etc.). Its local government can influence only some of the urban system components. Much of its key elements (or sub-systems) are in fact out of its control, as we will see below. Such an open system may seem more fragile, depending on events or decisions taken elsewhere. But its openness enriches it through information and opportunities, giving it a greater "variety". Conversely, a closed system, with few internal diversity, protected from external influences, is more likely to disappear when its environment changes.

The degree of openness of the urban system, meaning how much control the local authority has over it, varies according to the area. To appreciate its openness we can break down the urban system[7] into six categories (or subsystems), starting with the most concrete ones:

- **Land**, the space on which the city falls within its administrative boundaries and which is not only a physical datum but also the sociological reality of land ownership (which social groups own the land?);
- **Equipment** such as infrastructure (roads and railways, underground networks, etc.) and public services (schools, hospitals, social and cultural centres, administrative buildings, sports facilities, green spaces, etc.);
- **Buildings**: houses, buildings and premises;
- **Goods and services production** that takes place on the city's territory and provides jobs and income;
- City's **population** with its socio-demographic characteristics: age groups, socio-professional categories, attitudes and behaviours, etc. .;
- And finally, **urban planning documents** and building rights, i.e. the written rules applicable to planning and construction sanctioned by a court.

On each of these six areas, the local authority has unequal ways of action.
Land is a privileged area of intervention for the municipality. Because they are local, they have a good knowledge of its physical and sociological dimensions. They have public authority's prerogatives that allow them to acquire land against the owners' will (either by pre-emption or expropriation) or to force them into readjusting their plots. The municipality can then put land plots back on the market, possibly after having serviced them, in order to create an offer and to weigh on prices.

Equipment, infrastructure and services are also largely under the municipality's responsibility. They can implement financial mechanisms to pay for their investment and operation. Depending on the country, they have more or less extensive power to set the level of local taxes on households and businesses that will benefit their budget. They also set fees and planning obligations that are charged to builders and developers to pay for infrastructure, public services, and connexions to public networks.

For buildings, housing and premises, the town hall must rely more on its partners, businesses, individuals and administrations, than on itself. However, by improving land or seeking loans

[7] Setting up boundaries of a complex system in connexion to its environment remains subjective: the observer is not outside the observed system. He projects himself into his systemic intellectual construction with his ideological prejudices, his passions, his material and psychological interests. What he builds is no more than a grid designed to achieve a better understanding of a multifaceted reality which is difficult to grasp as a whole.

and subsidies from the central government, they are able to direct construction towards the housing categories that they intend to favour (for example, social housing).

Activities are a field where decisions do not really belong to the city council but to external actors who reason on larger spatial scales, regional or international. In some countries, the law prohibits local authorities from taking equity stakes in private companies or lending them money. It thus prohibits any attempt at "city government socialism". If the local authority cannot directly create productive jobs, at least it can encourage them through offering improved land or premises for businesses and developing the services they need.

The local government does not control its population either. People are free to come and go, to settle or relocate. The municipality can only play indirectly on the housing supply in order to attract the desired socio-professional categories, either low income or well-off. Generally, the local authority is not responsible for social, educational, security and health policies. They are considered too close to citizens to ensure impartial decisions. But in fact, they complement the central and regional governments' actions thanks to their precise knowledge of the local context. Local authorities are able to bring state policies, which work vertically in silos, to a transversal coherence at the local level. And, lastly, they are able to involve inhabitants in public decisions.

Local regulations implemented by the local authority are mainly building rights that determine what landowners can use their plots for. Although these local regulations are themselves enshrined into national law limiting what the local authority can do, they nevertheless keep an important capacity of decision for building rights attached to each plot.

In the end, issues on which the local council has a direct influence are about land planning and development: land use, public facilities and their financing. In other areas like activities, population, or buildings, they cannot be a direct regulator. They must cooperate with other control centres that operate at different geographical scales, such as the central government or private companies. But through land planning and development, the local council acts indirectly on other areas because there are interactions between the physical frame (the container), and its population, housing and activities. Through organizing and developing space, the local authority prepares such and such types of housing construction or renovation and such and such activities set up that will condition the neighbourhood social categories.

Many authors have explained that such a regulation, the intrusion of politics into the economy in the name of "general interest" is never neutral and always reflects a local balance of power and a compromise between the social groups involved. However, in this book, we will remain on a technical level and focus only on how the sub-system of urban planning and development, which we have just isolated within the general system of the city, is managed by its regulator, the local authority. We will emphasize the way in which the local authority operates this regulation by handling three levers:

- Action on land: amicable purchase, pre-emption, expropriation, readjustment;
- Infrastructure, public services and their financing;
- Building rights granted to plots through the local plan and planning permissions.

We'll deal with how these actions have direct effects on these above-mentioned fields but also side (and sometimes adverse) effects on other parts of the urban system.

URBAN PLANNING, A SYSTEM OF ACTORS

Analogy with cybernetic systems could, however, favour a mechanistic and deterministic vision of urban planning, the idea of a machinery whose regulator, the local authority, would only have to know the physical laws of evolution to control the future. But things are not that simple. The town hall is not the only one in play. It faces other actors who weigh decisively:

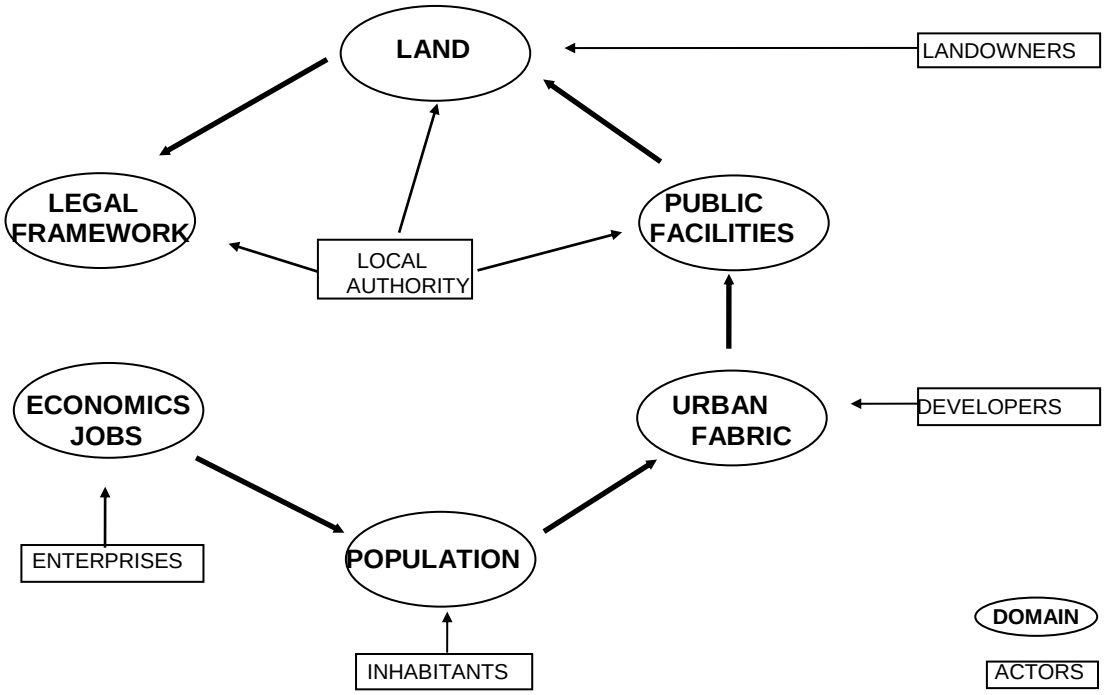
entrepreneurs, landowners, developers and builders, professionals and intermediaries, residents associations. The ways the actors behave is not always predictable. Sociology of organisations[8] has shown that in any organized system of action, members strive to increase the area of uncertainty they control in order to strengthen their power towards each stakeholder. The actors try to outsmart forecasts so that they can then negotiate such uncertainty to their best interest. To achieve such unpredictability, actors use the available leeway between, on the one hand, the resources they enjoy and, on the other hand, the constraints they face. Urban planning does not escape the reality about groups and individuals behaviour. Main actors keep a significant degree of latitude not to comply with local council's expectations. Businesses and developers have opportunities to work in other territories. Landowners have time on their side, much more than the mayor who is submitted to elections. They can choose to wait. Residents groups who get organized for a particular purpose, for example environmental protection, will seek to put pressure on the regulator in the hope its actions towards other urban development actors may be re-orientated. That way these residents groups also contribute to the urban regulating process.

But all actors in the urban system depend on each other. Businesses need the local authority to provide them with the services and infrastructure they need. They need builders to house their staff. Developers and builders expect owners to sell them land for their operations and expect the local authority to build equipment and grant them planning permissions. They also expect companies to provide salaries to residents so that these can afford housing. In turn, the local authority depends on other actors: businesses and households to pay local taxes, developers to house residents and activities, landlords to act as land bankers.

Because of actors' freedom and their ability to produce uncertainty, the urban planning system is indeterminate, unlike a mechanical system. Despite planning and programming, what actually happens is not always consistent with what was originally planned. About the war, Clausewitz wrote that a battle plan is necessary but it becomes obsolete as soon as the fight begins. Urban planning does not have war violence and pace but it is nonetheless a battlefield on which actors cooperate and clash. The urban plan is just as necessary as the battle plan. But experience from last decades has shown us that, because it is difficult to predict actors' behaviour, we shouldn't be too confident about the longevity of a forecast urban planning scheme. Making a legally binding urban planning document is not sufficient to ensure its realization. In some cases, actors even try to outsmart the forecast, for example by raising land prices in a planned extension, making it almost impossible. But an indeterminate system does not mean that the local authority has no ways to act on it. The system randomness does not cancel any possibilities of actions and feedbacks. The local authority has the ability to structure the other actors interplay by acting on the three levers that we have already mentioned: planning and building permission, infrastructure and public services, and land use. However its freedom is not complete because it is subject to state regulations and the main principles of law. These are the many resources that its partners can use against the local authority.

[8] Michel Crozier and Ehrard Friedberg, "The politics of collective action, actors and systems".

THE SYSTEM OF URBAN PLANNING AND DEVELOPMENT



The analysis of the urban system is based on the identification of six domains that are set in motion by five categories of actors.

TWO GROUPS OF INTERACTIONS

1. **Activities – Population - Dwellings**

 Creation of activities by companies and administrations as well as income from transfers generate migratory pressure and an influx of inhabitants.
 Arrival of new inhabitants generates demand for housing to which developers respond.
 In return, the stock of available housing and qualified workers among inhabitants enables businesses' implementation.

2. **Land – Public facilities – Building rights**

 Building rights have a direct impact on land prices.
 Public facilities and infrastructure, fees and planning obligations also have an impact on land prices.

The local authority can act directly on these three domains, land, public facilities and their financing, land rights. But it cannot act directly on the other three domains: activities and transfers, demographics, and buildings.

Land and public facilities, which are the supports of dwellings and activity premises, link the two groups of interactions. Through planning and development of its space, the local authority acts indirectly on urban system domains that depend on other actors.

CHAPTER 2: URBAN LAND PRICES FORMATION MECHANISM

In a free market and private landholding system where developers compete for the purchase of building rights, the price of land is counted down, based on a residual value.

In fact, before making an offer to the landowner, the developer draws up a forecast budget balancing its expenses and revenues. They begin with calculating their future revenue, that is to say, the turnover they can achieve on the piece of land. It depends on the amount of floor space that can be marketed and of the anticipated selling price for the different types of real estate products: homes, offices, premises, etc. This calculation therefore assumes that the developer already has a good knowledge of the local real estate market but above all, has a precise idea of the building rights they will obtain from the local authority. Such building rights are known either because the developer has obtained from the local authority a building permit (or an outline planning permission), or because the planning document (the local plan) is legally binding and guarantees these rights to build. The developer must also take into account the impact on their receipts of any obligations imposed by the local authority to carry out part of social housing program at a capped price, below the market value. Such obligation will result in a reduced revenue.

They then calculate their expenses:
- Building costs,
- Development costs (internal infrastructure such as streets and utilities, parking lots, green spaces ...),
- Fees and planning obligations they will have to pay to the local authority as contributions to public infrastructure and facilities,
- Other expenses that can be bundled together as "gross margin" and which include: company operating costs (salaries, overheads, studies, etc.), marketing expenses, financial expenses (interests), and finally the net profit (or "net margin") remunerating equities invested in the project.

Therefore, the difference between receipts and expenses is the price that can be paid to the landowner. Of course, the developer would like to pay less than this difference and increase their margin, but they may not be able to make the purchase if another competing developer have agreed to pay the maximum price resulting from the countdown (or residual value).

The developer will naturally seek to protect themselves against any legal risks (e.g. not obtaining the building permit, or being sued by third parties) and economic uncertainties (real estate market turnaround). To this end, they will have the landowner keep the longest possible ownership until they obtain the building permit free of any claim and until a sufficient part of the floor space has been pre-sold, in order to guarantee the project economic viability. Their banker will also wait for this to happen before granting accompanying credits. In some cases, the agreement to sell (including suspensive clauses) provides a profit-sharing arrangement that will depend on the building rights being finally obtained from the local authority or on sales results.

In this attempt to understand the system, we will not address the moral issue of whether or not this ground rent granted to landowners is justified. As in most cases this is not the result of work nor risk taking.

The developer may also prefer to buy the land for cash, without waiting for the building permit and the results of pre-marketing in order to be ahead of their potential competitors. The landowner will be guaranteed to sell their land regardless of political, legal and economic

hazards. But in exchange, they must agree to a lower price, taking into account the financial cost of land banking and a risk premium both incurred by the developer. For some years the developer has become a land investor, but they may earn a return by renting out the property they have acquired. If a real estate turnaround occurs in the meantime, the developer may decide to start building anyway, taking advantage of lower building work prices, and rent out the built floor areas before reselling them permanently later, when the market picks up again. These long-term strategies require the developer to have equity capacity or to be backed by large investors such as a real estate investment trust.

Another way for the developer to limit economic risk is to resell after subdivision to colleagues all or part of the land they have developed and for which they obtained a building permit. Indeed, the financial risk (and the volume of committed capital) taken on land acquisition and improvement is reduced compared to the one taken on the whole building. The sale of improved plots with building rights to fellow builders also diversifies the real estate offer and responds to a wider range of customers locally.

From the developer's forecast balance sheet structure, we can deduce some urban land market characteristics.

Density impact on land prices

The density (plot ratio resulting from height and footprint rules) granted by the local authority has a direct and almost proportional effect on land prices, provided of course that the real estate market admits such a density (tall apartment buildings in a distant peripheral area will not find buyers at a balanced price). For example, let's imagine that the regulatory density is multiplied by two: it is then possible to build on the same land surface area twice as much floor space and, consequently, to double the revenue. Expenses are also multiplied by two and, in particular, the amount available for land. Therefore doubling the density has the theoretical effect of doubling land prices.

However, this linear function may be a stepped process if the building category changes. The transition from individual to collective housing, for example, may cause such a step as building cost per floor space square meter is higher (because of lifts, in particular). Similarly, in a tall building, the obligation to build additional parking levels deeper underground, therefore increasing the cost, will introduce a discontinuity in the relationship between density and land price. Near such a threshold, a slightly lower density can result in a better profitability.

When the master plan distributes legal land density, it distributes value to properties. This explains why it is sometimes difficult to keep the planning documents design going smoothly.

Impact of contributions to public facilities and infrastructure expenditures

If fees and planning obligations paid to the local authority increase, the item “Land” in the forecast balance sheet must theoretically decrease by the same amount because the other items are fixed (within some limits). The contributions are in connected vessels with the land prices. We will see in the next chapter how this works.

Impact of social housing

When developers have to provide a proportion of social housing, it decreases their available budget to buy land. In principle, all things being equal, such obligations induce lower land prices.

Impact of subsidies

Conversely, government grants to developers increase their revenues and allow them to pay more for land. Subsidies therefore have an inflationary effect on land prices. Subsidies financed by the taxpayer only make sense if the housing selling price in the neighbourhood is too low to balance the operation costs, or if the renovation costs (decontamination, demolition, inhabitants and activities eviction and relocation ...) make the project unviable.

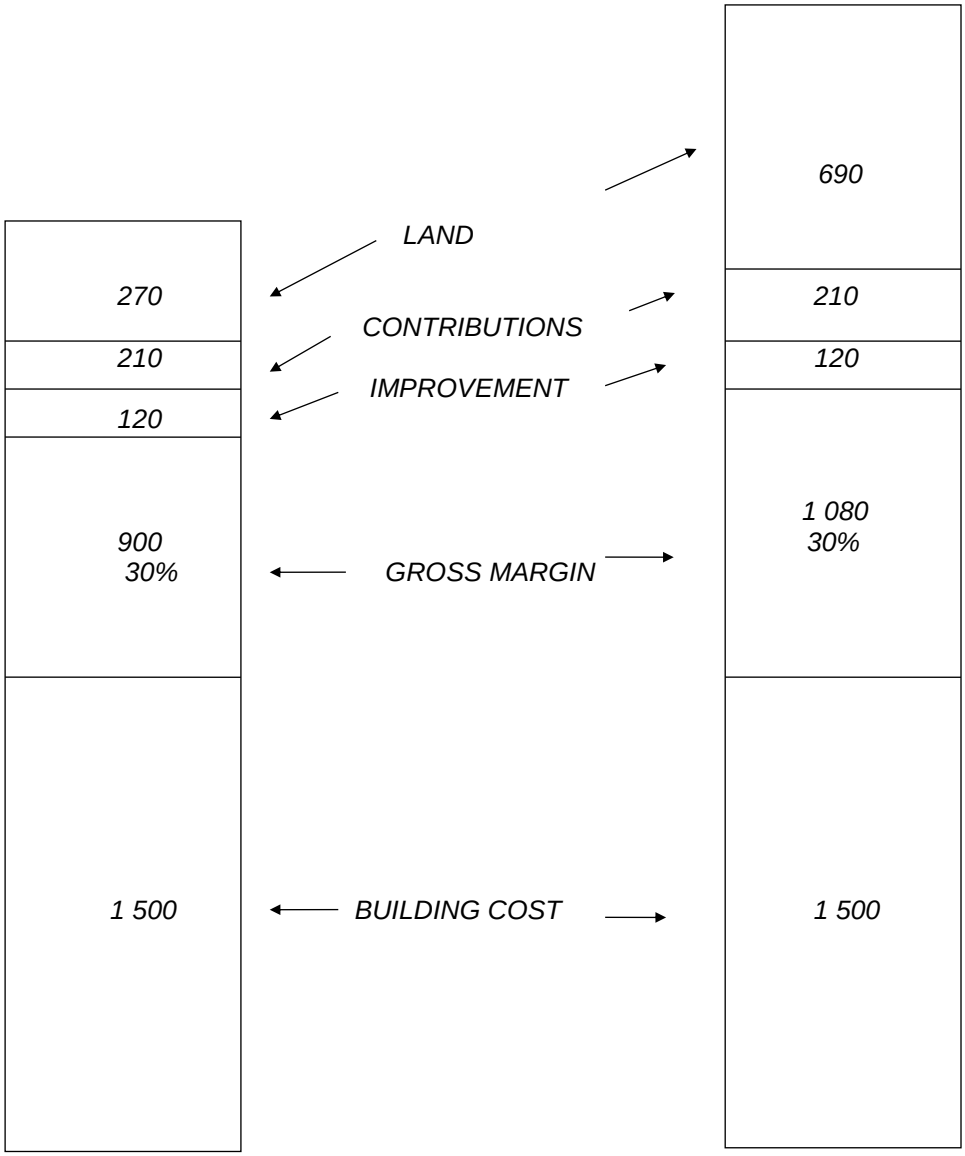
Impact of cyclical changes in real estate

In many market economies, housing and office property are subject to large cyclical fluctuations. What about land prices? The countdown structure, examined from a dynamic point of view, answers this question.

When the real estate selling price rises, we can observe that other than land, spending does not increase as much, or even remains stable. In these conditions, and because of competition between developers over land, it will absorb most of the increase. In relative value, land prices increase more than real estate prices.

We call this phenomenon **the real estate leverage effect on land** that we can express as follows: **When the real estate selling price (mainly housing and office premises) rises by a relative value, the land price undergoes a higher relative increase.**

HOW THE COUNTDOWN AND THE LEVERAGE EFFECT WORK



*Real estate market: 3**000 €/m²** floor space*

*Real estate market: **3600 €/m²***

The height of the column is proportional to the real estate market price per floor space square meter. The land price (related to floor space square meter) fills in the remaining space when all other costs have been stacked in the column.
The real estate leverage effect on land: if the selling price on the final market increases (right-hand column), the gross margin only rises when the developer keeps the same ratio (30% in the example). Other expenses are considered fixed in the short term. The land absorbs most of the real estate price variation. So in this example, a 20% increase in the real estate price induces a 150% increase in land price.

As mathematically demonstrated in the box below, the leverage effect is stronger in the outskirts, where the land share in the selling price is lower, than in the city centre where it is higher. Land markets in the outskirts are therefore subject to further variations when real estate prices move upwards.

But when real estate prices fall, this phenomenon does not work backwards as it should, at least in the short term, because landowners can wait: indeed the cost of storing land is relatively low, at least lower than a built property. In the latter, taxes apply and it may deteriorate if left vacant. Instead of a leverage effect we observe then a ratchet effect: the urban land price rises easily but will not come down in the same way.

During the real estate cycle downward phase, high land prices prevent operations from taking place. The real estate supply falls down and prices eventually rise. The production response time is slow, because they have to mobilize the land, study the projects and get the authorizations for the building to start. It takes time for offer to meet demand. This delayed effect explains real estate cycles amplitude and duration.

In the long run, housing prices are correlated with households' disposable income. Real estate values therefore increase with the inhabitants' standard of living. But the share of land (that is, its location) in these values increases because of urban space being scarce. Indeed land cannot be moved, unlike most other types of goods.

Examining the developer's countdown demonstrates that the urban land market is not independent from the real estate one. The former is just a decal of the latter. But its upward variations are magnified compared to the real estate market's and its downward variations are mitigated. The importance of real estate and land cycles and the disruptive effects they generate on the global economy, not to mention land rent recovery for the benefit of the community, naturally raises the question of their regulation by public authorities.

THE REAL ESTATE LEVERAGE EFFECT ON LAND MATHEMATICAL FORMULA

The formula components are as follows:
Selling real estate price: [SP]
Gross margin coefficient: [a]
Construction cost: [CC]
Development cost: [DC]
Fees and planning obligations: [FP]

According to the countdown: LAND = SP - a*SP - (CC+DC+FP)
Developing this mathematical formula gives: LAND = SP(1- a) - (CC+DC+FP)

From the latter we see that the absolute LAND variation is dLAND = dSP(1-a)
And in relative terms the LAND variation is: dLAND/LAND = (dSP/SP)(SP/LAND)(1-a)

The land price change in relative terms (dLAND / LAND) is indeed a function of the real estate selling price in relative terms (dPV / PV).

The importance of the leverage effect also depends on:
- The ratio between selling price [SP] and land price [LAND]: the lower the land shares in the balance sheet, the greater the leverage effect (in the case of outskirts locations). On the other hand, when the land price represents a large part of the balance sheet (in the case of city centres), the leverage effect is lessened;
- The gross margin coefficient [a] level: when this is higher, the leverage effect is not as strong.

CHAPTER 3: LAND AND REAL ESTATE MARKETS CONTROL

Where urban space is abundant and easy to acquire, the free market can supply builders with land for their activity. However very often, urban space is limited and landowners keep it scarce by retaining it (the cost of storing land is low or nil and land cannot be moved). The local authority is then called upon to regulate land supply. To act on markets, public authorities can attempt three strategies: a/ authoritative price control, b/ regulatory provisions fine tuning, c/ and finally creating an offer capable of meeting demand. The latter strategy only works well if the local authority is able to compartmentalize and control the different urban land markets, as we will see.

Price control

Price control (keeping them below the free market) only works short term in a market economy because it does cripple supply, and increases imbalances over time. It also induces dissimulation (off hand dealings and black market) and unjustified rents for the benefit of some. And yet this means that local authorities do have legal means to implement these control methods, coercive towards private property, which is not always the case in democratic regimes.

Fine tuning regulatory provisions

Regulatory provisions, through developers' countdowns, have effects on land prices, as we saw in the previous chapter. Displaying contribution to public facilities and infrastructure expenses impact on the forecast balance sheets: it increases expenditure, and thus encourages developers to lower bids to landowners. We will deal with that issue in the next chapter. Social housing and environmental requirements can also help to stabilize land prices in the same way.

Conversely, a higher regulatory density (plot ratio) allows developers to pay higher prices for land. Often, this can unlock transactions, for example, in urban renewal schemes when plots have already a good return value (because renting them out is profitable) or when preliminary costs (eviction, demolition, decontamination) are high.

Public action on the land market through regulatory provisions represents a minimal cost to the local authority, only working out and displaying provisions. But it is difficult to adapt to economic cycles, which are magnified on land prices by the leverage effect seen in the previous chapter. And for the local authority acting as regulator, setting them accurately is not easy for lack of precise economic data on private production. Furthermore, these provisions are structural by nature; they respond to social needs (such as justice), irrelevantly to the short term economic situation regulation. Because of inertia, once set up, they are very likely to become out of step with the market reality. Consequently when the real estate cycle goes down, operations risk deadlock. When it goes up, they may stabilize land prices insufficiently.

Land supply by the local authority

In a market economy, the most effective way to regulate prices is to create sufficient supply. If private actors are not able to do so, public authorities are entitled to take over on a temporary or permanent basis. The local authority's legitimacy is all the more justified because the ground is a special kind of goods, limited in supply by nature, which cannot be moved nor created from scratch. Additionally, its use impacts directly on citizens' lives, food security and environment.

Local authority's responsibility is also legitimate because urban infrastructure and services will remain public in most cases.

The local authority can increase improved land supply simply by building the necessary infrastructure and streets and utilities. They can also encourage or force private landowners into developing their plots by making them contribute to public expenses. But relying on landowners is uncertain. Most of them think like annuitants and not like entrepreneurs. They are willing to take part in public development only if they are sure of making a secure and comfortable capital gain. Otherwise, they will require the local authority to buy back their land, which boils down to expropriation with its legal and political difficulties. This method worked when streets and utilities were simpler: a stabilized dirt track bordered by open ditches. It is more difficult to implement when the cost of streets and utilities is high compared to the initial land value.

This is why public land development usually starts with complete land acquisition. Land, without building rights from the outset, is valued and acquired according to its previous use value (agricultural land reference price in the outskirts, industrial wasteland reference price in inner cities, for example). To this end, the local authority arrange for themselves a de jure or de facto monopoly and seeks to push out any other potential buyer. They can do this by buying well in advance without revealing their plan. In some countries, they can use a pre-emption right which substitute themselves to the buyer in an ongoing transaction (see below). Finally they can expropriate at the previous use price (which is not always legally and politically easily achievable) if no amicable solution has been found.

Once they have got the land, the local authority change their urban planning document according to the project in order to grant subdivision and building rights. Next infrastructure, streets and utilities, as well as urban services are being built. Then land can be parcelled out and improved plots can be sold or leased to builders or end-users. The improved plots selling price has to cover (in whole or in part) expenses: initial land acquisitions, development works, studies and management, and finally financial costs (see below how a forecast land development balance sheet looks like).

Selling or leasing improved plots is similar to a private law transaction. The contract may include specifications: dwellings' size and selling price, environmental and architectural qualities, energy performance, etc. This way they can be much more precise and better fitted to each plot than a local or detailed plan set up unilaterally in advance by the local authority could ever do.

Urban land development is both a public and a commercial deed since it involves, on the one hand, creating infrastructure and facilities according to a pre-established plan and, on the other hand, producing improved plots and buildings to be resold to developers or end-users. The local authority's administration is generally organized into vertical services (public works, social action, culture, education, economy, law, finance, etc.) which are not well fitted for project-management. A local authority can create internally a cross-cutting programme; however it still operates administratively without the flexibility of a private company. This is why public authorities often delegate land development to a company. This can be either a public enterprise, with a capital wholly or mainly owned by public bodies, or a private one linked to the local authority by a long-term public service concession contract. In the first case, the land development potential financial deficit will be charged to the local authority. In the second, the local authority will expect the private company to finance the land development without using any public funds.

When the land developer is public he is generally not a builder and his role is limited to producing improved plots and facilities. When the developer is private, he is also a builder. So to him land development is nothing more than a way of producing the raw material needed for

building. The private developer under contract with the local authority has an advantage over his competitors because of the privileged access the contract grants him to this often rare commodity that is urban land. Later on, we will talk about the land developers generally, whether they be the local authority acting directly, or a public operator, a private company, or even a landowner or a landowners association[9].

Like the common developer or builder seen in the previous chapter, the land developer sets up a forecast balance sheet. But his thinking process is different, in fact quite the opposite: instead of starting with the floor space selling price on the real estate market to set the acceptable land price (according to the countdown which gives the residual value), the land developer starts with estimating the cost of land at its previous use value[10] and comes up with revenues. These revenues are then adjusted, through density and programme (see below), in order to balance the forecast balance sheet.

Please note that a common private developer and a land developer will not buy the same kind of raw material: the former will buy plots with building rights whereas the latter will buy raw land, not yet serviced and without building rights. Revenues will not be of the same nature either because the common developer sells built floor space to end-users whereas the land developer sells plots with building rights to builders.

In addition to the raw land acquisition price, the land developer's expenses include development works (streets and utilities, parking lots, green spaces…) , fees and planning obligations paid to the local authority, and all other expenses that we have put together, as for the common private developer, in the gross margin.

Development works are often the balance sheet biggest item, at least in urban extension. The larger the operation, the higher the development costs per land surface area unit, because the infrastructure and facilities stock must be replenished. Large developments can no longer benefit from existing infrastructure residual capacities. Those large developments, like new towns, have trouble to balance their budget without taxpayers help.

Contributions (fees and planning obligations) are paid by the land developer to the local authority who carries out infrastructure and general facilities that will benefit the planning area inhabitants.

The gross margin includes, as for the common private developer seen in the previous chapter, operating costs (salaries, overheads, studies, marketing expenses, financial expenses), and finally the net profit margin. The latter pays back equities invested in the project. Note that public land developer's purpose is not to pay back capital: their net profit margin may be low or nil. However they do not need as much equity capital because local authorities are their guarantors. In the same way private developers do not always try to make profit on land development. The profit margin will rather come from building. Therefore they can pretend, like public land developers, to make a very low or nil net profit as shown in their forecast balance sheet.

In terms of these expenditures, the land developer does not have much room for manoeuvre except to sacrifice quality. He has got more room to negotiate with the local authority regarding contributions to public infrastructure and facilities (but whatever the developer will not pay will have to be charged to taxpayers).

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[9] Contrary to some other languages, English doesn't provide a specific word for land developer. The term "land development corporation" is sometimes used in English speaking countries, referring generally to a public company.

[10] Unlike a common private developer, the land developer buys raw land for cash and without suspensive condition of getting a building permit.

Once expenses are known, the land developer will then calculate his revenues in order to balance his budget. Revenues come from building rights sales to developers or end-users. They are not calculated according to the plots surface area but to the buildable floor space available to buyers.

For real estate in a free market, building rights prices also result from a free market. On the other hand, building rights sale prices for social housing are often set by the local authority or the government, at a lower price than on the free housing market. The developer pays in some way for social housing due to cross-subsidisation. For each real estate product (free or social housing, trade, offices, activities…) revenue is equal to building rights unit price multiplied by the quantity forecast by the layout plan (in square metres floor space). The overall revenue will therefore depend on the programme (the breakdown between the different types of real estate products) and the density (plot ratio). Programme and density are negotiated with the local authority. They are actually the adjustment variables that allow the land developer to adjust his budget. Increasing density is the most common way to achieve this.

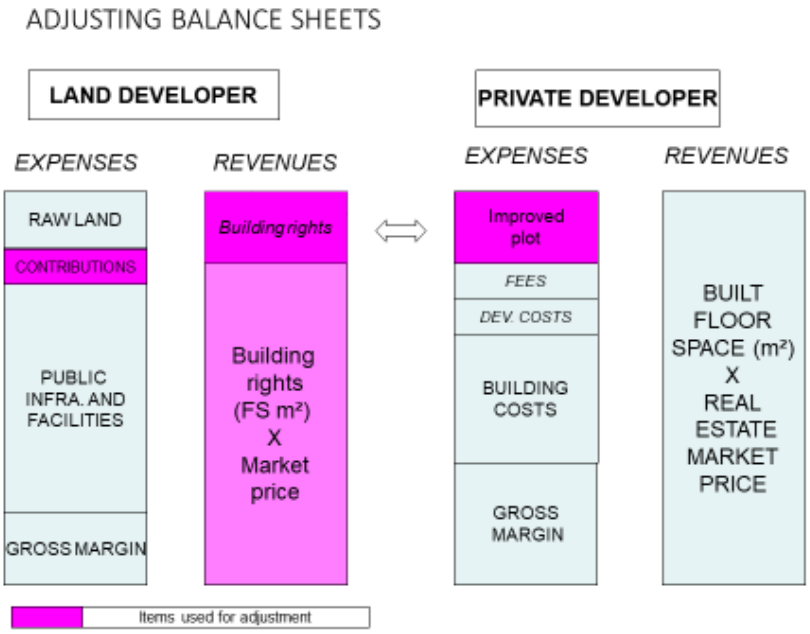
As long as the land developer builds public facilities that will serve populations outside the operational perimeter, he may receive from the local authority a financial contribution which will be added to his revenues. Such contribution is generally calculated according to a proportionality principle, covering only a fraction of the cost, related to public facilities actual use by outside inhabitants.

If in the end the budget cannot be balanced, the local authority will have to bridge the gap via a grant to the land developer.

The land developer forecast balance sheet is as follows:

EXPENDITURE	REVENUE
Raw land (land m²)	Building rights sales (floor space m²)
Development works (internal infrastructure)	Local authority contribution
Contribution to public infra. and facilities	Local authority grant
Structure costs, financial expenses, net profit (gross margin)	

The graphics below compares land developer's and private developer's balance sheets structure. The building rights sale is the link between the two (for the land developer it is a revenue, but for the private developer it is an expense).



Risks incurred by the land developer

Land developer and private developer have different products: the former sells improved plots with building rights, the latter sells built floor space. They also contrast through the raw materials they transform: unbuildable, not serviced, not rationally shaped for building land in one case; legally buildable, serviced, rationally shaped plot in the other. They are therefore two separate businesses that do not incur the same risks.

Risk due to scale: the land developer works on a wider perimeter (a block or a neighbourhood) whereas the private developer can size their operation up or down according to their own appreciation of the real estate market locally.

Risk due to long term prospect: the land developer will not be able to complete his operation before several years whereas the private developer who is directly in touch with end-users will benefit from a better commercial visibility. Consequently they can market their products on a much shorter time.

Risk due to economic cycle: in the event of an economic downturn with property prices falling, the private developer may decide to lower or give up his margin altogether and sell off his stock, or rent it out to still get an income while waiting for the next upturn. For the land developer however, due to the leverage effect seen previously, a fall in property prices will result in a much sharper decline in building rights selling prices. This not only affects their margin but also the balance of the whole operation. Furthermore, unbuilt improved plots do not yield anything.

Risk due to land downtime: the land developer buys the land in cash (he pays cash, without suspensive conditions) and gets stuck with the money whereas the private promoter is bound by an agreement to buy without any commitment on their part, as long as the operation is not guaranteed both commercially and legally .

Technical risk: the land developer often has to spend from the outset on infrastructure before any building can take place, whereas the private developer can phase construction according to the market ups and downs.

Risk due to litigation: the land developer transforms the living environment significantly and needs the local authority to alter the local plan in order to get the building rights; therefore they are particularly vulnerable to being sued by third parties. The private developer has a more limited impact on the environment and they benefit from pre-existing building rights. Therefore the litigation risk is lower.

As a result, the land developer appears to have a more risky job than the private developer. Therefore considering the risks involved and the political as well as economic nature of urban development, many agree it makes more sense to leave it to the public. The main advantage for the land developer is the prospect of capital gain when they get building rights. But for this to happen, the local authority has to control prices on the raw land market and keep them close to their former use value.

Urban land market control

The table below compares markets for the two urban land categories: unbuildable land (raw material for the land developer) and buildable land (raw material for the private developer).

Land Status	Price references	Position towards landowners	Plot ratio	Dominant market
Buildable	Future use	Competition	Determined beforehand	Real estate
Unbuildable	Former use	Monopoly	Determined afterwards	Urban raw land

In the case of buildable plots, we saw in the previous chapter that the land market, due to the developer's countdown, is a real estate market simple decal. Nevertheless, the local authority's aim is to keep the raw land price as close as possible to the previous use's price (agricultural land, industrial wasteland, etc.). This is to prevent raw land market from becoming affected by the buildable land market (which is subject to the leverage effect of real estate on land, as we may remember).

The first necessary condition to set apart and protect the raw land market is to make it clear in the planning document that land is not buildable without any local authority initiative. Ultimately, the most effective strategy would be to keep the land in its previous status, for example farming land, without mentioning any possible future development. But on the one hand city inhabitants increasingly request being informed about plots long-term future. And on the other hand, capital gain prospects will not disappear and they may weaken agricultural activity because landowners would no longer sell their plots to young farmers likely to settle, and existing farmers would no longer invest in soil improvement. We will see in Chapter Five how urban planning documents can provide "airlocks" in naming future urbanization areas while making sure the local authority remains in control.

It is in the local authority's interest as well to anticipate private actors' decisions and to acquire land while it still has its previous use status. The local authority will then have to take on the land reserve financial capacity on a long term basis. Let's not forget that for local government elected members, who are subject to medium-term electoral deadlines, such a long-term strategy may not necessarily pay off for future elections.

To prevent private actors from acquiring land positions in areas intended for public development, in some countries the local authority benefits from a pre-emption right. Thanks

to this right, they can legally take over the buyer in a property transaction. However, if the transaction price reflects future use, i.e. is well above the current use value, the local authority pre-emption at this price will only confirm prospects and increase references prices for public land control. This is why some national laws include a device by which the local authority may pre-empt at the previous use price even if it is lower than the agreed selling price. However, in this case the seller is allowed to pull out, may he consider being victim of spoliation. He may also challenge the local authority's offered price before the expropriation judge. If the transaction falls through because the seller pulls out, at least no higher price reference, that could make public land acquisitions more expensive, will be formed.

The pre-emption right is therefore a public infringement on ownership right. But as the seller was already set to give away his property, this is less painful than expropriation. For the local authority, expropriation is a weapon of last resort. But it can reveal costly because the expropriation judge is in charge of protecting private property owners against public authorities' encroachment. The judge often tends to set a price taking into account prospects for urbanization even if urban planning documents have not yet declared the area buildable.

Any effective long-term land strategy actually relies on a local actors' consensus. Developers, as well as the local authority, have no interest in land prices flaring up. On the opposite, they are interested in the local authority generating abundant and cheap land for construction. The best strategy for the local authority is therefore to involve them in a win-win collective game in which they will be assured to get the raw material they need smoothly. As for the "opportunistic ones" who would not play the game and would make overpriced offers to landowners, the local authority has many ways to increase their transaction costs, ousting them from the local real estate market, as we will see in the following chapters. Even if urban planning abides by the rule-of-law, the legal and administrative obligations being increasingly complex, the local authority benefits from very effective resources to regulate land markets, as long as they know how to use them successfully.

CHAPTER 4: FINANCING URBAN INFRASTRUCTURE AND PUBLIC SERVICES

First of all, an urban area is an area fitted with infrastructures such as streets, avenues and utility networks, and public services for educational, social, cultural and recreational purposes.

The first urban facilities were provided by Nature. Before cities developed, human groups settled where such natural facilities existed: a water source, a ford to cross a river, a sheltered bay acting as a port, an overhanging rock or an island on a river helpful for defence… Then gradually, men added artificial facilities: aqueducts and fountains, walls, city halls, religious buildings, hospitals, sewers, street paving, public lighting, green spaces, etc. The need for new equipment never stopped increasing over time due to urban development, technical progress, rising incomes. Eventually with care no longer provided by the extended family, public facilities had to take over: day-care centres, retirement homes, social and cultural centres, as well as various mental and physical health institutions[11] were built.

Catching up with equipment level or building it prior to urbanization?

Historically, the urban development process followed the "catching up" principle: housing and activities preceding infrastructure and public services that were only carried out afterwards, as and when needed and when communities could afford them. Even when the city was created intentionally and from scratch, drawing directly on the ground to outline public spaces and private plots, facilities only came later. The idea that facilities should be planned before housing is recent. It is linked, on one hand to the urban expansion spawned by the Industrial Revolution and on the other hand, to urban dwellers' new needs of health and safety, mobility, education or cultural life. In many places, massive new housing created in ill-equipped areas resulted in inhabitants' protests. Public authorities therefore found themselves having to plan urban infrastructure and services at the same time as housing, so that new inhabitants could immediately find the amenities they think they are entitled to.

Taxing in General or charging beneficiaries[12] specifically?

Urban public facilities and services are generally collective goods: no one can be excluded from their use[13]; and this use does not decrease the amount of resources available to others[14]. No private economic agent has any interest in providing such goods because they could not charge them at cost price, due to high fixed costs, unless putting themselves in a monopoly position. Indeed, expensive initial investment and lack of space[15] (prohibiting doubling

[11] At the same time, some public equipment became personal: public baths, clock and bell, telephone, etc.

[12] This section was supported by my colleague Marie Llorente regarding the application of public economics to urban facilities.

[13] "Non-excludable" goods.

[14] Their consumption is "non-rival": the service use by one individual does not affect its use by others. For example, walking on a pavement does not reduce the amount of pavement that will benefit all citizens (except at certain times of congestion). On the other hand, private goods are subject to "rival" consumption: one kilogram of potatoes devoured by one family will not be eaten by another.

[15] According to public economics land could be considered as a "common good". Its use is "rival" (if it is cultivated by a farmer, it cannot be cultivated simultaneously by another one) but it is not "excludable" (the land is the common heritage of humanity). Subsequently, privatization of land has been the most commonly chosen solution for reasons of agricultural production

infrastructures competing with each other), would put the first-mover in a de facto monopoly position. Such monopoly is unacceptable to public authorities, which are responsible for providing urban public services[16], even if they delegate management to private companies. In this respect, it is important to distinguish between the infrastructure public ownership and its operation, which may be public or private. In this chapter, we will leave aside the topic of urban public facilities management practices but we will look at how their financing mode affects the local urban planning system and how it alters financial or value transfers between community, developers, landowners, and inhabitants.

In this respect, we should distinguish "pure" collective goods whose consumption is essential to all (national defence, for example), and collective goods known as "impure", partially excludable and / or partially rival, for which users have an alternative, for example, generating your own electricity, drawing drinking water from a well on your own property, travelling on national roads to avoid toll roads, riding your bike rather than the tram. "Pure" collective goods, whose production and use is not individualized, cannot really be charged to their users because their consumption is difficult to measure (and would lead to disproportionate transaction costs for each use: do we imagine, for instance, installing a slot machine at every lamppost to operate it at night?). On the other hand, "impure" public goods can be billed to users for all or part of their cost, and all the more easily so because the transaction costs related to billings remain modest compared to the service. Water or electricity metering counter, swimming pool, theatre or public transport ticketing, all make it easier to charge users. But the boundary between "pure" and "impure" collective goods is a bit blurred and may vary depending on technology and legal framework.

Financing and building urban public facilities therefore fall within public authorities' duties. However, public facilities increase private properties' value. This especially appears when the community builds streets and utilities which will make plots buildable and increase their price considerably. In response to this unjust enrichment, local authorities had to resort to ways of charging public investment expenditure to beneficiaries: landowners and developers.

Equipment prior to urbanization works with beneficiaries being charged for it because, firstly, the public work programme and its cost can easily be singled out and, secondly, financing (down payment and borrowing) can be added to the construction cost. On the other hand, according to the catch-up principle, financing is included in the ordinary city council's budget and local taxation. Indeed, it benefits all inhabitants, each neighbourhood taking their turn. It is difficult to identify precisely the beneficiaries. Furthermore these would not always be solvent, most having finished paying for their housing a long time ago. Finally, no one actually knows the exact expense, as the work is often hidden as part of general and continuous maintenance work, including equipment renewal and reinforcement. Such work is an opportunity to increase capabilities because technical managers tend to oversize infrastructures, anticipating potential construction in the future[17].

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efficiency (although community-based ways of managing common resources have been highlighted by Elinor Ostrom's work). However, public authorities always reserve, by expropriation, the right to "de-privatize" the land if public interest requires it.

[16] It should be noted that there are private towns or neighbourhoods, surrounded by walls and inaccessible to non-residents, in which services and common areas can be considered as "club goods" whose consumption is not "rival" but which are "excludable". Such "gated communities" are found in rather unequal social systems, which have not reached a minimum stage of social cohesion and face high insecurity in return.

[17] The finest example of over-sizing is quoted by Lewis Mumford in his book "The city in history": the "Cloaca Maxima" created in the sixth century BC while Rome was still a collection of villages, was big enough for one million inhabitants. As it turned out, it is still in use today, 25 centuries later!

To recover public facilities costs from developers and landowners who benefit from higher property values, local authorities use two methods[18]:
- Land appropriation and improvement by the local authority or a public land developer, followed by buildable plots resale to builders and end-users. This is the public development method which we mentioned in the previous chapter. The price difference between initial raw land (farming land, industrial waste, etc.) and improved land covers, totally or partially, public infrastructures and services expenses.
- Charging fees and planning obligations (called collectively “contributions” in this chapter) to developers in order to cover public expenses, but without the local authority appropriating the land. We will develop this method in more detail later on in this chapter.

Average cost or real cost?

When the local authority decides to charge infrastructures and services expenses to beneficiaries, it must choose in which way the contribution is calculated. Is it the "average cost" of public investment usually corresponding to building a new home[19] in the area? Or is it the “real cost”, i.e. public expenses specific to a particular neighbourhood? In the latter case, real costs may be quite different depending on the neighbourhood. As a matter of fact, each neighbourhood already has a particular level of equipment. Consequently public expenses for additional infrastructures and services[20] may be very different.
With the average cost, the contribution will be the same across all neighbourhoods. With the real cost, contrary to the average one, contributions may vary significantly from one neighbourhood to the next.

Which system, average cost or real cost, is the fairest? Such question is mainly theoretical. Indeed, real cost valuation often is contingent and depends on the random succession of operations over time. But looking at the bottom line of this issue, and considering that all citizens are equal before taxation, it is also fair to say that everyone is entitled to the same public services, which should be financed by public budgets: for public facilities, use public money! In these circumstances, only the catch-up principle would be justified and charging direct beneficiaries should remain exceptional.

In fact, local councils have come to charging beneficiaries not so much for ethical but for pragmatic reasons. On the one hand, there is a well-identified public expenditure needing to be financed, and on the other a change in land status that generates capital gains. How then directing some of these capital gains towards financing infrastructures and services in order to alleviate public budgets? Charging equipment expenses to beneficiaries is the logical answer. Secondly, choosing between average cost and real cost is a matter of efficiency. The average cost system is easier to manage. As rules are the same for all, legal guarantees do not have to be too elaborate. However it is not as efficient because the contribution affects similarly all operations, whereas land values may be very different. It cannot be too high, for fear of blocking the least profitable operations.

The real cost principle applies to land without the required equipment level and at a lower price. Contributions can therefore be higher without any risk of paralysing operations. This system

[18] A third method, which we will not discuss here, is billing directly the provided services (for example, water supply) when it includes the initial investment amortization.
[19] The reasoning is the same for premises, offices and trades. But public services needed by activities are generally less frequent than those driven by new inhabitants. Furthermore, local governments often seek to attract jobs and consequently tend to charge activities less.
[20] This real cost could also be considered a marginal cost because it is based only on extra equipment needed at the fringes of the existing stock.

can be fine-tuned on a case by case basis to find the best return for the local council, as rules are specific to each neighbourhood. It can also be negotiated with the developer to determine what is acceptable for the forecast balance sheet, whereas the average cost system applies a uniform and non-adaptable rule. But in return, the real cost principle requires more legal guarantees, as contributions differ from one neighbourhood to the next and therefore should be justified. Such an exception to the citizens' equality before tax principle entails some formal requirements. The local authority should display the planned public investment programme and commit to carry it out, in order to avoid repaying contributions in case of non-achievement. The principle of equality of all in relation to the discharge of public burdens has, in many countries, led the legislator and judges to apply the notions of "direct link" and "proportionality". "Direct link" means that public infrastructure and facilities to be paid by developers are necessary for their new developments. They must really benefit future residents, so contributions should not be used for other purposes or for investments that do not profit the new neighbourhood. "Proportionality" implies that operations contribute to public infrastructure and facilities according to new residents' interest. In the case of several operations sharing the same infrastructure, each one of them should only be charged proportionally according to the infrastructure forecast use (or proportionally to its built floor space).
Contributions calculated according to the real cost method are therefore more complex to implement. They require a strategy and preliminary studies to define the public investment program in advance. However local authorities use them for all significant urban developments because they find them more financially profitable.

The average cost method applies rather in common urban fabrics already serviced, where public investment catches up rather than precedes urbanization. The relationship between investment and new beneficiaries is not direct. The contribution feeds a general public budget without being assigned to a particular infrastructure or facility (it is a tax more than a fee).

The chargeable event of contributions to urban infrastructures and services

Public equipment beneficiaries are part of a landowner-developer-purchaser chain. In general, the local authority will seek to charge landowners or developers and those in turn will try to pass the burden onto the next party in the chain: landowners to developers, developers to purchasers. But if purchasers are not able to pay more than a given price[21], developers will try to lower their bid on the land and have the landowner absorb the contribution. From the local authority's standpoint however, it is more logical (and moral) to ensure that equipment costs are passed on to landowners who benefit from unwarranted earnings ("unearned increments") that are neither the result of work nor risk taking.

When contributions to public investment (planning obligations, fees) are charged to builders (professionals or individuals), the chargeable event is the building permit. Developers then try to pass on contributions to home buyers by increasing selling prices. But they can only do so if buyers can afford it. Therefore, they will generally seek to charge landowners indirectly by reducing the land purchasing price, as we will see below.

When landowners are charged directly, the chargeable event is their plots' servicing by public streets and utilities. Generally they have to pay it whether or not they apply for a building permit. If they do not want to pay the contribution, they can relinquish their ownership right and force the local authority to purchase it. The question is then whether the purchasing price is the previous use one (when the land was not serviced and not constructible) or the future use one.

[21] In other words, when demand to price elasticity is high, which is the case in ordinary housing market segments.

This landowner's levied fee system is often coupled with compulsory land consolidation, decided by the local authority or by a qualified owners' majority (for example, two-thirds of landowners owning two-thirds of the land surface).

What is the outcome of contributions increase?

- If the building rights (regulatory density) are unchanged, the developer tries to pass on the cost to purchasers. New dwellings may not be sold because demand to price elasticity is strong for low and mid-range housing (a small price increase leads to a sharp decrease in demand as purchasers are no longer able to get bank loans).
- If the local urban plan is changed in order to increase building rights, land prices remain more or less stable. By displaying the planning obligations before any change is made in the local plan, one can stabilize land market prices.

It is therefore more suitable for the local authority to display the contributions beforehand so that developers can include them as expense in their forecast balance sheet and then, as a result, make an adequate offer to landowners. And in order for these contributions to be accepted, they must be established and made known when the local urban plan determines building rights. Otherwise, if land prices had already been set according to future use, developers would give up the whole operation and landowners might sue the local authority claiming one reason or another.

Perimeters

Each public facility services a given area:

- the entire agglomeration for a theatre, an hospital, a ring road, a public transport system;
- a neighbourhood for a school, a green space, a sewage collector;
- a street for utilities.

Likewise, each contribution system may be applicable to a specific area. Contributions based on the average cost generally apply indistinctly throughout the local authority's territory. Real cost contributions apply to a particular perimeter or even a single operation. In this respect, it is necessary to distinguish between specialized and generalist contributions.

Generalist contributions are used to finance all kinds of infrastructure (roads, networks, sewage plants, etc.) and public facilities (schools, social and cultural centres, sports and leisure facilities, etc.). Specialized contributions cover only one equipment category, for example, sanitation, drinking water, schools, roads. In this case, a given plot may be affected by several contribution schemes, each having a different perimeter.

Some contributions are cumulative and others are not. The principle is that the local authority cannot charge for the same thing twice. Generalist contributions cannot therefore be cumulated with average cost contributions because they are intended to cover all categories of urban equipment. On the other hand, specialized contributions can be cumulated with another one as long as it does not relate to the same kind of equipment (for example, a contribution related exclusively to streets and utilities can be cumulated with a contribution related to public facilities such as schools or sport grounds).

Land use language or real estate language?

When it comes to contributions' base, are we talking about land surface (land use language) or about floor space (real estate language)?

When dealing with professional developers and builders, we talk about floor space in real estate language because that's what they make and sell. Their contributions to public services and infrastructure are based on the actual floor space to be built according to the building permit and not on the land surface, not even on this land surface multiplied by a theoretical statutory plot ratio.

In contrast, landowners, even if they are building for themselves, are not familiar with the concept of floor space. They only know their plot's land surface. So their contributions are based on the plot's surface area, according to land use reasoning. This surface area can sometimes be weighted by the statutory plot ratio.

The land use language works well when the local authority's counterparts are small plots private owners. When they build for themselves or their families, experience shows that they do not always use all of the available regulatory density. If contributions were based only on floor space to be built, the local authority would incur a financial loss because of the gap between expected and actual revenues. Land use reasoning and language avoid this pitfall.

Professional developers naturally seek to make the most of a constructible plot by taking advantage of all its regulatory possibilities, at least if the local market accepts such a density. It is therefore easier to predict the behaviour of professionals than the one of individual landowners who build for themselves.

By using the real estate reasoning we can differentiate contributions according to constructions' types, for example to cross subsidize social housing. Land use reasoning doesn't allow for such cross subsidizing because we don't know what will be built. However, this land use reasoning may indirectly benefit social housing which is generally denser (building more floor space on the same area of land).

Unilaterally fixed fees or negotiated obligations?

The nature of the local authority's counterparts also determines the kind of relationship: unilaterally fixed fees or negotiated obligations.

If the local authority's counterpart is a moral or physical person with enough financial capacity to undertake a significant urban development, negotiation is then the favoured type of relationship. Negotiating is not only towards public services and infrastructure and their financing but also towards programme, density, proportion of social housing, architecture quality as well as green spaces, energy performances, etc. The developer's ability to support the services and infrastructure costs depends on these other elements, in particular the building rights (i.e. the density) granted by the local authority.

When the local authority's counterparts are in greater number and locally spread out, the relationship is one-sided. The local authority not only sets the rules but also commits to build public services and infrastructure, whereas landowners and developers do not commit to anything.

When negotiating planning obligations, the upper limit is set applying direct link and proportionality principles. But in practice, even respecting these principles, the local authority keeps some flexibility to modulate obligations. On the furthest side of the spectrum, the local authority may do without contributions from developers and only rely on catch-up funding from ordinary tax revenues. Alternatively, they may charge the full cost, including studies, management and financial expenses. And we know that the wider the scope of development, the larger and the more expensive the public services and infrastructure are. Between these two extremes, the local authority has some leeway to choose what to charge developers. For

example, they can happily charge infrastructure expenditures only while paying for schools and other social and cultural facilities (in which case the direct link and proportionality principles may be harder to justify because they may be of other neighbourhoods' inhabitants' interest). In short, the local authority is often able to modulate and adjust obligations when negotiating with developers. They do so in order to save taxpayers' money but also to try to influence land prices.

Interactions with land prices

As we have already pointed out, contributions to public services and infrastructure expenditures have an effect on land prices because the developer adjusts his forecast balance sheet with the amount of money he can offer for the land. From the developer's standpoint, the fact that his land budget can be broken down into land to be paid to the landowner and contributions to be paid to the local authority does not matter. What is important is for the total amount to be spent in order to get building rights on the land plot. For these two positions, he has a single budget, the amount of which is determined in a residual way by the countdown. Land price and contributions therefore work in communicating vessels. If contributions increase, the land price must decrease and vice versa. Seen in this light, contributions appear as a levy on capital gains, a levy which is then allocated to public facilities.

Financing public services and infrastructure is therefore indirectly a land policy tool (even if it is a tool that lacks flexibility over time). And this tool is all the more effective because it uses a technical language with no ethical concern. Indeed, the need for building services and infrastructure is undeniable and can be understood by everyone, while the moral arguments in favour of unwarranted taxation earnings (economic rents) are not always politically or ideologically accepted.

But for the levy on land capital gain to take place, some conditions must be met. First, the rule should be displayed in advance so that developers include it into their forecast balance sheet (countdown) before making offers to landowners. If developers discover this rule after having negotiated and signed purchase agreements, they may have troubles to convince landowners that the land price should be reduced accordingly. And it is safer to display it before land price references are established, for example before the planning document grants building rights to the plots. If financial planning obligations are displayed after the local plan granted building rights, transactions may be blocked for a few years, the landowners trying to get what they consider to be the true value of their land.

Then, for the impact on land property prices to be real, contributions should not be carried over to housing buyers. In other words, housing demand must be elastic in relation to price, meaning that a small increase in the housing selling price should result in a sharp fall in demand. This happens when households have only a limited budget and when government subsidized loans granted to them on the condition that the purchasing price doesn't go beyond any administrative cap. In the case of ordinary neighbourhoods, developers cannot have homebuyers support the cost of planning obligations. They must convince landowners that they should absorb such costs through a reduced selling price. However in smartest residential areas, a small increase in real estate prices has only a minor impact on the rate of sales: there will always be buyers. In these sectors, where demand is less elastic in relation to price, it is easier to move over costs to homebuyers.

The impact on property prices of displaying planning obligation varies also over time. It depends on the real estate economic situation. When the economic cycle goes up, it is easier to add expenditures to the balance sheets. However displaying planning obligations in advance isn't always enough to limit the land price increase, because such planning obligations alone should be able to absorb the leverage effect of real estate on land. Conversely, in the

downward phase, planning obligations may block operations. Indeed they should logically decrease in proportion to the leverage effect in order for operations to be balanced, despite the property sales prices decrease. In the countdown example below, from chapter two, planning obligations should be multiplied by three to absorb the leverage effect following a 20% real estate price increase. In the economic downturn, these planning obligations should be changed again, this time lower, to avoid blocking operations. However it is more difficult to adjust a physical service and infrastructure programme, which are the only legal basis for planning obligations, according to the current economic situation.

LAND MARKET CONTROL AND DEVELOPER'S COUNTDOWN

		270
	LAND	
		630
270		
210	***CONTRIBUTIONS***	
		120
120	*IMPROVEMENT*	
900 *30 %*	*GROSS MARGIN*	*1 080* *30 %*
1 500	*BUILDING COST*	*1 500*

*Real estate market: 3**000 €/m²** floor space* *Market: **3600 €/m²***

In this example (similar to the one in the second chapter), contributions have been increased in order to stabilize land prices. But for a 20% increase in the real estate price, contributions have to be tripled if one wants to keep land prices at their previous level.

Contributions adjustment is a delicate task requiring the local community to have an accurate knowledge of the real estate market. This adjustment determines the land value gain shared between three parties: the landowner for his wealth, the developer for his profit margin, the local community for their financial resources intended for public services, infrastructure and social housing. Excessively high contributions cause land prices to fall below acceptable levels for landowners. Conversely, too small contributions would bring additional rent to landowners and would result in higher land price references. The display of contributions should therefore be considered both strategically and tactically, not only space wise but also over time.

Strategy and tactics: small or large perimeters?

Such is the demand for improved land during periods of after war reconstruction or of urban explosion driven by industrialization that ambitious development plans may be designed without taking much risk. But in times of slow growth, urban development is no longer as commercially sound. It involves heavy infrastructure costs that can only be paid back in the

medium or long term. Such infrastructures often have a "threshold", meaning that they must be built in one go before any urbanization can proceed. These cannot be implemented on the go, as and when needed by new constructions. This is the case, for example, of a main access road, of a watershed rainwater collector, of a new sewage treatment plant, etc. In short, cost of entry is often high in urban development.

The local authority, or the public development corporation, must think and act in the medium or long term while their visibility of the future, meaning their ability of forecasting events, is low or nil. Their partners, builders and private companies, reason in the short term. The private builder starts his operation only when he is sure to be able to market it. The private company should react quickly according to its market. Settling in new premises and starting production should not take more than a few months. In the context of the current heightened national and international competition, response time is essential to business survival. We moved from forecasting urban development fairly accurately to indefinite development which outcome we cannot easily predict.

There is therefore a gap between different parties' time horizons: long term thinking for public urban planning and development, short term thinking for housing and activities' premises markets. Only public bodies, or a few large corporations supported by long-term financing (such as pension funds), can bear long term risks and manage the difference between markets and urban planning development time horizons.

Confronted to such uncertainty, local authorities may be tempted to short term thinking, i.e. engaging only in small and quick urban developments and building infrastructures and public services only when needed. This is the method of urban development in the outskirts of existing built up areas, catching up progressively with the infrastructure level, which has been universally practiced for centuries. However this method tends to produce a sedimentary and poorly structured urbanism, lacking overall urban design. Financially, this is an expensive method for the community because the too limited scale of development doesn't allow to identify sufficient public investments to be charged to developers while respecting the direct link and proportionality principles. The result is higher land values which benefit to landowners who contribute little or not at all to public expenditures.

The only way to achieve both a coherent urban planning and a substantial capital gains recovery is to provide for large planning areas. The infrastructure programme is then big enough to give the local authority a robust argumentation for calculating contributions according to direct link and proportionality principles. The cost of this programme represents the maximum of what the local authority can impose and legally justify. The larger the perimeter, the higher this maximum level and the wider the room for manoeuvre to modulate contributions.

But a large perimeter also entails significant financial risks for the local community who is betting on the future. There is the risk of a mired public urban development, forcing the community into playing the role of a land bank (land piggybacking). Also the risk of temporary over-investment in infrastructure in the case of a too large urban development project, not proceeding at the rate initially predicted. Remember that in a unilateral contribution system, the community makes the commitment to carry out the infrastructure program within a set time limit, but is the only one to commit. Landowners and developers have the choice of the moment and can decide not to follow the local authority's initiative. Furthermore, large urban developments take place over long periods of time so that their conditions of implementation and their financial balance are likely to change along the way. When it is necessary to pre-finance land acquisitions and infrastructure projects with positive real interest rates (excluding inflation), real costs can in fact cancel out the benefits of an operation thought globally.

Is there therefore no alternative between, on one hand, succession of small, uncoordinated operations costly for the taxpayer, and, on the other hand, large urban developments that put the community excessively at risk?

No method can remove urban planning uncertainty. But nothing prevents thinking both long-term strategically and short-term tactically. Long term: the general planning scheme is drawn up, the services and infrastructure program is outlined, and its cost is estimated. The average contribution per floor space m² is thus known. It can be displayed so that developers take it into account before signing agreements to buy raw land (non-serviced) to landowners.
But this contribution display should not be legally binding so that the community doesn't commit to it more than necessary. Operational phases are then launched only when they become commercially viable in the short term.
These operational units share the main infrastructures. Their phasing should be prepared in advance taking into account existing infrastructure residual capacities, new groundworks thresholds and the technical compulsory linkages between them (for example, sections of sewerage systems where effluents flow by gravitation). The aim is to limit premature technical obsolescence and financial costs risks by avoiding pre-financing of pending and unused capacities. In the event of land use hazards the phasing should allow some flexibility. But building rights and planning permissions are granted to operational units only when they are ready to start. Constraints imposed by the local authority on each operational unit are fine-tuned according to the current market situation.

Displaying future contributions on a large scale may help moderate land prices. But we have seen that such displaying will not be enough to stop cyclical variations. Long-term contributions displaying is certainly beneficial for public budgets but, in itself, doesn't make a land-use policy. Only improved land and real estate products supply can really mitigate cyclical variations.

CHAPTER 5: URBAN PLANNING AND BUILDING RIGHTS

We have distinguished above intentional planning and spontaneous urbanism. The latter is achieved following diverse actors' initiatives without coordination, by construction along existing access routes. On the contrary, intentional town planning is preceded by a plan which, even if it is not drawn on paper or any other material support, may be traced directly on the ground. First urban plans were essentially subdivisions outlining plots to be built while leaving enough space for roads, streets, and public spaces and facilities.

Spontaneous urbanization is generally carried out at a relatively slow pace. If it is to accelerate under a surge in demographic pressure, it may result in disorder that compromises the future city's functioning. When the pace of urbanization speeds up, a preliminary plan becomes necessary, to impose a minimum order on multiple actors' building initiatives.

Starting originally as a simple land subdivision, urban plans have been upgraded over time in content and accuracy while covering larger scales. Their status has also diversified, some are just indicative, or even informal, and others are binding or even mandatory. Depending on their status, they include more or less leeway for negotiation with the local authority. But are these urban plans sufficiently comprehensive to directly monitor development operations? Isn't an intermediate step necessary to ensure transition from spatial planning to operational construction projects? These questions are related to the evolution of urban planning documents: can they be stable over time, or must they be constantly modified to adapt to the changing conditions of the economic, social, cultural and technological environment?

Finally, as we saw in a previous chapter, urban planning, by establishing plots' building rights, determines their value. It raises the fairness issue: between landowners themselves because some take advantage of building rights and others don't? Between taxpayers who pay for infrastructure valuing land, and landowners who benefit from unjust enrichment?

Urban planning scale

Urban planning documents apply to three geographical scales: the urban area, the perimeter of the local authority responsible for urban planning, and finally the operational detailed plan for a district or block.

The urban area

The urban area may be a continuous physical agglomeration (conurbation) that ignores the administrative boundaries of municipalities. But more often, it also includes agricultural and natural spaces separating neighbourhoods and towns or villages, which then make up a discontinuous urban area whose geographic border is based on functional criteria such as employment market, or travel-to-work area.
The initiative of regional or conurbation planning belongs to either an institutional level superior to local authorities (such as region or department) or on a group of local authorities linked on a more or less voluntary basis and within a framework more or less institutionalised.

Local authority's scale: the local urban plan

The local urban plan is the ideal standard instrument of urban development regulation by the political and administrative level responsible for it. Technically, the local authority can legitimately establish it because of its local knowledge and closeness to parties. When it is elected by direct universal suffrage, it also has a political legitimacy that can justify landowner's unequal treatment (because building rights, i.e. land values, are granted at the local urban plan

level). However if the local authority has some leeway to establish the local plan, it must take into account general planning laws and meet the regional or urban area's plan requirements.

The detailed plan

The detailed plan, on a neighbourhood or block scale, is more operational than the regional and local plans. It directly prepares operations that will ensure urban fabric transformation. This detailed plan may be established unilaterally by the local authority and then imposed on developers. On the other end of the spectrum, it may be suggested by developers and accepted by the local authority who will integrate it into the local plan. Between these two extremes, the detailed plan is more generally the result of negotiation between local authority and developers. The local authority may fix invariables, meaning non-negotiable issues, and let developers suggest complementary provisions relating to urban shape and construction program. The local authority may also be content with issuing non-binding guidelines only, which can then be challenged by developers' argumentation.

When the detailed plan is negotiated, it is in principle accompanied by a development contract which sets out both parties reciprocal obligations. We will see in the following chapters how the detailed plan is implemented, either directly by the local authority ("public development"), or by one or more developers bound to the local authority through long-term contracts ("negotiated development"), or by landowners themselves complying with the local authority's unilaterally enacted plan ("regulatory incentive").

Depending on the country, the detailed plan must be compatible with the local urban plan or it may disregard it. But in the latter, its approval follows a similar procedure to the one of the local plan, in particular for citizens' information and for public entities gathered by the same interest in it.

Planning document's content

The planning document usually includes at least three sections:
- Land purpose,
- Infrastructure and public and private facilities locations,
- Building regulations.

The exact content and the degree of precision will be linked of course to the geographical scale covered by the planning document. They vary depending on whether the document is regional, local or detailed.

Land purpose

It appears on zoning maps to specify land plots' current or future use:
- farming and forestry production,
- environment, wild recreational areas, and listed buildings and heritage sites protection,
- infrastructure, public and private facilities,
- activity and / or housing,
- farming areas planned for future urbanization.

The regional plan specifies global zonings but not to the point of showing registered plots. As a result, a landowner cannot always determine the allowed use for his plot. However, the local urban plan being generally drawn on the cadastral layer, it allows it.
The detailed plan is even more precise and mentions the construction program to be carried out and the plot ratio on each parcel. This way, developers may know the floor space they can

build on each land unit for the different types of real estate products (non-subsidized and social housing, business premises, offices, shops…).

Infrastructure and facilities locations

The regional plan also specifies forecast locations for major infrastructures and facilities (motorways, hospitals, universities ...) whose responsibility is taken at a higher level (Region, State) than the local authority's. Again, that kind of plan is not precise enough for a private landowner to know for sure if his plot will be expropriated.

The local urban plan is more precise and specifies future infrastructure and facilities layout, at whatever government level of responsibility for them (local, regional or national). The scale and the precision of the plan allows landowners to know if their plots will be expropriated. In some countries the local plan is equivalent to a compulsory purchase order (CPO) and landowners are then able to formally notify the government's level of responsibility for the infrastructure or facility, asking them to buy their properties at market price. If the public authority doesn't respond within the expected time frame, the CPO equivalent is then considered invalid so landowners are free to use their plots according to the neighbourhood's building regulations.

The operational detailed plan is even more precise. It specifies exact locations for future infrastructure and facilities so that landowners can know how much of their land will be taken for them.

Building regulations

Building regulations in planning documents define quantitative limits or mandatory values for buildings such as height, footprint (as a percentage of the plot area), the distances to plot boundaries and neighbouring buildings, as well as which proportion of the surface area is to be left in its natural state...
Other more qualitative prescriptions may also be mentioned: roofs slopes, materials to be used, vegetation types...

These rules do not refer to architecture. Indeed, judgments on architecture are subjective and vary according to fashion. It is therefore difficult, if not impossible to define in writing what the right architecture should be, except sticking to rather vague requirements such as "good insertion in the site" or "respectful of regional styles".

The regional scale document is too general and too broad to include building regulations adapted to every sector. At most, it may include recommendations to encourage space saving and constructions' energy efficiency.

The local urban plan includes a construction bylaw that allows builders to calculate precisely the amount of floor space they can build on each land unit. The basic rule is the plot ratio, which is the buildable floor area within the land surface. For example, a 0.6 ratio means that 600 m² floor space can be built within a 1000 m² land surface area.

The plot ratio is a fairly simple provision that immediately gives residents and their elected representatives, in comparison with existing urban fabrics, an appreciation of future density. The plot ratio also facilitates economic reasoning because the land value is calculated directly (through the countdown seen in chapter 2), assuming that other rules are not affecting it. It allows the local authority to encourage social housing, energy performance or contribution to public facilities by granting higher density in exchange. It also allows in some cases to restore equity between landowners by transferring density from the most constructible plots to those that are less constructible (see the section on equity below).

However, in existing dense urban fabric, the plot ratio is not a suitable rule in order to maintain harmony with existing buildings. One favours "contextual" rules, established according to whatever already exists. Such rules can be visual, where a dimensional drawing replaces the written rules in order to visualize volumes where future buildings will have to fit into.

But “contextual” rules are not without risk: they tend to generate uniform urban shapes, "corridor streets" in which all buildings have the same height and a strictly rectangular facade hiding what is inside the block.

Moreover, when the rules’ consequences have not been thought through for each plot, developers' efforts to achieve maximum floor space by making the most of all legal possibilities may lead to unforeseen and unwanted results (for example, massive buildings blocking the light and the sun to neighbours). Then, in some cases, the local authority might restore the plot ratio but setting it at a level below the density that would result from other rules (in particular, height and footprint). This encourages diversity of construction, which respects harmony throughout. It makes way for discussions with developers and architects.

However relevant and precise, contextual rules do not prevent consultation between the local authority on one side, and developers and architects on the other. The plot ratio, by determining in advance the available floor space, does away with the operation economic balance concern, so that discussions on urban design may then proceed serenely (see hereafter, the unavoidable incomplete nature of planning documents). The plot ratio is a way to encourage social housing or energy performance by granting them a higher density.

The plot ratio tool is less used in operational detailed plans. However the allowed floor area per block or per land unit can be displayed directly on the detailed plan because more in-depth studies have been carried out. One or more developers often have an advisory role with the preliminary studies, if they do not draft them directly, and the final urban design is the result of this consultation. The rules will be directly inspired by the project and then incorporated in the detailed plan or in a contractual document.

In these operational sectors, if the local authority already owns all or part of the land, urban planning rules may even be simplified and remain open. Urban design orientation and control may be done on the occasion of ownership transfer to developers through contractual specifications.

Which binding force?

Whether an urban planning document is in place or not, construction is generally subject to administrative authorization (building permit, planning permission). What is the relationship between the planning document and permits being issued? In this respect, we can distinguish three different statutes for urban planning documents: indicative, legally binding, mandatory.

Indicative: The authority issuing the building permit is not fully bound by the planning document; it retains some discretionary power; however, it will probably have to justify why a permit is denied in an area planned for urbanization.

Legally binding: A building permit application that complies with the planning document prescriptions cannot be withhold; the local authority’s discretionary power is greatly reduced once the planning document takes effect.

Mandatory: Landowners must build within a certain time limit according to the plan’s prescriptions. If they do not, the local authority may take over and expropriate the plots to have them built.

Country	Regional or conurbation plan	Local urban plan	Detailed plan (operational)
Germany	*indicative*	*indicative*	*mandatory*
UK	*indicative*	*indicative*	*indicative*
Spain	*indicative*	*binding*	*binding*
France	*indicative*	*binding*	*binding*
Italy	*indicative*	*binding*	*binding*
Sweden	*indicative*	*indicative*	*binding*

Regional or conurbation plans are usually indicative only: they are not precise enough to issue building permits. However they may indirectly affect how permits are issued because local urban plans must be compatible with regional or conurbation schemes.

Sometimes regional planning documents consist of independent thematic schemes: transport infrastructures, environment, energy, industry, agriculture, water ... Each scheme evolves at its own speed and therefore inconsistencies may occur between them. For example, the environmental protection scheme may temporarily contradict the one of transport infrastructure.

However when all themes are simultaneously taken on board in a single planning document, it considerably wears down and delays the process, as it has to reconcile and combine many contradictory interests and standpoints. Furthermore, such thorough planning document may become obsolete as soon as it is finally approved. Or it may be reduced to an empty shell, becoming no more than a list of good intentions that will be of no help at all in making concrete decisions.

Local urban plans are the reference document for issuing building permits. Depending on national systems, they may be legally binding or just indicative. When merely indicative, legal effectiveness may lie in operational detailed plans.

These operational detailed plans are even mandatory in some cases. However, landowners may simply have to readjust the land and financially contribute to streets and utilities works carried out by the local authority, without having to build before a given deadline (see the chargeable event of contributions in the previous chapter). But once they have paid for land consolidation and streets and utilities, they generally start building or sell their serviced plot to a builder.

Legal urban planning documents may be supplemented or replaced by informal documents and plans without any legal value, but which embody a political will or an agreement between central and local governments, and provide urban dwellers with information about future planning and development options. Such informal documents often have a contractual element providing for financial contributions to future urban investments from various public and private parties. But being not legally binding, these contractual documents are not subjected to any courts' jurisdiction. Sanctions are more of a political nature: any broken promise cost voters. Or they may occur when a funding partner pulls out when the others do not fulfil their obligations (for instance, the community may not build any public infrastructure if developers do not start construction on schedule).

Such informal planning documents are not subjected to legal, administrative and litigation procedures. This is an advantage compared to formal documents which must follow long and complex procedures, as they have to take into account conflicting interests from actors or groups who are increasingly seeking arbitrations in courts.

Can the urban plan be comprehensive?

Can the local urban plan, on the basis of which building permits are granted, provide for all specific cases that may arise? Can it be a comprehensive document able to give a clear answer to any eventuality, and thus meeting the local authority's expectations, in particular on the following points:

- Construction programme: social housing or business premises shares, housing types (large or small houses or apartments), selling prices, etc.;
- Environmental quality, buildings' energy performance;
- Schedule to minimize disruption of the current socio-demographic structure of the district or the city and to adapt to existing public facilities (such as schools) remaining capacities;
- Urban design, public spaces lay out;
- Utilities technical characteristics;
- Financial contributions to social housing and new public infrastructures and facilities;
- Heritage protection and enhancement;
- Land prices in order to prevent any increase that would then make community's land purchases more expensive?

Anyone who has practical experience in urban planning would know that such an objective is illusive. Planning documents authors are after all mere mortals, subject to "limited rationality". The plan and regulations cannot anticipate all possibilities. For example, what will be the outcome of fit-for-all rules applied to irregular shaped land parcels? Moreover, in order to protect citizens from encroachments by local authorities, the general law often makes an exhaustive list of all the points they are entitled to regulate. Finally, urban design ideas and political choices are constantly changing.

Simple projects, such as a single house built by a household, fit seamlessly into a local plan. But for more complex projects, the planning document's regulations may be inappropriate if too detailed. This is when local authority and developers have to collaborate. This joint development work may be of two kinds: "discussion" (without any change to the planning document) and "negotiation" (in which case the planning document may be altered, such as an increase of density).

Discussion about a planning permission application does not question the planning document itself but its interpretation. This can lead to lowering the developer's expected income (in case of less floor space to build, or cheaper housing to be sold) or increasing expenses (depending on the quality or energy performance requirements). If the local urban plan was legally binding, the developer could theoretically consider that they are entitled to have their project accepted, as long as it complies with the by-law's letter, regardless of the local authority's reservations. In reality, given the complexity of the administrative and litigation procedures, the local authority is fully able to increase the developer's transaction costs to the point of reducing their profit margin to almost nothing. Conversely, in a positive way, the local authority is also able to reduce the developer's transaction costs. For example, it could accelerate the application processing, or be a mediator between them and any neighbours worried by their project and threatening to sue, or to convince reluctant landowners to sell their plot.

Negotiation, unlike simple discussion, leads to urban planning document changes and public enquiry so that city dwellers can comment on it. Local urban plans, even when legally binding, forecast areas in which by-laws are explicitly incomplete and are open to negotiation (or public development on the local authority's initiative). When expanding on agricultural or natural grounds ("greenfield"), future urbanization zones are unbuildable pending an overall plan and infrastructure program. In already built-up areas ("brownfield"), the local plan may temporarily

freeze perimeters intended to be renewed deeply. In this case and pending the restructuring project, the local plan maintains the previous purpose (for example, industry) with a low plot ratio allowing only to adapt buildings housing to its pre-existing use.

In such greenfield and brownfield the local authority's ability to modify planning documents and generate new building rights (i.e. to create value) gives it a bargaining power towards developers and landowners. However it no longer have such power in already buildable and serviced sectors. Because of such power this needn't threaten developers to increase their transaction costs in order to obtain their cooperation.

This negotiation is bilateral or trilateral (triangular). Bilateral bargaining is between local authority and developer, the latter dealing directly with landowners. In the triangular scheme, landowners are also involved in the negotiation with the local authority. They are thus notified of constraints imposed on developers by the local authority (such as proportion of social housing, contributions to new public infrastructure and services, energy performance, etc.) and are aware of their impact on land prices. The local authority may also put pressure on them, by threatening to leave the land in its current unbuildable status, in order to have them sell their plots at a price compatible with the operation economic balance. However the local authority's power towards landowners depends on space available for urbanization. If space is abundant, the local authority can pit them against each other and favour the most cooperative ones. On the other hand, if space is scarce, the balance of power goes to landowners (unless the local authority is able to set a property tax on owners retaining their land).

In terms of principles, negotiation doesn't always respect citizens' equality before law and public burdens. Indeed, negotiation in urban planning is rather for "big fish", whereas "small fish" must fit into unilaterally established regulations. This is why it is advisable to define in the local plan areas where negotiation will take place, to clearly specify non-negotiable points (invariants) and to ensure transparency of contracts between the local authority and the developers. Such contracts should be publicly displayed.

On greenfield the local authority will indeed have a maximum bargaining power if it has not displayed in advance plans for urbanization. But this practice, in addition to violating citizens' right for information, is also harmful for agriculture. If farmers feel that the whole land is likely to be developed one day, they will no longer invest in soil fertility, and may avoid selling their fields to young farmers who would ensure sustainable agriculture.

Finally the local authority is in the best position for discussion or negotiation when it owns all or part of the land needed for the project. The contract granting the right to use the land (freehold or long-term lease) sets in stone specifications following negotiation between developers and local authority. In many cases, "land banking" by local authorities is intended more to control projects' quality than to put downward pressure on land prices. The local authority's bargaining power will no longer rely on the "carrot" of urban plan manipulation and the "stick" of transaction costs increase. Urban planning documents fixing land rights may then be more stable. However, as they are not comprehensive, they are still subject to evolution.

Stability or scalability of the planning document?

Planning documents' stability is an ideal sought by all parties involved in urban development, from ordinary citizens to big developers, because everyone needs to know the city's future in order to support their life choices and their investment strategies. Conversely, a structurally unstable document suggests that rules are not sustainable and may be changed according to circumstances or the balance of power.

In practice, urban planning document's stability depends on the degree of legal effectiveness and level of detail. An indicative document leaves room for interpretation (and arbitrariness). It does not need to be revised frequently. On the other hand, a legally binding document establishes rules which both builders and local authority must comply with. Proposed projects may not be in line with what was forecast at the time of the plan development and this will often have to be reworked. Legally binding documents are inherently less stable than merely indicative ones.

However, the document may keep a consistent basis, with only marginal adaptations to concrete projects. If the procedure for drawing up and approving detailed plans is distinct from the one of the local urban plan, the latter may remain relatively stable. It will be used to manage slow changes in the city that do not involve radical urban fabric transformations, these being reserved for detailed plans. On the other hand, if the detailed plan is part of the local plan, modification or introduction of the first one implies modification of the second one. The local plan will be constantly evolving. One cannot hope to manage urban projects with a stable document.

The more detailed a planning document is, the more likely it is to be unfit for the real projects that are taking place. Accuracy may, in particular, prove to be blocking when the three levels of planning documents are nested, each document having to be compatible with the higher level. Consequently, changing a detailed plan may require changing the local plan too. And in turn, any change to the local plan may imply changing the structure plan as well, according to the same principle of ascending compatibility. One can imagine that the project will not proceed quickly enough to be in line with the real estate market evolution.

In some pathological cases the rule, wanting to foresee all particular cases at all cost, may become so complicated that it can only be understood and interpreted by its author. Such a complex rule opens the door to it being arbitrary or incoherent, in direct opposition to the initial goal of securing parties' institutional environment ("too much law kills the law ").

The detailed plan must be the most accurate document as it frames an operational process. In this respect, we should distinguish two situations depending on whether the detailed plan is defined in advance before the project, or established afterwards in accordance to the project.

If the detailed plan is designed in advance (a priori) by planners only (and not developers), it is advisable to limit it to principles that must remain intangible (invariants). It should be all the more succinct as it is binding, otherwise it would block operations, or delay them because of the need for a changing procedure with public inquiry.

If the detailed plan is drawn up in consultation with a developer (or even if it is simply suggested by the developer to the local authority that accepts it as it is), it may be more specific because it has been validated by a project holder able to implement it. Without going as far as buildings' architectural design, the detailed plan can draw urban streets, roads and public spaces lay-outs as well as constructions' envelope volumes. This urban design step stands between planning and operations. Project details may be included in a contract between the local authority and the developer. But publicly displaying such details meets the inhabitants' demand for information. And if the detailed plan is legally binding, it sets in stone the agreement obtained on the project's characteristics, making it more difficult for the developer to transgress it later.

Legal or political regulation?

The distinction between legally binding and indicative also refers to the difference between legal and political regulation. The latter means that local politicians will be sanctioned in elections if they do urbanism badly. If we stick to the political regulation, urban planning documents can indeed remain indicative (without legal significance) and not as formal as to when it comes to applying rules.

Legal regulation implies that local planning rules have force of law and that offenders, be they individuals, developers or the local authority, may be sentenced in court. Legal regulation does not do away with political regulation (at least in countries where there is local democracy) but it suggests that citizens do not believe politicians will ensure urban planning quality, possibly suspecting them of being unfair or incompetent. They prefer a clear display of rules applicable to all.

A small size local community whose elected officials are close enough in daily life to inhabitants and landlords may want a precise and stable rule behind which they can protect themselves in the face of pressures from voters. The alternative between political and legal regulation is also to do with the general conception of law: the first plays a more important role in Common Law countries and the second in those inspired by Roman Law (see box).

Which planning document system is the most favourable to quality and economic efficiency? Legally binding documents are more expensive to develop for the local authority because requirements must be studied alongside their effects. On the other hand, they are expected to save transaction costs for developers who are aware of the building rules they will have to comply with. Developers are thus able to calculate what floor space area they can build, and set the price they can offer for the land.

Conversely, indicative planning documents are cheaper for the local authority, meaning less legal formalism and being content with succinct principles (with or without drawings). But they are more expensive for developers who do not have an accurate knowledge of rules and discover them as and when they apply for building.

The few available comparative case studies suggest that whatever the system, practices tend to come together and costs are balanced. Binding documents are far from stable in practice and rules in force are often starting points for negotiations, the outcome of which will be a costly urban plan modifying procedure, subject to litigation risk.

In indicative systems, absence of public rules is sometimes offset by private rules (e.g. private law specifications, or reservations expressed by insurance companies) which are even more expensive to change because they depend on unanimous agreement by private parties.

Finally it appears that urban planning quality and cost depend less on the formal system than on civil society’s demands, urban culture and local elected representatives’ will, as well as local authorities’ skills.

But whether indicative or binding, the urban planning rule is intrinsically unfair as it translates into very different private land holdings values.

Roman Law and Common Law

Roman law is a logical construction inspired by Greek philosophy. It is characterized by a concern for definitions, classifications (people, things, actions, according to the typology formulated by Gaius in the second century and taken up by civil codes of Napoleonic inspiration). In essence it is deductive: rules to be applied to specific cases should be deduced from main principles. Fundamental principles that may be regrouped in a rational codification (Theodosius's Code dates from 438). Countries inspired by Roman Law have also kept the distinction between private law, which governs relations between people, and public law which is supposed to protect individuals against public power encroachments. Private law is largely about contracts whereas public law deals with unilaterally established rules. In public law contracts are exceptions (because a contract between a public authority and a private person might be considered as one-sided (leonine), or discriminates between citizens by favouring some).

Common Law is, on the contrary, inductive: it is built on the basis of case law, of particular solutions to particular problems. It is wary of too general or too abstract rules established in advance. It is therefore not codified. Law is used primarily to define procedures. And if it lays down principles, these are integrated into law only when they have been interpreted and applied by courts. There is no real distinction between public law and private law.

Countries influenced by Roman Law and the Napoleonic Civil Code (In Western Europe: France, Italy, Spain, Belgium, the Netherlands) have adopted a local urban plan legally binding system: a building permit may not be denied if the application complies with the plan and accompanying regulations. Law defines exhaustively what the urban plan may contain and which documents are required from applicants.

In Common Law countries (mainly Great Britain and Commonwealth), local urban plans as well as detailed plans are not legally binding. They are just one element among others taken into account by local authorities to grant building permissions. Local communities may indeed rely on "material considerations" to deny an authorization even if the land is located in an area intended for urbanization by the local plan. It is up to the applicant to prove that his project is of general interest. The local authority may then ask for documents (such as environmental impact assessment) without the list of these being defined and limited by law.

Germanic and Scandinavian countries are in middle ground: local urban plans are not binding but detailed plans are.

In practice, we can observe how legal systems regulating urban planning converge towards each other. The Napoleonic Civil Code authors thought that by addressing any eventuality, judges could always justify their decisions through a piece of legislation. The Code would thus replace case law which means uncertainty for the litigant. In fact, this has not happened and case law as a source of law has not disappeared. Similarly, the idea that a binding urban plan could lock the future urban shape into a legal statement, thereby providing citizens and developers with increased security, has proven to be an illusion. In reality, planning documents established in advance are often unfit and consequently projects carried out by private parties are then translated into binding planning rules through local or detailed plan changes.

In some Common Law countries, recent laws are attempting to further secure planning permission applicants by stating favourable provisions towards urban development and by encouraging communities to grant permits more quickly.

Fairness

Building land value is directly related to building rights and to the density (plot ratio) allowed by the planning document (as long as it is accepted by the market). The local urban plan distributes wealth to landowners. But by granting different building rights depending on the sector, wealth is distributed unequally.

There are several ways to bring back some fairness between landowners whose properties are affected by a planning document:
- Capital gain taxation, annual property tax on buildable land, contributions to public expenditure on public infrastructure that directly upgrade property values;
- Purchase from the community of the right to build beyond a legally set ceiling;
- Density transfer with equal initial building rights allocation to all owners.

Capital gain taxation

Financial gain on land or property value, that is, the difference between purchase (or estimated) price and resale (or market) price, is taxed.
Please note that in this method the surplus value origin is not taken into account, whether it is building rights and density increment, or new infrastructures and services built by the local community, or general real estate price increase during the business cycle ascending phase... However the side effects of capital gain taxation are the following: slowing down supply on the land market, increasing land shortage which leads to higher prices. These effects are heightened when taxation is accompanied by allowances or exemptions depending on holding period, thus encouraging owners to wait. In order to limit such land retention, an annual property tax can be established.

Annual property tax

Owners lucky enough to have their property located in a sector intended for urbanization by the local plan must in return pay an annual property tax. Taxation is based on the value of their land (stated by owners themselves or set by the tax administration). In this way they are encouraged either to put their land on the market or to build on it with the prospect of making a profit. The property tax is also supposed to bring resources to the local authority in order to cope with needs for public amenities following urbanization.

Such a property tax implies that legally binding and stable urban planning documents have been set in order to earmark plots subjected to it. However its implementation stumbles in practice over the issue of partially built plots with remaining building rights. Landowners tend to consider the available surface as use value (leisure garden, food supplement, protective screen to neighbours ...) rather than market value, making taxing it politically and technically difficult.

Contributions to public facilities

Building plots are buildable not only because of the planning document but because the local authority builds public facilities and infrastructure that make them physically fit for construction, linking them to streets and utilities. Such public investments significantly increase their value. So asking landowners and developers to contribute to such public expenditure is quite fair.

We saw in the previous chapter that when such planning obligations are displayed in advance, they may help property prices stabilise since builders incorporate them as expenditure in their balance sheets before making offers to landowners. In this way landowners, taking advantage of public investments, absorb their cost, instead of taxpayers or home buyers.

Planning obligation systems are universally implemented by local authorities. They prevent debating philosophically over fairness concerns and allow focusing only on technical considerations.

Purchase of building rights to the local authority

The principle of this method is that beyond a set legal density ceiling, the right to build belongs to the community and must be bought back. However, it tends to encourage a two-tier urbanization: landowners who do not wish to pay the contribution build beneath the density ceiling; but professionals who, following an economic rationale, deem it profitable to pay the contribution build up to the maximum plot ratio. The result is therefore likely to be an irregular and under-densified urban fabric.

Density transfer

With this method, all landowners from the start are allocated the same theoretical building rights per land area unit. This idea opposes the previous one: the right to build does not belong to the local authority but to all landowners.

Density transfer is used particularly in rural or mountain communities, with patchwork plots and scattered housing, experiencing strong tourist pressure. A typical case is a mountain village that has become a winter sports resort: the local community was traditionally close knit together due to harsh climate and poor soil. Setting building zones would entail such inequalities between landowners that it is politically impossible to establish a local plan without a level playing field. This is arranged so that the “emitting” area groups together all families and gives them building rights proportionally to the surface area they own. Consequently those who want to build in the “receiving” area must first buy back building rights from other families.

However the density transfer system definitely sets building rights at a particular moment. So any subsequent, zoning or densification, becomes fraught with legal and political problems difficult to overcome.

Efficiency and fairness

Equity and efficiency may sometimes oppose each other: capital gains taxation tends to slow down the transaction flow; purchasing rights to build to the community leads to under-densification and underuse of public facilities; and transfer of density prevents any urban design evolution.

Moreover the land equity concept is difficult to handle. Which landowners should benefit from capital gains: from the whole local community, including natural and farming, or only from urban areas?
And more generally, why would capital gains be shared between landowners only, without benefiting to other categories such as social housing tenants? Indeed, real estate wealth is not the result of work or risk taking. It is a rent, an "enrichment without cause" that comes only from local authorities’ decisions: zoning in the urban planning document, public facilities, etc.

In many countries, practice and positive law have ended up doing away with this philosophical debate, only retaining technical and fiscal efficiency criteria. In those countries general law states a non-compensation principle for urban planning easements resulting from local plans and legislation: as a result, limitations to the right to build are not subjected to financial compensation.
With this non-compensation principle, as it were, the law ratifies land inequalities induced by planning documents: the landowners who are attributed little or no building rights are not

entitled to any compensation; density transfer being the exception only for very specific locations.

CHAPTER 6 : THE FOUR DEVELOPMENT MODES

In the previous chapters, we have successively reviewed the three levers which the local authority can use to control urban planning: land use, public infrastructures and services financing, urban plan and building rights. We now have to see how the local authority acts simultaneously on these three levers in order to control urban development, how it builds a strategy taking advantage of all legal instruments' complementarities and synergies, and finally how it organizes its relations with other parties.

If we consider urban planning and development as a local system of actors, the local authority is in a prominent situation as the system's regulator. It is able to define the other players' hand (companies, developers, landowners, farmers, etc.) thanks to the many public power prerogatives it enjoys. It sets local rules using regulatory and land use tools such as planning documents, pre-emption and expropriation rights, planning obligations, etc. But in doing so, it does not do away with other actors' room for manoeuvre. They also have their own legal, economic, financial or political resources. They enjoy significant freedom and are not determined solely by the will of the local authority or by what it would have included in plans and programs. These other actors are free to act in space and time. Companies may move to another region, developers may work in neighbouring towns or cities, landowners can wait for the local land use policy to change, etc. They can also challenge the local authority's actions in court, taking advantage of the law's ever growing complexity.

Therefore the local authority does not play alone on an empty chessboard without opponents. As with chess, it is in its best interest to build coherent strategies using appropriate pieces (legal tools) to meet its objectives, making them work together, organizing their mutual support, taking advantage of their capabilities. Each tool has a direct effect on its own domain (planning, land use, financing) but will also affect others indirectly. The plot ratio or the planning obligations have an influence on land prices. Pre-emption or planning obligations may in fact reduce building rights to nil, etc. As in a chess game, each piece will only operate fully when used together with others, just as the attacking rook must be supported by the knight or the bishop. The choice of the toolkit to use in a particular configuration is not neutral for the strategy to be effective. Some tools naturally oppose each other and using them simultaneously would be counterproductive. For instance displaying in advance the plot ratio in an area where the local authority intends to buy the land and develop it for social housing will make the project more expensive. Systematic pre-emption or a deterrent plot ratio in a sector to be renovated thanks to market forces may prevent spontaneous renewal by property owners.

In the urban planning system the local authority may choose strategies ranging from strict interventionism to total laisser-faire. Urban development is still a field where command economy is possible: the local authority may directly build serviced plots. Conversely, it may let market forces operate freely within very few regulations. Between these two extremes, intermediate strategies are possible: set a precise regulatory framework and let developers and landowners freely reach sale agreements within it; or negotiate directly with them the future development's content and arrangements.

According to its preferences, its objectives, the land state, and the actors involved, the local authority will therefore choose a strategy and lay out its pieces (legal tools), putting in pole position the most appropriate one to the local situation. In a chess game there are classic openings series and it is so in urban planning. There are also openings families. They are much fewer than in chess, however we can identify four of them, which are four development modes, ranging from the least to the most interventionist:

I. **Spontaneous development** (laisser-faire in a free market) - mostly individual housing and small condominiums, in already serviced areas, without detailed planning, and with no significant change to the urban fabric.
II. **Regulated mutation** - small or middle size development operations through private initiatives, guided by the market. Detailed plan and other specific rules (fees, proportion of social housing…) imposed in advance on developers. Infrastructure provided by the municipality.
III. **Negotiated development** - more important projects negotiated between the municipality and developers. Provision of infrastructure by both the developers and the municipality. Commitments formalised through a long term contract ("hybrid" organizational type[22]).
IV. **Public development** - huge and costly urban projects managed by the municipality or a public corporation (interim acquisition), which cannot be left to the market because of their complexity and specificity ("hierarchic" organizational type).

The four development modes thus distinguished are, of course, ideal types. Reality is always more complex. For example, "regulated mutation" may hide some negotiation. But these ideal types are useful for analysing the kind of relationships between parties involved. They are also convenient when it comes to developing urban strategies and planning documents taking into account power games being played out at the local level.

Talking of the chess metaphor we should note that there is, in fact, a significant difference with urban planning. In chess, there are a winner and a loser. It's a zero sum game. Conversely urban development should be a positive sum game: all players win or lose at the same time. Some win or lose more depending on their strategies but, overall, they share a common interest in the development's success. However, any choice of development mode by the local authority will have redistributive effects on land prices, on public budgets, on landowners' capital gains, on planning documents' stability, and finally on urban design and landscape.

SPONTANEOUS DEVELOPMENT IN A FREE MARKET

In this mode of organic growth, urbanization develops spontaneously along pre-existing roads. Roads which were originally designed for communications between towns and countryside or for serving agricultural parcels. Urbanization is then a kind of parasite on the regional or rural road network. Spontaneous development does not create new public streets, unlike the other three urban development modes. When streets are built, they are private lanes which are not part of the city's grid. These private lanes are often deadlocked or closed-circuit. They do not lead anywhere beyond the serviced plots.

These plots result from rural land division and may have kept a shape following traditional farming (for example, with limits following contour and water flow lines) and from inheritance sharing practices (which after several generations can lead to long and narrow plots). In the three other modes, plots result from urban land subdivision and are more regularly shaped and more adapted to construction.

Regulatory requirements remain limited (generic rules lightly contextualized) and serve mainly to preserve good relationships between neighbours. When there is a local planning document, it only goes alongside a smooth evolution of the pre-existing urban fabric without seeking to transform it. Regulatory provisions ensure buildings' mimicry while maintaining minimum distances between them. Such provisions do not result from a particular urban study that would have determined the desirable urban shape. The plot ratio is a complement to other rules which

[22] These terms refer to New Institutional Economics which we will see in more detail in chapter 8.

insures that new constructions do not exceed a certain size. It offers a maximum permitted floor space because the combined result of other prescriptions (footprint, height, distance to separating boundaries and public spaces, etc.) has not been studied and anticipated in detail.

In such spontaneous development sectors, the road network includes some utilities necessary for immediate buildings' connection (drinking water, electricity, sanitation…). These public facilities were financed by local communities' budgets, "catching-up" after the first constructions. They were therefore paid mainly by taxpayers. At the time of their implementation, the local technical services had often planned some oversizing in order to admit new constructions without having to intervene on the networks.

The applicable contributions' regime calculates taxes according to an average cost. Such taxes are not as money-efficient as contributions calculated according to the actual cost. But existing public infrastructures and facilities have often enough capacity to marginally admit new constructions. In such sectors, local authorities rely rather on annual tax revenues paid by additional residents to maintain, renew or expand public infrastructures and services.

The local authority intervenes on the land market only to buy plots for public facilities or social housing. Such purchases are most often done amicably. Otherwise when they happen by way of expropriation or pre-emption, it is at the buildable land market price. There is no willingness or legal possibility to carry out land price control.

This spontaneous development mode is open to all kinds of actors, whether individuals or legal entities. But it is mostly appropriate for small private actors who build for themselves or for a very local market they know well and operate in on a daily basis. Conversely big actors do not favour such sectors.

NEGOTIATED DEVELOPMENT

With the negotiated development mode, an actor of significant size is able to carry out the completion of a new neighbourhood. The program will be based on what the developer suggests to the local authority according to their market knowledge. It means that the local council has given up defining the future urbanization through written regulation or a plan set in advance. This would, indeed, have significant chances to miss the market expectations. And by displaying building rights, it would justify landowners' claims and so jeopardise the whole operations by making it unprofitable.

To retain bargaining power, the local authority should maintain uncertainty about future land rights. That way it will have more opportunities to impose on the developer its wishes in terms of urban design, housing types, facilities, environment ... As for them, the developer will have more credibility with landowners if they can demonstrate that they are the only one able to secure building rights from the local council. What is at stake in the negotiations will therefore be modifying the land rights. Initially, land rights should be minimum. On the outskirts, the area should be classified as a wild area in the local plan, even if it is intended for future urbanization in the regional or structure plan. In built up areas, the legal construction possibilities should be limited to the current use level (for example, industrial use with a low plot ratio) or the area should be considered as frozen, pending the definition of a comprehensive urban project.

The local authority will only grant the planning permission at the end of the negotiation process, if this has resulted in an agreement and a contract between parties. In countries where public and private law are distinct, development contracts are regulated by law in order to protect private parties against public authorities' abuse of power. The law also provides for public inquiries considering the operation's impact on the neighbourhood and the environment.

Where public law applies, the local authority and the developers may prefer a lighter method sticking to a non-legally binding informal agreement. The agreement will then materialize when the local authority unilaterally sets up rules that have actually been tailored: planning document changes to generate land rights, contributions to public investments calculated according to their real cost, social housing requirements, buildings energy performance constraints. An apparently “regulated mutation” may thus hide a negotiated process.

This kind of informal negotiation is all the more frequent as the perimeter of the local authority is small and as its elected leader, the mayor, is close to his constituents. In a small local community, regulations do not need to be as formal. The mayor's relationship with landlords and developers is more direct, one to one. We described in the previous chapter the "triangular" negotiation: local authority, landowners, and developers. The mayor is the pivot of such negotiation. In short, he tells landowners: "If you agree to sell your land at such price and to such developer approved by the local council, your plots will be granted rights to build". The speech towards developers is similar: "if you agree to build such types of housing, to contribute to such public facilities and to achieve such quality of urban design, then we will change the local plan. Furthermore, we will put some pressure on landowners so that they sell you their plots at a reasonable enough price to allow you to meet our requirements."

In negotiated urban development, constraining tools such as pre-emption or expropriation are only seen as deterrent weapons. Usually, the local authority will not have to use them. Moreover, it would be difficult to demonstrate they are in the public interest, apart from the case of acquiring plots intended for public facilities or social housing. The penalty is rather a positive one. If the landowner has complied with the community’s request, he may hope to have other plots classified in a buildable zone when the planning document changes. The developer who has indeed played into the hand of the local authority may well remain among the locally accepted partners and be offered other opportunities for development and construction by the local council.

Private developers involved in negotiated development should have a fairly solid financial base because they are supposed to take on the development’s risks. They should offer deficiency guarantees in case of bankruptcy and works interruption. Indeed, inhabitants will tend to make the mayor responsible for such failure. These developers should also be able to invest beforehand significant money in studies and time spent in negotiations.

Land units[23] are, on average, larger than in the spontaneous or regulated mutation modes. It is not uncommon for the mayor to be dealing on a long term basis with a few landowners’ families about various matters such as environment, employment, agriculture and forestry. Landowners may thus be incited to give up some land at the previous use price (e.g. farming) for public assignments in exchange for promises to have other plots classified as buildable.

This negotiated development mode is based on the local council's ability to grant rights (i.e., value) to the plots. This mode gives way to the most local power’s arbitrariness. It also raises the question of whether it is open to public debate. There is a dialectical tension between the public display principle, expected by civil society, and the effectiveness of negotiation between partners in a cosy office.

Please note that there is a particular case of negotiations when the local authority owns one or more plots, located in strategic situations, of which the developer needs to ensure total land control for his project. The local council is then able to match its plots’ sales with obligations that were not previously displayed (or that cannot legally be displayed) such as social housing quota, rehousing of tenants, contributions to public infrastructures and facilities, dwellings size, architectural and environmental quality, etc. This kind of negotiation, where the local council

[23] A land unit is a set of adjoining registered plots belonging to the same owner.

controls the land, is compatible with local plan and regulations' stability. There is no need for the local council to use its ability to create new land rights by changing the plan and regulations. It gains enough bargaining power through land ownership itself.

REGULATED MUTATION

When there are many actors, landowners and developers, negotiation with each party becomes problematic and expensive for the local council. On the other hand, gathering these dispersed actors within one structure able to speak with one voice to the local council would imply high transaction costs that few of them would be ready to bear. If the local council does not wish to simply rely on a laissez-faire policy, neither take the risk of a public development that would force it to acquire all the land, it will have to unilaterally specify the rules that will ensure any organized change in the urban fabric.

In this regulated mutation mode, the local council, as with spontaneous development, does not make any land improvement directly nor allows landowners and developers to freely agree on land prices. But, unlike with the spontaneous one, this mode applies to sectors that will change aspect and status, like for example, from farming to urbanization, or from single family homes to condominiums and office buildings. This change will generate a need for new public facilities. In order to finance these the local authority will try to collect contributions from developers, if possible corresponding to the facilities' real cost.

As a new urban landscape appears, it must be regulated more precisely than in the case of the laissez-faire mode. The plan is studied more in detail and regulations are set up after visual urban design simulations.

In the case of urban extension, detailed plan and regulations are designed in advance (a priori) and included in the planning document. Any developer must then comply with this detailed plan and his project must fit within the regulations (which are contextualized, unlike in the spontaneous mode). Contrasting with the negotiated mode, the regulatory plan is prior to the project. When the detailed plan is legally binding, the sector may be considered buildable even if infrastructures are not yet completed. However, the developer will have to demonstrate that his project complies with the detailed plan, in particular with regards to the streets and green spaces layout, if these are to be subsequently incorporated into the public domain. In practice, operations should reach a critical size in order to produce a coherent new urbanization and also to allow the local council to get enough financial contribution to start infrastructure works.

In town centre or in existing fabric, regulated mutation areas are indicated by a detailed ("morphological") urban design plan or by written templates.

An urban design plan is three-dimensional. It defines the expected buildings' volumes. The rights to build result directly from the pictured document.

Templates also refer to envelope volumes for each plot but they are defined mainly by written regulations. The plot ratio is usually banned because it would prevent using other rules on certain plots, such as plots located at street corners. The plot ratio doesn't guarantee either façades continuity.

Pictured urban plans and written templates may lead to very different building rights from one plot to another (sometimes doubling them). Corner plots benefit most from them. On the other hand, narrow and long plots have significantly lower building rights. Urban landscape harmony takes precedence over equality between landowners.

Pictured urban design plans generally apply to sizeable land units or blocks where a new urban shape will be generated from scratch. They also apply to circular plazas where regulations

could not give the specific requirements for each plot. Written templates apply rather along existing streets and boulevards to encourage a homogeneous built front, even if plots are fragmented and irregular.

In the regulated mutation mode, the local council's land policy is not to control prices on the land market. But because a new urban fabric is being developed or an existing one is being restructured and densified, the local council must acquire the land upon which streets, green spaces, and public facilities will be built. To this end, it may rely on authoritarian ways such as expropriation, pre-emption, or reserved locations in the local plan. In this mode, public land acquisitions will be at market price, meaning the price of buildable land.

In order to finance public infrastructures and facilities, the local council will generally resort to planning obligations calculated according to the real cost. Preliminary studies have allowed to estimate such real cost. Contribution calculated according to the average cost would usually not be enough to cover expenses. However, because the amount requested from developers does not result from a negotiation with them but is determined unilaterally by the local council, it may be difficult to adjust it accurately: if it is too high regarding land market prices, operations may be blocked; if it is too low, developers will be able to charge higher prices to landowners. In this case, developers' competition on the land market will encourage land prices inflation. Negotiated and public developments, by doing away with competition, do limit such inflation.

The same goes for previously established social housing requirements which, depending on the real estate cycle phases, may block operations or, on the opposite, confer an unjustified economic rent to developers or landowners, and cause an increase in property prices as a result.

The local authority keeps responsibility for public facilities and main infrastructures because developers do not control enough surfaces to build them directly. They just build streets and utilities to service plots inside their land unit. These developers are more likely to be local or regional and of small to average size, except in big cities where operations' size and cost justify investment by national developers.

This regulated mutation mode suits professionals more than individuals. Operations should be sizeable, requiring to combine several plots. Investments in streets and utilities are also not within ordinary individuals' reach because of their cost, often several time the initial land price.

However individuals may take part in urbanization if the local authority has decided to build streets and utilities in advance and charge landowners in order to recoup their cost (see Chapter 4). Individual landowners may also take part as members of an urban land consolidation association if they manage to agree with each other.

In this mode the local authority does not have control over time. It can only wait for other parties to take action. Therefore the urban project and the program should not be considered its priority. Otherwise if a private partner with whom to agree on a negotiated urban project is not found, it will have to take action itself and bear alone the risk of a public development.

PUBLIC DEVELOPMENT

Public development has already been described in Chapter 3 as a means of regulating the land market by offering plots serviced by the local authority. Let us remind ourselves that it implies for the local authority to acquire the raw land, readjust, subdivide and service it, and then sell buildable plots to developers, investors, or individuals. In order to do so, local authorities often use commercial-type companies, of which they hold all or part of the capital and thus control them from within. Such public companies are more flexible and reactive than

local administrations and are better suited to take on urban developments with a commercial side. However, in this case local governments will have to bear the financial risks of these public companies. Unlike private developers, such public development companies generally limit their role to servicing plots. They do not replace builders. For them land development is the main purpose, whereas for private developers it is a means to an end in order to get hold of a commodity as scarce as buildable land.

The local authority uses public development mainly in two types of situations:
- when it considers the urban issue to be so prominent that it cannot be left to private initiative alone;
- or when private initiative is not able to support large-scale neighbourhood regeneration operations or to meet important housing or business premises needs.

Sometimes the public development mode is chosen to prevent private parties from getting the benefit of land capital gains due to public action. Or the choice may result from the desire to keep using any outfit already created by the local authority such as public development corporation, housing association, technical service, etc.

The land-use strategy in the public development mode is similar to the one of negotiated development: not to grant acquired rights to landowners. Initial building rights (legal density) should be nil or minimal pending an agreed urban global project. Here the local authority's aim is not to get bargaining power but to be able to acquire the land at the lowest price possible. In countries where city councils have a pre-emption right they are able to control property prices and keep them to the level of former use (e.g. farming or industrial).

In practice, controlling land prices is likely to bring about retention by landowners. And when the local authority or its public development company acquire the land, they will probably have to agree on a purchase price in between its former and future use. Expropriation judges, in charge of protecting citizens against public bodies' encroachments, tend to rule towards the future use's price. Organized landowners may also defend themselves by challenging the compulsory purchase order, or even the local urban plan, in court (administrative or ordinary court as the case may be).

The local authority or its public developer who really want to pay the land at the previous use price should rather acquire it several year before the urban project is finally designed and agreed, and should act as a land bank in the meantime.

Plots will be made legally constructible by way of a local plan change or through a detailed plan only when they have been acquired by the local authority or its public developer. As in negotiated development, and contrary to regulated mutation, the project precedes the plan.

With the public development mode, infrastructure and public facilities' expenses are paid for by serviced plots sales. Cross-subsidization between various real estate products (housing, offices, retail and activity premises) makes it possible to allow non-profitable uses such as social housing which cannot afford serviced plots at market price.

TOOLS IN THE FOUR DEVELOPMENT MODES

	SPONTANEOUS DEVELOPMENT	NEGOTIATED DEVELOPMENT	REGULATED MUTATION	PUBLIC DEVELOPMENT
PRINCIPLE	No direct intervention from the local authority	Negotiation with private actors	Detailed rules to encourage urban fabric mutation but without direct intervention	Development by the city council or by a public development corporation
INITIAL BUILDING RULES	General building rules	No building rights	Building rights given by a detailed plan	No building rights
LOCAL URBAN PLAN	No local plan (existing streets)	The project precedes the plan	The plan precedes the projects	The project precedes the plan
LAND STRATEGY	No public intervention on the land market	Limited public land acquisitions in order to get bargaining power	Acquisition of infrastructures and public facilities' imprints only	Public acquisition of the whole surface area
INFRASTRUCTURE AND PUBLIC FACILITIES	Already existing	Shared between private developer and local authority	Local authority	Local authority or public company
FINANCING INFRASTRUCTURE AND FACILITIES	Local taxes and development tax (average cost)	Negotiated planning obligations (real cost)	Unilaterally fixed planning obligations (real cost)	Serviced plots resale

Each development mode has its own price formation mechanism. Spontaneous development and regulated mutation belong to the market economy, while public development is more part of command economy. Negotiated development lies in between, being public-private cooperation.

Spontaneous development

In spontaneous development, the land price is set according to the "residual value" principle. Indeed, the buildable land is only intermediate good to be included in final good production. Real estate market (housing or activity premises) is actually a final product market. In the case of a new building, the land price is set following a countdown by deducting the construction cost and the cost of connection to streets and utilities from the real estate price. As potential buyers are competing, the landowner will sell to the highest bidder, i.e. the one setting his offer at the maximum level allowed by the countdown.

In this mode, the land price is the one of future use (i.e. support of a building). The land market has no autonomy in relation to the real estate market. It is only a decal of it.

Regulated mutation

With the regulated mutation mode, especially on greenfield sites, the price is set in the same way as in the spontaneous mode, i.e. according to future use and real estate market price. Developers compete for well-located plots. But these professionals also include in their

countdown the cost of streets and utilities to service the plots as well as planning obligations charged by the local authority. They also include a gross margin representing transaction costs, overheads, financial expenses and net profit. They cannot offer landowners the same price as in the spontaneous mode, nevertheless this price is set according to the real estate market.

In already built-up areas, the economic incentive to transform the urban fabric relies on significant densification possibilities. As density and land prices evolve rather proportionally, as we saw in Chapter 2, land prices increase sharply and make it beneficial for property owners to change the use of their plots (for example, from single family homes to multi-storey buildings) in order to cash in capital gains. Regulated mutation is logically based on high land prices (unlike negotiated and public developments). However if the density increase between current and future uses is not enough, there will be no urban fabric transformation. And the smaller the plots, the higher the density increase should be, in order to cover the transaction costs induced by the need to acquire and gather together several built and occupied properties.

Public development

In public development, the local council or its developer acquire not legally buildable and not serviced land. They are in a quasi-monopoly[24] situation for land purchasing. With market control and pre-emption they can prevent land prices from reaching the future use level. Indeed the local council's upper hand comes also from its ability to grant building rights.

However, the local council or its developer will have to accept a higher land price than that the previous use's one. Pushing through with expropriation may lead to litigation against the compulsory purchase order or a judgment awarding the complainant the future use's price, because judges frequently underestimate the real cost of infrastructure. As for them, the landowners may agree amicably to a lower price because the local council or its developer pay in cash. Furthermore, this way landowners will avoid suspensive conditions and building rights uncertainty.

Property prices in this mode, except when there is no demand at all, are thus set at an intermediate level between previous and future uses. They are closer to the former if acquisitions are made well in advance of displaying the project.

Negotiated development

In negotiated development mode we must distinguish between the developer spot purchasing raw land (not legally buildable and not serviced), or only signing an agreement to buy under suspensive conditions.

In the first case, spot purchasing (in cash), the process is close to the public development's one, except that a private developer will have less power than the local authority. They cannot expropriate nor pre-empt. But being the appointed developer they benefit from a situation, if not monopolistic, at least pre-eminent towards landowners. For them what matters is to set the right price for the landowner to accept a trade-off, for example the price allowing a farmer to decisively expand their farming area even if it is further away. Or in the case of a manufacturer the price justifying relocation with modernization (or even closing down an unprofitable activity).

[24] Monopsony in economics term.

This arbitration price is in between the previous one and the future one, and it is all the closer to the previous one that urbanization perspectives are more distant[25].

The second case, acquisition under the suspensive condition of obtaining the building permit, is close to the regulated mutation's one. The land price is the result of a developer's countdown (residual value). In exchange for a higher price, the landowner accepts a delayed and conditional payment. If local plan and land rights are to be changed, the agreement to buy delay should be longer than in regulated mutation. When the agreement's deadline is missed, the landowner is then under no obligation to sell and they may make a contract with another higher bidder developer.

This second case applies to simple urban developments of limited size and duration, which can be completed before the agreement deadline. Such developments are not critical issues for local councils that tend to allow free competition on the land market.

Similar to this case are arrangements where landowners are associated from the start with the developer and get in the end an amount of money set according to the actual selling price of the final product (serviced plot or real estate) on the market.

With such an arrangement, no deed of sale is registered for the land before the last settlement based on the final product actual selling price. In the meantime no new land price reference is set. The land price remains virtual until a deed of ownership has been signed. However, if the project doesn't follow through due to any administrative or commercial setback, the landowner may be reluctant to settle for lower offers after their appetite has been wetted.

Thus economic mechanisms at work in each development mode lead to four types of urban land prices:

- Price of buildable and serviced land (spontaneous development);
- Price of non-serviced but legally constructible land (regulated mutation, purchase under suspensive conditions in negotiated development);
- Arbitration price (full payment in cash in public or negotiated development before any change to local plan and land rights);
- Previous use's price (public development on farming land reserve, or urban renewal on industrial waste without demand on the land market).

From the local authority's stand point, the rationale for intervention on the land market is not the same depending on which development mode it intends to favour. With spontaneous development and regulated mutation the local authority has to accept high land prices because it has little legal and economic means of intervention. However high land prices boost urban fabric spontaneous renewal, landowners being economically encouraged to change the use of their land in order to cash on capital gains.
On the contrary, with negotiated and public developments the local authority should keep land prices as low as possible to avoid jeopardizing future projects. To this end, it should try fencing in the different development modes geographical sectors.

FENCING IN THE DEVELOPMENT MODES AREAS

Land price references tend to cascade from development modes with higher prices (spontaneous development and regulated mutation) down to the ones which cannot afford to

[25] One way to assess such a property is to start from the future use's price (before servicing the plots) and to take away the land banking financial cost as well as a margin of error in case the land does not become buildable within the envisaged deadline.

pay too much for raw land (negotiated and public development which support higher infrastructure and public facilities' costs)[26].

The most frequent case of edge effects between modes is when a legally binding local plan or detailed plan grants building rights even though the local authority prefers to proceed by public or negotiated development. Meanwhile, price references are set based on future use (building land minus planning obligations, fees and margin). And when later on the local authority wants to take back control of its urbanization, at least to regulate its pace according to infrastructure and public services capacities, it realizes that it has already shown its hand and that regrettably its room for manoeuvre is greatly reduced.

Another possible wrong move is when the local authority did not display landowner's duty to contribute to public expenditure for infrastructure, services and social mix while granting building rights through a legally binding plan. Land prices are then set as in spontaneous development (constructible and serviced plot price) and it will be more difficult later to charge landowners and developers with fees and planning obligations.

To avoid blocking operations due to excessive land prices, it is useful to anticipate which development modes will be retained at the time of drawing the local urban plan, and to fence in each urban sector accordingly. Such compartmentalization may result not only from zoning but also from other procedures such as pre-emption right or development tax. It may also result from any informal notice given by the local authority to developers.

Indeed, compartmentalization and land market fluidity are best achieved when the local authority maintains ongoing relationships with professionals such as developers, real estate agents, notaries, land surveyors… to explain its intentions and which rules of the game it wants to be applied. The aim is to ensure that professionals avoid outbidding each other and sign agreements to buy which will prevent urban development from running smoothly. Professionals, as for them, also have an interest in such ongoing relationships that save them a lot of transaction costs.

[26] The larger the area to be developed, the more expensive infrastructure costs per unit area are because it is less possible to rely on previously existing infrastructures in the immediate vicinity.

CHAPTER 7: DEVELOPMENT MODES AND URBAN FORMS

The systemic analysis does not say what is good urbanism, for example, the "Latin city", dense, animated, mineral, favouring public transport or, conversely, the "park city", spread out, airy, green, giving priority to cars? Between "traditionalist" or "progressive"[27] models, it shows no preference. It does not give any recipe for a possible "art of building cities"[28]. However, it puts forward two criteria for urban development quality.

The first criterion is variety. Any urban development that produces variety, diversity, complexity of shapes and contents allows for the maximum of urban spaces' different uses. Such variety will hardly ever be achieved through a deterministic process in which a team of designers, even talented, will have studied and foreseen everything in detail. Such variety may only be brought through random interactions of multiple and independent actors. Furthermore some level of disorder has to be tolerated, as without it there is no liveable city. But such random interactions take time and are part of a long-term historical process. Therefore, we should be respectful of the history of places in order to keep track of previous interactions that no artificial design method could recreate ex nihilo[29].

The second criterion, order and organization is, in some respects, quite the opposite. By definition, a system is an organized, structured, "informed" set (as opposed to disorder, chaos, noise). Beside variety, the city needs organization. Otherwise, it cannot function properly and cost-effectively: networks would become saturated, insalubrity and insecurity would take over, and social relationships would become more difficult and strained. Order, even hidden, also has a part to play in aesthetics. For the visitor disordered variety may be attractive and seen as picturesque but it cannot bring up the same aesthetic emotions as a harmonious urban landscape. However, excessive order kills variety.

Quality urbanism thus results from a balance between order and disorder, between homogeneity and variety, between unity and diversity. Each development mode produces both order and variety but in different proportions. In this respect, actors' interactions have a certain influence on the urban shape.

Spontaneous development

The spontaneous development takes place in the existing physical urban framework, along the street network that originated from rural paths and connecting roads. Building plots are derived from the former agricultural use (small-holding property). The spontaneous development does not question the existing land structure. Nor does it question the current urban form. It just keeps on with it, out of some kind of mimicry. The spontaneous development's urban form

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[27] Françoise Choay, « L'urbanisme, utopies et réalités » (not translated into English).

[28] Camillo Sitte, "The Art of Building Cities: City Building According to its Artistic Fundamentals."

[29] Bernard Huet, in an interview with the newspaper "Le Monde" (dated November 23, 1993), stated: "In the design of an urban project, the notion of continuity is fundamental. I usually say that an urban project is already potentially present on site even before it appears. The designer's role is nothing but a careful reading of the existing context and an accurate interpretation of it in order to "reveal" the hidden project. This approach, used over and over through generations explains how very famous urban projects took shape: St. Mark's Square in Venice, the Palais Royal in Paris as well as the triumphal axis from the Louvre to La Défense, are projects that paradoxically have never been drawn as such ".
Is not the "hidden project" mentioned by Bernard Huet the one that indeed makes the most of previous interactions, making the most of the historic sediments of any location?

does not result from any voluntary decision. It is rather the unplanned expression of all kinds of builders, individuals or professionals.

Spontaneous development is the mode which allows for the greatest number of actors, private or public, to be involved in the production of the city. It is the mode that generates the greatest variety of urban fabric, the highest substitutability of land uses, the greatest diversity of housing and population. It often leaves gaps for the less fortunate to find a dwelling. Spontaneous development is probably the least segregating urban fabric.

But in return, it may lack order due to the "every-man-for-himself" attitude. In the past, any built environment[30] harmony was ensured by technical and climatic building constraints, natural materials (stone, wood, earth), as well as the absence of urban transport and the need to gather in a fortified perimeter. Today such spontaneous harmony has vanished. Modern manufactured materials (concrete, steel, laminated wood, etc.) provide some constructive leeway. Industrialization speeds up the construction process. The automobile shortens distances. And the traditional communities' disappearance (as well as the extended family and social control that went hand-in-hand with it) also contributed to spontaneous harmony also vanishing. Construction rules enactment has become necessary to compensate for the loss of traditional and customary regulations. But such rules only forbid or limit urban shapes in order to avoid excessive disparity and neighbourhood disturbances brought by new constructions. They are not intended to promote a new urban form.

With the spontaneous development mode the historic land structure is not erased as it is with the public and negotiated development modes. This plot structure is not always adapted to new urban uses. Space ends up being wasted if the plot structure does not allow optimal exploitation of urban planning rules. Poorly shaped plots (narrow strips or complex borders for instance) impose their logic on buildings and may induce heterogeneous and disparate constructions. This mode's land structure is therefore a source of disorder. But in doing so, it encourages diversity. Random encounters between rural plots, particular projects and rules ensuring minimum coherence induce variety which is the advantage of this development mode. Finally, the non-rational plots' subdivision (from an urban planning perspective) leaves room for the urban fabric to breathe and evolve more easily.

Rural land structure always has a raison d'être related to geography (horizontal contour lines to retain earth and serve plots, greater slope lines to ensure the flow of water) and to respect it is a guaranty not to go against the landscape's logic.

Despite being ordinary, such spontaneous urban fabric is actually sought by home buyers. Indeed, it is the expression of everyone's life project instead of the one of a single designer's intention. Thanks to construction diversity, everyone can identify with their housing, which is not always the case with other development modes that have a more industrial approach to the built environment production.

But building single family homes along roads in the countryside ("ribbon" urbanization) is part of urban sprawl. In this way it opposes sustainable development.

[30] See Bernard Rudofsky : « Architecture without Architects : A Short Introduction to Non-Pedigreed Architecture". This author presents spontaneous architectural urban ensembles of perfect harmony that no plan nor architect's drawing could create.

Negotiated development

With the negotiated development mode, the urban project depends at least as much on the developer who puts it forward as on the local council's wishes. The latter are somehow waiting for the project that their partner will offer. Urban shape as well as program and infrastructure financing are negotiated. **The project precedes the local urban plan**. Building rights are established and permits are granted only after both parties have agreed on the project and its content. The quality of the development requires straightforward negotiating process, smooth running, balance of power between partners, and equally competent professionals on both sides (avoiding asymmetric information).

Negotiated development operations are generally larger than those of the spontaneous and of the regulated mutation modes. The operation size allows the private developer to also construct the built environment. He is therefore able to generate a new neighbourhood image, unlike the spontaneous and the regulated mutation modes where the builder must fit into the pre-existing urban framework, without having the ability to create a new social and urban image. But in negotiated development, the developer naturally tends to favour a commercial image for the new neighbourhood, knowing that buyers will seek a social standard (the "distinction" in the sense of the sociologist Pierre Bourdieu) as much as physical housing. The function imparted to the urban shape is to provide the membership's signs to a particular social group. To this end the negotiated development mode often produces stereotypical architecture and urbanism without much creativity.

When the developer is also the builder of the entire program the risk of insufficient diversity is even greater. However, the private developer may sometimes prefer to share the risks and sell plots they have serviced to colleagues who will offer buyers more diverse products.

It is up to the local council to act as a counter-power and to impose a longer-term perspective to operations: neighbourhood arrangement, social diversity, environmental performances, and city links …. But it can only act this way if it has acquired a doctrine and a project of its own, as well as the intellectual means to make them prevail. It must also maintain this doctrine and these means throughout the duration of the operation, because development's trials and tribulations may result in attempts to challenge the agreed quality, density and diversity of buildings. And all the more so because the local council does not build itself the outdoor spaces that will be later incorporated in the public domain. These outdoor spaces are not directly marketed and consequently risk being poorly built by the developer in order to save money.

As long as the developer acquires all the perimeter's land, the original plot structure disappears except in rare cases where the designers have had to rely on it to define the new district's frame. A new optimized and rationalized land structure is created but, because of its rigid framework, it may not allow for easy urban fabric evolution.

In areas earmarked by local council for negotiated development, planning documents are likely to be unstable. First because the urban project has not yet been determined but also because the local council should retain some bargaining power and not display building rights in advance.

Regulated mutation

Unlike the spontaneous development mode, the regulated mutation mode aims at promoting a new urban form through densification of an existing fabric or a peripheral extension. The local council knows in advance which urban form it wants, and will impose it through plans and regulations which builders must comply with. In this mode **the plan precedes the project**,

contrary to other development modes. Regulations explicitly state what is expected from the urban form. They do not just forbid or limit it as in the spontaneous development mode.

However, this new urban shape remains quite common. In existing fabric, the goal is often to ensure a regular building front along the street or boulevard. In peripheral development, the aim is at least to prescribe a rational grid of new lanes instead of a cluster of cul-de-sacs.

The regulated mutation mode mainly produces what the market is looking for: classic multi-storey buildings and pre-designed or pre-fabricated single-family houses. The architectural touch is less common and it would probably not fit into pre-established regulations. But such market products do not exclude order and variety.

The regulated mutation mode is therefore not intended for ambitious urban and architectural projects. If the planner in charge of the preliminary study nevertheless suggests or imposes such an ambitious project, it is unlikely to come through. Planning regulations will therefore not promote innovative projects. Instead, their expected effect will be to ensure regularity and avoid blatant faults that would disturb the urban landscape. They will regulate more accurately the impact of buildings on public spaces while leaving some freedom on back alleys and private spaces.

In peripheral areas, the imposed scheme will set a hierarchical and readable street grid in order to avoid residual plots to become landlocked through successive operations and forcing users to ridiculous detours to go from one house to another. Many overall operations in urban sprawl have suffered from lack of planning and have developed in a spontaneous and sediment-like way, without global coherence. They did not sufficiently take advantage of forward thinking even if no pre-existing road network should have made it necessary. In the regulated mutation mode, light planning regulations are not sufficient because they leave responsibility to each single developer for the overall urban organization. On the opposite, it requires forward planning in the form of preliminary studies and detailed plans, all the more accurate that actors will be multiple and not always predictable.

In the regulated mutation mode, the local council gives the initiative to build to others. However, it often remains in charge of public spaces. Indeed, operations are not always large enough for the developer to take over public spaces. On these, the local council may build a green supplement to complete the buildings' ordered layout (or cover for its absence).

Within each property unit, plots are recomposed and optimized according to the profitability requirements. However, new plots may remain wedged on the original land structure whose lines of force determined by the physical features still stand. The regulation sometimes will set a minimum size to operations but it does not necessarily force a single developer to acquire the whole new urbanization perimeter.

Indeed if it is well managed, this development mode produces carefree neighbourhoods while meeting city inhabitants' main expectations. When the urban planning study fits in with market and developers' requirements, the urban planning document (especially if it is binding) will be quite stable in the long run. But in the event of misjudgement or of any unforeseen market change, it will be called into question entirely.
In this respect, we should ask ourselves whether urban design detailed plans (in 2D and 3D, showing imprints and volumes) belong to architecture or town planning. The dividing line between the two is not an obvious one. Often, architecture claims to also mean urbanism. But there is at least one criterion, partially subjective, that separates the two: the way in which the architect and his client feel about the constraints imposed on them by the 3D detailed plan. If they consider these constraints legitimate because proceeding from a broader vision of the city, this is urbanism. The project manager will accept these planning constraints because they will provide guidance for their design work and criteria for blending in well with the built

environment. They will spare them the task of doing the urban landscape insertion studies themselves. If, on the contrary, the architect and his client consider that all or part of the imposed constraints are not justified and are just planners' preferences, this is architecture. Whether or not these constraints are accepted will then depend on the balance of power between the (private) architect and the (public) planner.
An urban plan is more sustainable if it avoids architectural constraints. In order to be accepted, the planning document must justify all its constraints: willingness to erect a continuous built front, to clear views on a heritage monument, to highlight a particular landscape, to preserve existing trees, etc. Conversely, an architectural document will not be able to justify all constraints. Some will appear as the designer's bias. They will be considered only as one creative option among many others and may, therefore, be challenged at the time of the operational stage.

It is all the easier to implement an urban plan as the built environment strongly suggests solutions. For example, a Haussmann-style built front for a town centre main street seems obvious. On the other hand, a 3D detailed plan on flat land in a heterogeneous neighbourhood is less likely to win stakeholders', residents' or investors' approval.

In the regulated mutation mode, the local authority gives in land control. But too fragmented a land structure may hinder any good achievement a detailed plan is meant for. With a 3D plan we may observe that the easiest plots (especially corner plots) are built first, leaving gaps for a long time. The regulated mutation works with incremental change over a long period of time.

Public development

In the **public development** mode, the local authority is directly in control of planning and development. It is able to implement proactive schemes without other stakeholders' support and approval. It is able to promote architectural innovation through reselling with specifications the buildable and serviced plots it owns. These contractual specifications are more binding than a mere planning document. Indeed, the specifications may be freely established, as in a private law contract, whereas the planning document's content must abide by general planning laws (at least in systems inspired by Roman law; see chapter 5). When selling a buildable and serviced plot, the local authority (or their public land developer) may also impose a particular architect for the operation (but only if it keeps enough bargaining power towards the builder). Furthermore, the local authority appointing a permanent chief architect for designing and coordinating the development makes sure that the whole process is coherent, from the initial stage of servicing plots to the buildings' delivery.

As in negotiated development, **the project precedes the plan**. Building rights in the local urban plan or in the detailed plan are formalized after the project has been established. And it is formalized in a flexible way in order not to hinder necessary evolutions following market changes.

The local authority also has control over public spaces since it built them directly. In this public development mode the local council is finally able to promote a true social diversity by mixing land uses (free and social housing, offices, activities, shops, public facilities…) and achieve cross-subsidisation benefiting to the less profitable ones.

But public development, like negotiated development may suffer from lack of variety because of the small number of actors involved from the start. The space was previously cleared of its former users. The original land structure disappears when the developer regroups the cadastral parcels into a single entity which will then be rationally subdivided in order to sell serviced plots. The rationale of subdividing is mainly an economic one: it provides builders with plots allowing economies of scale in construction and management (but within the limit of the local market absorption capacity). New plots are often larger than in traditional urban fabrics.

Street facades do not have the pattern of older neighbourhoods determined by pre-industrial ages building constraints.

It is more difficult for public and negotiated development modes to escape excessive order. They are not as prone to variety due to random interaction between geographical location, multitude of stakeholders and public will, even if looking somewhat disorderly. Admittedly, thanks to talented designers hired by the local authority or the developer, the urban design plan often displays some formal qualities. But these cannot always avoid producing the feeling of being artificial, looking too smooth, lacking complexity and life. Moreover total land control of the development area is likely to produce a self-centred urbanism, poorly linked to any neighbourhoods.

Urbanism quality may also be a victim of the balance sheet rationale, which is to balance expenses against revenues. This rationale leads to favour ordinary projects and easy to sell plots over the quality of design and implementation (especially in a depressed real estate market).

The public development mode does not come therefore without risks for the city. However this mode really allows the local authority to express and achieve its ambition of monumental urban design giving the city its landmarks and structure. The other modes rather work with a progressive evolution because they require all actors' consensus. Public development may produce the best but also the worst.

It takes time to make a city

None of the four development modes is therefore the magic formula that would bring about the right balance between order and variety. In addition, the local configuration of the system of actors cannot alone account for the quality of urbanization. There are many other factors, such as local community's economic wealth and cultural atmosphere, education of leaders, traditions, ideological values and models, and so on.

In the end, the development modes' diversity itself should contribute to city-wide variety while insuring the paramount order. Indeed, a city built out of a single development mode would be an absurd city. An entirely spontaneous urbanization would have no consistency and would be hard to fathom. An exclusive use of the regulated mutation mode would generate an orderly but monotonous city. A city entirely made up of negotiated developments would risk to be nothing more than a juxtaposition of homogeneous social classes' ghettos in which any notion of urban community would be excluded. Finally, a city entirely in public development would undoubtedly be excessively monumental, monotonous and boring.

A city needs various sequences. Essentially then there should be a variety of development modes. Such diversity should not happen passively but, on the contrary, it should be planned in advance in order to give each development mode its rightful place in the overall urban project. It is all about becoming aware of the impact of the actors' interactions on the urban form and taking advantage of it. It is also about prioritizing public interventions. A city does not need to be monumental or even well-ordered in all its neighbourhoods.

Finally, current practices show that development modes may not only juxtapose but also interlock with one another. A large public development may leave whole blocks to regulated mutation or negotiated development. It may also produce bigger plots entrusted to retail developers who will service and market smaller plots for end-users or builders. Similarly, a regulated mutation development may allow some room for negotiation within a basic rules' intangible framework (such as legal density).
However a brand new urban development, even formally and functionally successful, will never reach the ancient city's soul and character. It may interest architecture amateurs but hardly

shoppers and loiterers. It may find it difficult to generate spontaneous urban life except, sometimes, when architecture is a pastiche of ancient times. On the other hand, urban renewal can be successful when taking into account the legacy of the past. Two centuries of urban explosion and many diverse experiments later, we realize that indeed a new urban development still lacks a certain dimension compared to an older neighbourhood. This dimension is the patina of time.

Only time will bring, by sedimentation and selection of the most interesting urban elements, the variety and unity that make the ancient city's charm and attraction. To rediscover these qualities of traditional cities, we must understand again the art of "building with time".

But modern planning and development actors tend to think in terms of definitive built products, not thought for future evolution. Each urban space is given a definitive assignment. The new land structure is not designed to facilitate substitution of land uses over time. Public development and negotiated development obey a rationale of operations boxed in time and space. They push forward a "finished" layout as opposed to the city's normal evolution which is of "indefinite" transformation.

David Mangin and Philippe Panerai[31] suggested to take into account such temporal dimension and prepare for it from the very planning stage by thinking urbanism directly from the plot structure and not just from the building. Indeed, the traditional development of cities has always been a continuous process, the plots, whether from rural or from subdivision origin, densifying gradually[32].

This approach amounts to dissociating over time the steps of land subdivision, infrastructure and building rights. Indeed, galloping urbanization's needs have led local authorities towards the modes which synchronize these three steps: public and negotiated developments. But thinking of city renewal in the long run, the connection in time of these three steps is no longer necessary. On the contrary, it is difficult to implement in a complex urban fabric already taken over by many users and stakeholders. Each actor has its own timing and forcing to unite the three steps would only result in higher financial, legal and political costs. Joining the three steps is really necessary for large right-of-way, where infrastructure must be built from scratch. On the other hand, in existing fabrics, infrastructure and public services already exist and their adaptation or enlargement may be financed by new fiscal revenues brought by renewal. An even investment balance sheet is not as essential.

In complex existing fabrics, the development modes that dissociate the three steps are the future: the spontaneous and regulated mutation, or their interlocking in a large grid public development. But only provided you invest enough brainpower in these modes which often lack prior thinking. A fine and qualitative management of building permits is also required.

In city extension ("greenfield") or large industrial waste ("brownfield"), public and negotiated developments remain appropriate.

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[31] Mangin (David) and Panerai (Philippe), "Urban Project", Editions Parenthèses, 1999, not translated. These two authors, using a typological analysis, have sought the most adapted plot to a long term and progressive renewal of the city over itself (for example, a rectangle with a street frontage of 30 meters and a depth of 36 meters).

[32] Greek cities drawn by Hippodamos, the first known city planner ever, on the model of the chessboard plan experienced in Miletus, the Roman castrum, the medieval new towns (bastides), the American cities, the colonial towns, were at the beginning only land subdivisions following an orthogonal pattern. Infrastructure and buildings came gradually thereafter. Manhattan has been filling in and densifying over more than one century until now after the original grid was drawn up on the ground.

Reasoning through the four development modes is not enough however to achieve a satisfying urban form. But no urban form should be thought of independently from its socio-economic substratum, i.e. the actors who implement it.

CHAPTER 8: PLANNING AND DEVELOPMENT POLICIES

URBAN DEVELOPMENT RATIONALES

What are the local authority's goals in urban planning and development? What are the factors explaining why at one point any local community can be expansionist and other, on the opposite, may want to stabilize its population (or even be ready to accept a demographic drop)? Empirical observation[33] has led us to identify five rationales that together may explain the local authority's attitude towards urban development, attitude that is often expressed in numerical targets for the population, jobs or dwellings' growth. These five rationales relate to land, demographics, employment, public infrastructures and services, and finally urban restructuring.

The land rationale

The land rationale has a geographic dimension as well as a socio-political one. The geographical dimension is the available space in the local authority's territory. If there is no longer such space for extension, urban development is constrained. However, many urban fabrics can still be densified and allow for vertical extension.

The socio-political dimension is related to the landowners' political clout. Such clout is significant, if not paramount, in rural communities recently affected by urban sprawl. Their local councils largely represent farmers and land ownership. If there is pressure for urbanization, municipalities see it not only as a means to reverse the rural exodus, but also to materialize land rent for the benefit of their constituents. By allowing spontaneous urban development along existing rural lanes, they in fact charge future taxpayers for the real costs of urbanization when, later on, new infrastructures and services will prove necessary.

When this land rationale is dominant, no demographic objective is generally set. Demographics simply result from the desire to develop the town and to materialize land rent.

This rationale in rural communities is nuanced by the type of agriculture. In livestock farming areas, where settlements are scattered and where spontaneous urbanization has developed along roads connecting hamlets and isolated farms, communities cannot get out of the land rationale, even when political power has shifted locally and is now into newly settled non-rural inhabitants' hands. There are still too many gaps along serviced lanes that are as many potentially buildable plots. The supply of streets and utilities servicing hamlets and isolated farms has de facto generated established building rights which are difficult for the local authority to overturn.

The land structure of such breeding areas is also more fragmented and more fragile in the face of illegal uses or squats. The prospect of informal urbanization on small plots sometimes encourages rural city councils to classify them as buildable plots in the local urban plan in order to keep a better control on land use.

On the other hand, grain belts induce bigger plots and a more compact urbanization.

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[33] Such observation was made mainly in France where the traditional structure of boroughs and rural villages serves as support for a low density sprawling redevelopment away from bigger towns and their suburbs (which are, in turn, following on from the town). The reading grid deduced from it is probably applicable to Europe but not to other models of urban development such as the American "sprawl" (spill over urban extension) or as gaps filling in dense rural areas in Asia.

When later on newly settled non-rural inhabitants take control of the city council, the socio-demographic rationale will prevail over the land one. But the latter never completely disappears when community's territory still includes farming areas. The farmers' political clout remains well above their demographic representation because they look after the land and control its provision. A local community with a lot of agricultural land[34] will therefore tend, all things being equal, to be more expansionary than another community confined within narrow limits.

The demographic rationale

A recent influx of people may destabilize the existing socio-political balance, as the local community has not had time to integrate newcomers, to say nothing of any rejection. The influx might also disrupt the local urban life when public infrastructures and services are getting saturated. And a newly settled young population may demand expensive new public facilities. A community that has experienced strong growth for a few years may probably need a break. In this case urban extension usually gets temporarily suspended.

However, when the inhabitants' standard of living improves, they tend to occupy more floor space; household size decreases, leading to a demographic decline and aging in population if new housing is not built. Such situation is likely to stimulate the local authority's initiatives to offer more buildable plots.

The demographic rationale is therefore cyclical. But in mature cities, it evolves into low or moderate growth, flattened over time to maintain a constant use of public facilities (in particular, schools).

The demographic rationale also has a qualitative dimension. Local authorities take into account their population's social mix. If the housing market working freely does not fit with the social basis of the group in power, this group will tend to control the land supply, favouring the housing programs that suit them.

The employment rationale

Large cities are committed to maintaining a balance between housing and employment, to show economic dynamism, and to allow their inhabitants to work at a reasonable distance from their home. Economic activities may also be a significant tax base for local authorities' fiscal revenue. And companies are generally less demanding towards public facilities than inhabitants.

Towns lacking jobs will tend to allocate their available space and financial investment capacity in priority to businesses. They will be less inclined to develop land supply for housing. Conversely, job-rich towns will be able to accommodate additional population. They will also have more resources to meet new inhabitants' demand for public facilities.

But towns located in a pleasant environment may also choose the residential economy (indirect jobs in services), either because their inhabitants live on monetary transfers (retired people for example), or because exporting jobs (direct jobs) are located in a neighbouring city accessible to commuters[35].

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[34] So-called "natural" and not productive areas (woods, moors, wetlands, etc.) are generally better protected than farming areas. These are often considered as reserves for urbanization.

[35] Time budgets that individuals are willing to allocate to their daily trips are relatively constant. This theory is called the "Zahavi constant", which varies according to continents and forms of urbanization. Any speed gain is in fact reinvested in longer distances, whereas the daily time

Public infrastructures and services rationale

Once the basic needs for infrastructure and schools have been met, the level of public amenities is a partly subjective notion that depends on which role the town wishes to take within the regional urban framework. Local councillors usually rate their city's level of equipment either insufficient, balanced, or plentiful. A plentiful level, i.e. capacity for additional inhabitants, is a favourable factor for expansion. Frequently infrastructures are designed to be oversized at the beginning to ensure potential growth, avoiding them getting cramped over time. Major infrastructures cannot be sliced. As they are built in one go, decision makers tend to think big rather than risking getting it wrong.

Conversely an insufficient level of equipment encourages the local authority to stop or slow down urban expansion. They will prefer to catch up, making the necessary investments afterwards before letting new population settle. However sometimes local councils may think in opposite direction and rely on new housing operations, and future taxpayers, to pay for the equipment they lack of.

The level of infrastructures and services is hardly an isolated factor regarding local public decisions. It is generally correlated with demographics or the town's financial wealth. An aging or declining population releases unused capacity, particularly in schools. And financial comfort often leads to a surplus of public facilities.

Some local authorities take into account a population threshold that would allow them to get a given level of public and private facilities. Once this threshold is reached, they favour stabilization or lower growth of their population. They may consider urban development through a constant level of public facilities. Constant facilities that are mostly schools. Urban development is then monitored in such a way as to keep the number of active classrooms constant.

The urban restructuring rationale

Historically as the city expands, there comes a time when urban restructuring is needed. This is the case when breakthroughs in a congested fabric with narrow lanes (as in Paris under Baron Haussmann) become necessary. It is also the case of a city made of scattered neighbourhoods that must be linked through building an urban centre from scratch. It is also generally the case when urbanization has developed radially along access roads ("glove fingers" urbanization) when a radio concentric reorganization has to be carried out, implementing pathways in ring roads to ease the convergence of traffic flows towards the centre. Such reorganization allows landlocked sectors, which had been left aside by the linear urbanization, to open up.
This urban restructuring rational may lead local authorities to increase the buildable land supply even though other rationales would push them more towards caution.

budget spent on transport by a user hardly changes (Y. Zahavi, JM Ryan, 1980a, "Transportation Research Record," No. 750, pp. 19-26).

URBAN POLICY AND THE DEVELOPMENT MODE CHOICE[36]

The local authority's development policy includes, explicitly or not, choosing a mode according to each neighbourhood or operation. Let's remind ourselves the four development modes introduced in Chapter 7: spontaneous development, regulated mutation, negotiated development, public development.

To each development mode is linked a more or less integrated organizational arrangement (governance structure) option:

- With spontaneous development and regulated mutation modes, the local authority allows private actors (landowners, operators, investors) to adjust their transactions in a free market. With the regulated mutation mode the market is constrained by specific regulations and the local government builds itself urban infrastructures and amenities but it does not control private agreements.
- With the public development mode, on the opposite, the local authority sets up a hierarchical integration[37] in order to carry out urban development directly or through a public corporation over which it has total control and responsibility.
- The negotiated development mode is an intermediate situation characterized by long-term contracts between the local authority and operators[38].

The local authority, like any other economic agent, will favour the organizational structure that minimizes its overall costs[39]. These are of two types: production costs and transaction costs.

Production costs depend on available techniques at a given time. Companies will seek economies of scale, that is, the manufactured volume corresponding to demand at a sufficient price on the market and for which the unit production cost is the lowest. This search for economies of scale may lead them to favour larger organizations (as for the car industry).

Transaction costs result from interactions between economic agents in a market, from trade and transfer of rights of ownership or use. Transaction costs are related to agents' relationships with their partners, before or after signing contracts: search for information on available products and services and for suppliers with the best offers. They are also related to displaying information on their own products (advertising); negotiating and drafting more or less complete contracts that must consider different contingencies; setting up safeguards to protect each party from non-performance of contractual obligations by the other party; cost of potential

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[36] Chapter written with the help of my colleague Marie Llorente, a researcher at the Centre Scientifique et Technique du Bâtiment (CSTB, Paris), following our joint work on New Institutional Economy applied to urban development.

[37] We speak of integration when a company (public or private) carries out internally all activities needed by production of goods or provision of services. This centralised internal organization is also called "hierarchy" in the New Institutional Economy's vocabulary, as opposed to the market. In such vertically integrated organization, coordination between agents is carried out by a hierarchical authority, and not by means of adjustments between buyers and suppliers on a market.

[38] These three organizational forms are consistent with the New Institutional Economy's forms: market, hierarchy, and hybrid.

[39] The local authority is of course in a broader institutional environment that includes an ideological dimension and moral values echoing public interest. However, since the fall of the Berlin Wall and the collapse of command economies, the market paradigm has become almost universal. We will assume here that local authorities only intervene to provide what the market does not produce spontaneously to meet users' demand.

litigation (to guard against "opportunistic" behaviour), etc. These transaction costs are often compared to the friction that, in physics, absorbs part of the available energy.

Within an organization, bureaucratic costs are the counterpart of transaction costs[40]. They are caused by the coordination between different internal departments. They often mean wasted time and inefficiencies caused by power conflicts, or lack of motivation when enforcement agents do not see the organization's purpose, or feel they do not get the fair reward for their efforts. Bureaucratic costs are also due to a lower ability to adapt to environment's variations. Unlike transaction costs, such bureaucratic costs are generated by the way internal exchanges are being managed within the organization. They usually increase with the organization's size.

An economic agent chooses the most efficient organizational structure, that is, the one that minimizes their overall expenses, by comparing the different cost categories. For example, an industrial firm may prefer vertical integration that secures raw materials or semi-finished products supplies. It will therefore incur higher bureaucratic costs (or internal organization costs) but, in return, it will reduce its transaction costs with external partners (it will not have to negotiate any contract to acquire each spare part entering into its manufacturing process, nor suffer any supplier's uncertainty). Conversely, an innovative company that needs to remain reactive in a quickly evolving market may prefer outsourcing tasks and functions in order to focus on its core business, where it is the most efficient. It will then accept any transaction costs induced by outsourcing as the counterpart to being flexible and also lowering internal organizational costs.

In urban development, economies of scale are much less sensitive than for goods manufacturing, especially if it deals with restructuring a complex fabric. With little control over production costs by increasing the development operation's size, the local authority will tend to minimize its coordination costs based on the project's characteristics and the transactions taking place.

The project's characteristics can be split into three categories[41]:

- **Specificity** of the physical and property context, specificity of the infrastructure and public services program, specificity of the construction program;
- Economic, political and legal **uncertainty**;
- **Frequency** of transactions.

The degree of vertical integration (from market to hierarchy) will depend on these characteristics. Note that the integration is examined here from the perspective of the local authority (as it is analyzed from the perspective of the firm in the private sector). This integration expands downstream. It is the least developed with the spontaneous development (laissez-faire). It is the strongest hand in public development. Regulated mutation and negotiated development are in intermediate integration situations.

[40] Transaction costs and bureaucratic costs belong to the more general category of coordination costs. Transaction costs are observed when the coordination between the agents takes place on a market and is guided by the price signal. Bureaucratic costs are specific to an organization (or firm) in which coordination is carried out by the hierarchical authority.

[41] Categories that once again corresponds to those of the New Institutional Economics: asset specificity, uncertainty, frequency.

SPECIFICITY OF THE URBAN DEVELOPMENT PROJECT

Each development site is unique and cannot be moved. It is characterized by its geography, its history and also its ownership structure. The more the land is fragmented, occupied, squatted, polluted, or already built, the more specific it is.

Urban infrastructure and services, by nature, cannot be moved and redeployed in another sector, unlike the industry's productive equipment (such as machinery). We must, however, distinguish between ordinary infrastructure such as streets and utilities that can be used for different purposes (dwellings, offices, factories…), and equipment that requires a particular type of premises suitable for a particular use and cannot be converted for another: a school or a gym thus cannot easily be transformed into a theatre.

The construction program may also be more or less specific in its architecture, its variety, its technical constraints of adaptation to the soil, its energy performance and environmental qualities. Note that here the specificity is largely a result of the requirements (the will) of the local authority. It is in a way subjective (or endogenous) and not objective.

city	Moderate	Strong
tructure:	ndowners; Unoccupied land (farming or natural land)	ented and irregular plots ; 0ccupied, squatted, contaminated land
ucture and public services:	cal infrastructures like streets and utilities	facilities difficult to convert into new uses
mme:	ry buildings, standardised houses	ctural and environmental ambitions; Seeking social and functional diversity

Generally, the higher the specificity of the project, the more integrated the governance structure.

Simple land structure, not too specific equipment

If the site is commonplace, if urban infrastructure already exists, if the land doesn't require any readjustment, and if the real estate products are standard and no social diversity is sought, then urbanization can be left to the market, to the spontaneous mode in a "laissez-faire" way.

If urban facilities to be created are not specific (streets and utilities, some green spaces, a community hall, for example), if the land is simple enough to be managed entirely, without expropriation, by a small number of developers who will build standard real estate products, the operational mode will be the negotiated development. The planning agreement between the local authority and the developers allows, among others, specifying the nature of the equipment and conditions for it to be taken over by the local authority in its public domain. It will also determine how much social housing is to be built.

Fragmented land ownership structure, seeking regular architectural form

On the other hand, if the land is too divided into multiple owners for a few developers to constitute sufficient land units and service them, the local authority will have to take over from developers and carry out the urban infrastructures and facilities itself. It will recover the cost later on by means of a unilateral device (tax, fees) based on their actual cost. It will, however, take the risk of investing in such facilities without making sure the landowners will follow in changing their land use. If additionally, the urban site is so specific that the local authority wants a particular urban and architectural form (e.g. a regular urban facade along the street), it will establish, still unilaterally, a detailed plan (possibly three-dimensional) for the

area. Finally, if it is necessary to achieve adequate social mix in the neighbourhood, the local authority will impose a normative social housing quota to builders. Because of its involvement in the building of the facilities and the enactment of ad hoc rules, it will effectively be in regulated mutation mode.

Very specific equipment and building programme

For a key urban site and a very specific project with prestigious buildings and emblematic public facilities (e.g., public spaces designed to make a place attractive or highlight a monument), the local authority will want to keep direct control of the development. It will try to acquire and service itself the plots to be sold to private builders, binding the latter with very specific contractual constraints (even including architect commission). In order to achieve this control, it will stick to the public (hierarchical) development mode.
Similarly, if the land is too specific to be managed by professional developers, the local authority will be led to investing directly, expropriating land or requiring owners to gather before servicing the plots. In the latter, it will have to redeem the parcels relinquished by the landowners opposed to the consolidation, which will bring them back to expropriation.

ECONOMIC, POLITICAL AND LEGAL UNCERTAINTY

Economic uncertainty

As regards urban planning and development, uncertainty is most often linked to operations lasting a long time. Land developers have little "commercial visibility": what will be the demand and the price level when serviced plots or built homes and offices get on the market?
In urban regeneration projects, will public upgrading investments be sufficient to generate solvent demand for housing or business premises (in other words: to bring back these areas into the market)?

Political uncertainty

Uncertainty is also political and institutional[42]. Local elections are, among others, disputed on issues of urbanism, and a new elected local council may well abandon or radically change the previous council's urban projects. This would alter planning rules applying to private actors (which means modifying their local institutional environment).

The evolution of urban projects and of the local institutional environment may also be affected by residents themselves when the local authority has decided to give them active part in planning decisions throughout the phases of design and implementation. Indeed in existing districts, projects will have a significant impact on daily life and on owners' assets value. To avoid or smooth out any political or legal disputes, the local authority may decide to involve local residents to define the projects and monitor their implementation.
In doing so any of their decisions may call into question any forecast and agreement on the basis of which private actors may have built their strategies. But conversely, it may help to defuse potential conflicts, thereby reducing uncertainty for private operators.

[42] To political uncertainty at a local level, can also be added national institutional uncertainty as laws and taxes are unstable and change frequently, thus reducing visibility for private actors and encouraging them to a wait-and-see approach.

Legal and litigation uncertainty

The ability for residents and landowners to take the local authority and operators to courts is another kind of uncertainty. Any litigation would increase transaction costs for operators (time loss as well as proceedings and legal advice expenses) and in many cases would lead them to give up the operation even if eventually they were proven right in court.

ainty	Moderate	Strong
nic	r medium term project in a foreseeable business cycle	rm project without commercial visibility; undesirable areas
l	y of elected local authority	e of local council; weak community governance
nd litigation	cal conflicts	on threat by local residents or environmental organizations

Generally, uncertainty deters private investors and leads the local authority to invest more directly, thus moving towards a more integrated form of governance.

Guaranteed economic visibility, weak political and legal uncertainties

If public basic facilities already exist and if planning rules are stable, private operators are able to quickly start small and medium size operations and launch them only when they are sure to meet a local solvent demand. Urban development may then be left to market forces in a “laissez-faire” way.

When the operation is bigger and will sell over a longer period of time, and requires a change in the local plan and prior public facilities, the project will last longer (meaning lower commercial visibility). Consequently the developer may seek security through signing a long-term contract with the local authority. Such contract will, in particular, provide compensation if the local authority unilaterally alters the institutional environment (e.g. building rules) affecting the project negatively (for example, plot ratio reducing or social housing quota and environmental requirements increasing). The governance structure will then be negotiated development.

Economic uncertainty related to market low demand

When the absorption capacity of the local real estate market is limited, and when no private developer is willing to launch a comprehensive development process nor carry out the necessary infrastructure, the local authority alone will have to project manage such facilities implementation. But it will also have to encourage private operators to build and pay their share to public equipment through the development plan and other rules. In already built districts, the incentive will come with a significant densification so that developers may recover the land acquisition and ground preparation costs (like occupants evictions, demolition, or decontamination[43]).

Finally, if the area has become "undesirable" because it is physically and socially dilapidated, and if no private actor is willing to invest in it, the local authority will have to carry out the regeneration process alone until the site is sufficiently attractive to meet solvent demand and trigger private investment decisions[44]. Such a regeneration process typically includes social

[43] Subsoil contamination, which we have previously linked to land specificity, may also be considered as technical uncertainty as long as demolitions and any work on the ground have not yet been carried out and there are only random ground testing available.

[44] The first private investment will probably be subsidized ("gap funding") to achieve a critical mass of redevelopment and a big enough diversification able to trigger a chain reaction and to tilt the area back into the market.

and educational components and leads in consultations with residents so that they may take ownership of the project. Any long-term contract with private developers is likely to be jeopardized by ongoing feed-back on achievements or new investment opportunity from outsiders so the local authority alone will carry out the regeneration process, or more often will delegate it to a public company, but remaining responsible for its financial balance.

TRANSACTIONS FREQUENCY

By transactions we mean the planning authorizations and development contracts (formal or informal) that developers and landowners enter into with local authorities. There are two cases to consider: one or many developers.

If there are developers who often work within a local authority's area, they may try to preserve their reputation in order to facilitate further transaction with the local government. Consequently they will behave fairly as partners without being opportunistic. And ongoing professional relationships (through building permits or development agreements) will allow both partners to learn how to work together. The mutual trust will reduce transaction costs for all parties.

However in case of a one-off operation, an outsider operator may leave the local council with a development of poor architectural urban quality which then will be costly to the local taxpayer and whose negative impact on the urban landscape will last forever. The local authority then will no longer be able to sue for damages because by then they will be long gone.

Similarly, if a major landowner has a monopoly position on land, there will be a situation of "bilateral dependence" between them and the local authority. Consequently it will be in both parties' interest to agree on a long-term contract or even to set up a joint venture to carry out the development.

When transactions are infrequent or unique, the local authority undoubtedly will prefer to control the urban development as an organizational system more integrated than the regulated mutation mode. They will then favour a public or negotiated development process.

INTEGRATION ON THE PRIVATE SIDE

Organizational integration can also be achieved by private actors themselves. This is a way for them to adapt downstream, to economic uncertainties and real estate cycles and, upstream, to any land market bottleneck.
The actor seeking integration may be a developer, an investor, or a construction company.
The operator may become land developer in order to secure the serviced plots supply and thus ensure a regular activity for their staff.

The investor, upstream, may add to their organization a provision for project management in order to build themselves the real estate products that will bring them substantial revenues. Downstream, they may add management skills to allow them direct contact with their assets' tenants, designing products more adequate to their requirements and therefore, easier to rent. The investor also keeps controls of time. This way they can bear the financial cost of properties through the real estate cycle, holding on to them during a downwards cycle, charging minimum rent, but selling them for capital gain in the upwards cycle.

Building and public works companies may also want to integrate vertically, by diversifying upstream in land and property development, thus ensuring greater consistency for their order books.

Private-side integration is a way of retaining internally any know-how acquired through experience, as well as research and development findings. The integrated developer will manage better, technically and economically, the land to real estate process. However this may incur additional bureaucratic costs.

"ALIGNMENT" BETWEEN TRANSACTIONS CHARACTERISTICS AND GOVERNANCE STRUCTURE

The table below summarizes the link between transactions' attributes and governance structure.

Governance structure	Development modes	Asset specificity	Uncertainty	Frequency
Market	Spontaneous development	- -	- -	+ +
Market to hybrid	Regulated mutation	-	-	+
Hybrid	Negotiated development	+	+	-
Hierarchy	Public development	+ +	+ +	- -

Observation of development projects shows that when there is no "alignment" between transactions' attributes[45] and governance structure, malfunctions and failures are more likely to occur.

A common case is when the local authority sets up a regulatory incentive scheme in a detailed plan (regulated mutation) while moving later towards negotiated or public development mode. Landowners are comforted in their opinion that their property should be valued as buildable land. Consequently, because of their excessive expectations, they tend to make the operation more difficult or even impossible to balance.

Another case is when the local authority relies on a negotiated arrangement while the operation's characteristics should require public development. This often leads to a breach of contract, or a delayed project, making it more costly to the taxpayer.

We should also mention the frequent situation when urban development requires planning and programming public facilities, but is left to spontaneous evolution ("laissez faire") randomness. This results into a messy urbanism, high land prices, and unforeseen expenses for the taxpayer.

Finally, it may happen that a public development which is not strictly justified by specific assets (complexity), or economic uncertainty, generates too regimented a planning, without the variety brought by enough diverse actors. Such development, not flexible enough to adapt, is less likely to resist the test of time, as the deterioration of many monolithic social housing estates has shown.

The issue of "alignment" is also for the local authority (the urban development regulator) a balancing act between order and variety, differentiation and coordination. Indeed, too much regulation (i.e. hierarchical intervention of the local authority) may thwart any private initiative at the expense of variety. But not enough regulation (i.e. the market left to its own devices)

[45] To use the terminology of the New Institutional Economics.

may result in formal and functional urban disorder, unjustified rent granted to landowners, and eventually extra investment costs for public budgets to pay for equipment upgrading and unplanned urbanization restructuring.

CONCLUSION: CAN WE MODELIZE THE URBAN PLANNING AND DEVELOPMENT SYSTEM?

Jean-Louis Le Moigne[46] recalls that "... any system is an artificial product of the men's spirit [...] not in order to explain them but to represent objects that man wants to know". A model is an attempt to represent a fragment of reality, but because it is only based on functional and morphological analogies with this fragment, it cannot claim to be an explanatory theory. But the model building exercise is likely to bring a better intelligibility. The model therefore does not produce scientific proof, but its validity can be assessed in simulation by comparing its results with the observed reality.

Therefore a model remains a personal construct, an invention of the modeller and, in this respect; it reflects the latter's preoccupations, preconceived ideas, material and psychological interests. Throughout this book, we have analysed urban planning as a system of mainly economic and political actors, leaving aside social or cultural actors. It is this same intellectual project that guides us in our attempt to create a model. This attempt has encountered two hurdles: to which degree of detail should we go when reproducing reality; and how to report on actors' behaviours.

A model describing a reality as complex as the one of urban planning cannot claim to be isomorphic to this reality (in an isomorphic model, each element of reality relates to one and only one element of the model). Assuming that this were conceptually possible, the construction and use cost would be expensive. And any model as complex as reality would be so heavy and overladen that it would hardly provide any overview. You wouldn't see the forest for the trees. In building a social reality explanatory model, especially if one wants to use this model for education and training, a high level of abstraction and simplification is required. At best the model would only be homomorphic: to each element of the model relates at least one element of the reality, without the opposite being true.

The second hurdle is about modelling urban development actors' behaviours. Can they be reproduced through mathematical equations? When there are many agents like city's inhabitants, we may rely on the law of large numbers in which aberrant behaviours in one way or another compensate for each other. An average behaviour is then mathematically formalized. Some agents are in limited number but their professional behaviour follows a predefined role and a rationality that can be more or less mechanically modelled: bankers, expropriation judges, tax services evaluators, induced jobs creators, etc. Other agents such as landowners also have a less defined rationality that can be described in probabilistic terms.

But modelling is trickier if one wants to represent the behaviour of the few big actors who have a decisive impact on the urban system evolution. These big actors enjoy such freedom of choice that we cannot restrict them within the law of large numbers. They have the power to coalesce, to cooperate or, on the opposite, to conflict.

Moreover, the rationality of some key players involved in the urban system, such as national and international companies, should also be assessed on a territorial scale far much larger than the local authority's geographical limits. These big players operate within regional, national or international scales. It is impossible for an observer from the local system to grasp fully their rationality. Decisions by these big players are not really predictable for the local level which is affected by them without understanding them. Big actors' strategies go beyond the local authority's cognitive capacities.

[46] « La théorie du système général », page 74 (not translated into English).

Modelling with a computer program a random phenomenon such as the key player's behaviour, even with a degree of probability, would artificially introduce determinism that does not exist in reality. How then can we solve the problem if we want to simulate the urban planning system? One solution is to have the main roles played by flesh-and-blood actors in a position to project themselves into these jobs, meaning completing the model with a role play. The simulation thus becomes a "played simulation". This is the position we've adopted for the "Urbax" model (described in the appendix), both for these conceptual reasons and because the role-play technique is effective for education and training. Educational use brings immediate economic benefit to the model.

To what extent can such a model also be used as help in decision making?

By definition, a model cannot predict the evolution of a complex reality because some of its elements are inherently unpredictable, such as the main actors' behaviour, as we have already pointed out. Those actors are able to take advantage of announced forecasts in order to foil them by creating new uncertainties.

Furthermore, to be considered operational, the model should have been validated and calibrated on a real urban situation for several years. But all urban contexts are different.

However, used in a real pre-operational context, the simulation makes it possible to explore scenarios, prospectively and non-predictively, by testing stakeholder strategies. It also makes it possible to experiment with tools for decision making on physical and financial aspects of the urban planning and development system: forecast balance sheets, sharing public facilities' cost between public and private parties, etc. It allows local stakeholders (elected officials, professionals, citizens…) to learn how to understand each other's lingo and develop a common culture, thus promoting collective action and group cohesion. Finally, it shows that the city takes shape and evolves following a multitude of personal decisions, in permanent interaction between general planning and individual initiatives.

APPENDIX: THE URBAX SIMULATION

Urbax is an urban development simulation (role game) led by one or two professional game masters with the help of a computer program. The players simulate various decisive roles: local council, developers, entrepreneurs, housing association (5 to 7 teams gathering 15 to 20 trainees in total).

It has three educational objectives:

- To understand the actor's goals and strategies: local authorities, public and private developers, production and service companies, landowners.
- To understand the urban planning and development system and its complex interactions.
- To be able to choose and implement the right planning tools and methods according to the urban context.

The simulation module is designed to balance realism, playability and portability in different national situations. It thus makes reality simpler in order to make it intelligible for trainees who are taking active roles positions. The model takes up the urban planning system structure as it is described in Chapter One. Causalities unfold as follow[47]:

Activities and Transfers -> Residents -> Housing -> Land -> Equipment -> Urban Planning

But the model has many feedback loops (also described in chapter one) that make every element of the system interact, directly or indirectly, with each other. For example, housing supply and urban amenities determine the sociological composition of the population that in turn determines the type of activity likely to settle in the city.

The educational product comprises of the simulation software and a case study based on a real case or built from scratch for educational purposes[48].

The software program simulates the urban context as well as the many actors with determined or probabilistic behaviours that can be modelized: inhabitants (voters), housing purchasers, small entrepreneurs and traders (induced activities), land and real estate owners, bankers, tax assessors, expropriation judge.

The software also performs the following tasks:
• guiding the sequential progress of the game over time by reproducing the urban development stages in time;
• recording events and keeping teams' accounts;
• providing system status information at any time, in alphanumeric data and with thematic maps;
• updating the sustainable development indicators according to the three pillars: social, economic and environmental (GHG emissions, in particular).

The role game is implemented by certified facilitators who have both a culture of urban planning and development and the ability to lead group dynamics. They are the only ones allowed to handle the software. For trainees there is no computer knowledge required.

[47] The model is derived from the economic base theory.
[48] Look at www.urbax.eu for available versions.

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