TECHNICAL GUIDEBOOK FOR FINANCING

PLANNED CITY EXTENSION AND PLANNED CITY INFILL



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HS Number: HS/072/16E

Coordinator: Marco Kamiya Principal authors: Miquel Morell and Agustí Jover

Contributors and reviewers: Liz Paterson Gauntner, Rogier Van Der Berg, Joost Mohlmann, Elizabeth Glass, Salvatore Fundaro, Tefo Mooketsane and David Kariuki

Editor: Michael McCarthy

Cover Photo: Canary Wharf Station: London Docklands ©vFlickr/Loco Steve

Design and layout: Eric Omaya

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Purpose of this guide

UN-Habitat, the United Nations agency mandated by the General Assembly to promote socially and environmentally sustainable towns and cities, has designed dual methodologies for urban planning for growing cities and governments around the world. These approaches are called planned city extension (PCE) and planned city infill (PCI), and serve as an alternative to unplanned and chaotic urban expansion.

UN-Habitat's PCE and PCI methodologies take an integrated approach to the drafting and subsequent implementation of plans for cities and are based on three complementary pillars: urban planning and design, regulatory framework, and urban finance. They recognize that for urban planning to be implemented successfully, it is necessary to analyse the prevailing regulatory framework and to accurately assess the plans' feasibility from the standpoint of both the private and public sectors.

Developing a realistic and implementable financial plan is increasingly crucial to the successful development of a PCE/ PCI, as these urban plans have long lead times involving multiple actors (e.g., public administrators, private and public land promoters, and property developers), and they require sizable investments, particularly in infrastructure, land acquisition and purchasing, and construction.

There is an extensive academic and professional knowledge base of economics, urban planning, and, in particular, public finance, real estate, financial markets, and social housing. However, there is considerably less knowledge of the financial dimensions of urban planning. This document is the result of a process of reflection on the need to establish a baseline level of knowledge of these dimensions necessary to generate successful PCEs/ PCIs.

Urban planning gives rise to projects all over the world of very different scales

and within entirely different regulatory frameworks—from small, rural municipalities to large, urban municipalities; from overall planning that encompasses an entire town to executive urban planning with a narrow scope; from consolidated, developed urban land (PCI) to urban growth sectors in extension (PCE). Thus, this document is not intended to constitute a one-size-fits-all template applicable to any PCE/PCI. On the contrary, it aims to build an argument for the analysis of the financial feasibility of urban planning. It addresses fundamental issues such as the different components of plan implementation, a clear definition of "who's who" in this development process, the impact supply and demand behaviour can have on this analysis, the financial cost and cost of capital, and the phase plan

UN-Habitat's PCE and PCI methodologies take an integrated approach to the drafting and subsequent implementation of plans for cities and are based on three complementary pillars: urban planning and design, regulatory framework, and urban finance. for development as a key variable for decision-making. Therefore, this work aims to teach how to think through the financial aspects of urban planning, and how to adapt the analysis to the enormous diversity of circumstances in which urban plans are developed and implemented. Obviously, the line of argument proposed by this guidebook could be tailored into a richer or more simplified analysis according to the magnitude and scale of the project.

When addressing the financial dimensions of a PCE/PCI, it is crucial to consider the plan's feasibility from two different perspectives: that of the private sector and that of the public sector. A private sector feasibility assessment considers the ability of a given territory (each of the urban areas containing a PCE/PCI) to successfully balance the costs and benefits incurred including the future income that may function as a return on investment-and to gauge the extent to which this investment project is attractive to a given developer. Thus, assessing financial feasibility focuses attention of potential developers on the proposed investment during the process of urban development and broadens its analysis to include all phases of the urban plan's implementation.¹

In contrast, public sector financial feasibility concerns public administration's role in the plan being assessed, particularly the impact of government's actions on public finances, both in terms of the investment undertaken and the future maintenance of infrastructure and the provision of urban amenities (e.g., street cleaning, maintenance and management of facilities, waste collection, and urban park maintenance). Thus, public sector financial feasibility refers to the degree of budgetary balance or imbalance that the costs of administering the plan may impose on public budgets once implemented. It takes into account any potential income (mainly tax revenue), as well as government's ability to assume the capital investment plan. In short, the relevant level of government-e.g., local government, supra-regional administration, state government-must assess its ability to assume the investments called for by the PCE/PCI, and must determine whether it can sustain the newly constructed city once it is fully operational.²

Often, the public sector activities entail transforming agricultural land into an urban environment with urban infrastructure (e.g., transportation, water, energy, communications, and sewage). It is also important to incorporate the costs of this infrastructure into the building phase and the revenue the final products can generate because the costs of developing land and the setting of urban land prices must be compatible with the costs of construction and the final prices paid by the market.

If an urban plan is implemented by a public entity, it is because society demands modern infrastructure as well as schools, hospitals, homes, factories, shops, etc. Thus, the plan implementation process must ensure that the prices of various real estate assets such as these are in line with the demand for these products, and are sufficient to finance the costs of infrastructure provision and real estate development.

In short, we evaluate a PCE/PCI's capacity to attain financial self-sufficiency considering its cost and the potential future income derived from the operation and/ or sale of assets acquired as part of the PCE/PCI.

It should be noted that plan implementation occurs in the context of a wide array of cultures and legal frameworks. The analysis of private and public sector feasibility explained in this document is not tailored to any specific legal framework, nor any particular distribution of costs among public and private entities, nor any specific framework regarding

¹ Urban Planning and Regional Planning Working Group of the General Council of Economists, "Necessary and Important Economic Reflection on Urban Planning and Land Use," Encuentros Multidisciplinares, issue 50. Available from http://www.encuentros-multidisciplinares.org/revista-50/indice_50_2015.htm.

² M. Morell, Nous Reptes Econòmics i Financers per a la Planificació Urbanística, IERM Papers Journal, Regió Metropolitana de Barcelona Territori - Estratègies – Planejament, no. 57, 2014, pp. 97–104. Available from http://www.iermb.uab.es/ htm/descargaBinaria.asp?idRevArt=385.

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the distribution of the benefits of urban planning.

There are countries where the right of land ownership belongs to government, meaning the benefits of urban planning belong to the public. Alternatively, there are countries where the benefits of urban planning belong to landowners. Between these two extremes exists a gradation of models employing different distribution rules, such as indirect taxation throughout the entire process of plan implementation and direct taxation on the benefits of infrastructure provision and real estate development.

Obviously, the private sector feasibility assessment of a PCE/PCI should always analyze the results from the standpoint of who assumes the investment risk. In contrast, public sector financial feasibility assessments are concerned with the effects on public budgets.

Finally, it should be noted that this document is not intended to be a comprehensive or definitive guide for the private and public sector feasibility assessment of PCEs/PCIs. Urban planning is pluralistic and multifaceted, and occurs in a multitude of different cultural and political contexts. Nevertheless, this guide aims to provide a solid methodological foundation for evaluating the financial dimensions of urban plan implementation.



01 The rapid financial feasibility assessment as the first stage of feasibility assessment

The rapid assessment is programmatic in nature, meaning it establishes priorities and logical sequences of events that enable the plan to materialise without delays or disruptions The rapid financial feasibility assessment is the first stage of feasibility assessments and represents an initial evaluation of the prospects for implementing a particular plan. It aims to eliminate financially unsound proposals by reviewing three main components of an urban plan: 1) reporting the amount of investment required by a plan; 2) indicating funding sources by identifying the public and/or private entities responsible for financing each proposed action, paying particular attention to the provision of basic infrastructure (e.g., streets, roads, green areas, public service networks, public facilities, etc.); and 3) scheduling the necessary investments according to priorities and needs (e.g., over three-year periods,

four-year periods, six-year periods, etc.). Table 1 provides an example.

The rapid assessment does not entail analyzing the feasibility of a particular urban plan, but instead focuses on assessing implementation actions related to the overall organizational structure of the territory, scheduled works, and the public or private investments required to implement the plan's provisions.

In short, the rapid assessment informs stakeholders of the costs of developing land, inventories planned investments, assigns them temporary implementation priorities, and designates those responsible for their implementation.

The rapid assessment is programmatic in nature, meaning it establishes priorities and logical sequences of events that enable the plan to materialise without delays or disruptions. In other words, it determines how the plan will be executed.³

The rapid assessment also seeks to secure agreements from government entities to carry out the investments called for by the plan. By estimating the capital expenditures expected to be undertaken by government, it serves as the first step towards a public sector feasibility assessment (which will be discussed in greater detail below).

³ J. Esteban, L'Ordenació Urbanística: Conceptes, Eines i Practiques, 2nd Edition, Diputació de Barcelona, Col·lecció Estudis-Sèrie Territori, 2007.

Table 1: Inventory and desci			a under the rap			CTACE			CTAVE				
	Notice of the	No. of a	Marcela face	Tetal seat	Dut ut to 2	STAGE	PLAN (SI)	TEAR)	STAKE	HULDER	ALLUCAI	10N [.] (%)	Other
	Nature of the investment	Needs	Needs for extension	lotal cost (USD)	Priority		Ш	ш	PD	COK	Dok	GOK	Other
Streets	Public	1,323,000 m ²	-	26.7 M	А	Х						100%	
Electricity		10 Kw/HH/day											
Power station	PPP	-	-	-	А	Х			50%			50%	
Network	Public	66 KM	-	5.2 M	А	Х						100%	
Water		9.5 m3/Ha/day											
Plant	Public	1	-	1.5 M	А	Х						100%	
Network	Public	66 KM		3.2 M	А	Х						100%	
Potable WAP	Public	Within 250 m		0	А	Х						100%	
Sewerage	Public	-	-	100.8 M	А	Х	Х					100%	
Public lighting	Public	Lamppost	-	2.6 M	А	Х	Х					100%	
Internet	Public	-	-	-	М			Х				100%	
SWF	Public	-	-	640,000	А		Х					100%	
Public function													
Market	Public	Within 1,000m	3		А		Х				100%		
Public toilet	Public	Within 1,000m	3	199,000	А		Х			100%			
Community center	Public	Within 500m	1	300,000	М		Х				100%		
Youth center	Public	Within 500m	1	300,000	А		Х				100%		
Library/ learning center	Public	Within 2,000m	3	60,000	М	Х		Х		100%			
Police and fire stations	Public	Within 2,000m	3	600,000	A	Х					100%		
Home for orphans, aged,	Public	Within 2,000m	3	182,000	А		Х					100%	
Local court	Public	Within 5,000m	1	-	В			Х		100%			
Mediation center	Public	Within 2,000m	3	189,000	М	Х					100%		
Education													
Nursery school	Public	Within 500m	6	749,000	А		Х					100%	
Primary school	Public	Within 500m	6	858,000	А		Х					100%	
Secondary school	Public	Within 2,000m	3	900,000	А		Х					100%	
Technical school	PPP	Within 10,000m		-	А		Х					100%	
University	PPP	Within 10,000m	1	-	А		Х		50%			50%	
Health													
Health post	Private	Within 500 m	3	-	А		Х					100%	
Maternal and child HC	Public	Within 2,000 m	3	-	A		Х					100%	
Hospital	Private	Within 5,000 m	1	-	А		Х					100%	
Transport													
Car park (bus stop)	PPP	Every plan area	3	2,000	А	Х			50%		50%		
Entertainment													
Sport facility	Public	Within 1,000 m	3	232,000	А		Х					100%	
Neighbourhood park	Public	Within 500 m	3	-	М	Х						100%	

Table 1. Inventory and descriptive table for the investments planned under the rapid accessment

¹ PD: Private developer / CoR: City of Rwanda / DoR: District of Rwanda / GoR: Government of Rwanda. ² A: High priority / M: Medium priority / B: Low priority

02 Implementing urban plans involves long-term investments

Implementing urban plans generally involves a series of investments made over a number of years in a given territorial context, according to planned land uses defined by the urban plan.

The plan implementation can be expressed as a series of spending flows corresponding to the costs of infrastructure provision and subsequent building as planned, and expenditure and income flows corresponding to the return on property products placed on the market. The temporary balance between negative and positive flows requires a funding assessment that determines the profitability of the urban development.

To assess the financial feasibility of an urban plan, it is important to always account for the unique circumstances of

each plan. In financial terms, the complexity stems mainly from the time horizon of the project, and from the market. This is the case with real estate development projects that require different time frames (in terms of years), including the timelines for detailed planning, infrastructure provision, real estate development and the release on to the market of final property products. These varying timeframes have implications for the market's ability to absorb the new supply volume generated (in some cases, the time horizon may even span one or more generations). These are therefore operations that, regardless of the legal obligations required by each legal framework, need their own financial formula that assesses their feasibility in order to earn the trust of public and private actors who are prepared to allocate resources.

The financial analysis is the result of combining time and money. Regulations that affect the development process need to be incorporated into the timeframe of the financial analysis.

As shown in Figure 1, the drafting of urban planning is the first stage of the land development and real estate development process, and the release on to the market of the final property products is the final stage. Considering the entire process involves taking into account the planning phase and the implementation of these plans, as well as the construction phase and the release on to the market of finished products. It is therefore crucial that the private sector feasibility assessment of a long-term urban development project cover all of these stages.⁴

Figure 1: Complete land development and real estate development process



4 Also, as concerns income, the market usually offers sources of information regarding finished property products (homes, offices, industrial buildings, etc.) for final demand. It is much rarer to have price information for intermediate products (particularly undeveloped but serviced land). The confidence afforded by any financial analysis stems largely from confidence in the available and accessible sources of information. We thus recommend referencing, whenever possible, the prices and rents of real estate products intended for the final market, since this information is more reliable and more widely available. From the perspective of investment costs, the market offers different sources of construction cost information for both basic development and the construction of buildings according to the most common categories and uses or activities. The different components of the urban upgrading activities under analysis include land acquisition by government or private entities; the period of time required for granting permits; the development of the land and installation of basic infrastructure; the subsequent construction according to the urban uses permitted in the plan, and the construction of the required community facilities; and, lastly, placing these products on the market via various channels (sale, rent, administrative concession, surface right, etc.). Various agents (e.g., public and private entities, including companies providing services) will participate throughout this process; these participants will be addressed in more detail in a later section. The most important concept to emphasize at this point is that the time required to complete this full process entails a cost, as it does in any investment project. For urban development projects with long time horizons, the time value of money will be a key factor when assessing their financial feasibility.

2.1. Principles of real estate feasibility metrics

Time and the cost of money

The preceding section briefly outlined the various steps of urban development projects, and explained that many urban development projects span one or several generations.

Based on this premise, time acquires great significance for this type of project and, as we will see, time is another cost to take into account in any investment project. To explain this concept in simple terms, we refer to two fundamental financial principles: 1) A dollar today is worth more than a dollar tomorrow, since a dollar today can be invested and start earning interest immediately, and 2) A safe dollar is worth more than a risky one, meaning that most investors will avoid risk when it is possible to do so without sacrificing profitability.⁵

The first principle can be easily illustrated with a practical example. Imagine an investment project that requires an initial capital contribution of €150,000, and in the following years the project generates positive cash flows of €100,000 and €300,000, respectively. A first estimate of the project's financial returns would place the net balance of the cash flow generated by the project at €250,000.

This static method of adding and subtracting does not take into account the cost of time, and in investments such as urban development projects, the cost of time is a key factor when evaluating private sector feasibility.

To include this cost in the project, we can ask what rate of return the investor interested in carrying out this project would require in order to accept deferred payment. We can identify this rate as the discount rate, or the opportunity cost of capital.

In the example given above, let's assume an opportunity cost of capital of 7 per cent which, when applied to the corresponding years, gives us a net present value of $\notin 205,400$ (a $\notin 44,600$ difference from the $\notin 250,000$ initially calculated; the difference represents the application of the time value of money).

The most important concept to emphasize at this point is that the time required to complete this full process entails a cost, as it does in any investment project.

⁵ R.A. Brealey and S.C. Myers, Principles of Corporate Finance, 5th edition, McGraw-Hill/Interamericana de España, SAU, 2001.

Figure 2: The time value of money as the first metric



"A dollar today is worth more than a dollar tomorrow, because the dollar today can be invested to start earning interest immediately"



This example, depicted in Figure 2, clearly illustrates the reason for factoring in a discount rate of capital when dealing with investment periods that span long periods of time. An investment project's cash flow timeline yields financial values in each unit of time (years, six-month periods, etc.). It is obvious that the value of receiving an amount of money in n years is not worth the same as receiving the same amount today. Therefore, money is not a free resource, but rather has a cost that varies based on the purpose of the investment and on its timeframe. We can incorporate this cost of capital into a concrete funding proposal associated with the investment project by applying a discount rate (or opportunity cost of capital) available on the market to the investment projects' balances as a reference indicator.

The second financial principle mentioned above leads us to the conclusion that the discount rate (or opportunity cost of capital) we apply to each project under analysis will be larger or smaller based on the intrinsic risk of the project itself. Not all investments entail the same level of risk. Building housing is, in principle, riskier than a public debt instrument from the government (i.e., short- or long-term government bonds), and incorporating rural land into urban areas will probably be riskier than building within preestablished urban areas.

Thus, as a function of the risk involved with each investment project, it is necessary to add the corresponding risk premium to the correct opportunity cost of capital for the project. This means we can correctly break down the discount rate of an investment project's cash flows into a risk-free rate and a risk premium (see Figure 3). Figure 3: Risk as the second metric

*A safe dollar is worth more than a risky dollar"

Discount rate = $\frac{1}{(1 + (\tilde{r}))}$ Discount rate = RFR_[Risk free rate] + RP_[Risk premium]

In the following sections we describe the main indicators generally accepted for making decisions regarding the private sector feasibility of urban development projects: net present value (NPV), internal rate of return (IRR), and discounted payback.

Net present value (NPV)

This is the indicator par excellence, and its purpose is to update, at any given moment, all cash flows generated by the investment project under analysis:

$$VA.N = CF_0 + \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \dots + \frac{CF_n}{(1+i)^n}$$

CF = Estimated cash flow for each time unit (year, six-month period, etc.)

- i = Discount factor applied to each time unit
- n = Number of time units estimated for the investment project (years, six-month periods, etc.)

A project with a positive NPV means that:

- 1. It has returned all capital invested.
- 2. It has paid back the cost of all resources used to fund it.
- It has generated an additional surplus equivalent to the volume indicated by the NPV in question.

NPV is the best indicator for the private sector feasibility of any urban development project since it is the only indicator, along with the IRR, that takes into account the time value of money and that is based solely on the inflow and outflow of financial resources provided for in the project, and on their opportunity cost.

The internal rate of return (IRR)

IRR is defined as the interest rate at which the NPV would be zero.

$$0 = CF_0 + \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \dots + \frac{CF_n}{(1+i)^n}$$

- CF = Estimated cash flow for each time unit (year, six-month period, etc.)
- i = Discount factor applied to each time unit
- n = Number of time units estimated for the investment project (years, six-month periods, etc.)

Thus, the IRR tells us the maximum discount rate that the investment project can incur to achieve an NPV equal to zero. Above this rate, the NPV will be negative. This implies that the higher the IRR, the higher the chances of the project having a positive net present value with regard to the discount rate used. The IRR provides the criteria for us to choose the investment projects that offer return rates higher than the opportunity cost of capital.

There is much debate about which indicators are more efficient and effective when assessing time investment projects. Many agents, both public and private, prefer the criteria of the IRR to the NPV. Although both criteria, when properly applied, are formally equivalent, the IRR has some weaknesses that we must consider when using it as a benchmark:

1. If an investment project offers positive cash flows followed by negative cash flows, the NPV increases as the annual discount rate increases. Therefore, we should accept this project if the resulting IRR is less than the opportunity cost of capital.

Investment project A			Net pres	ent value f	or Inves	stment	Project /	A by c	liscour	it rate				
	Year 0 Year 1		Ø	300 -										
	1,000	-1,500	nt Value	150 -										
DR		10%	: Prese	0 -150 0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
NPV		-€ 363.64	Net	-300 -	/								Discount	type
IRR		50%		-600										

2. If there's more than one reversal in the cash flows of the project being evaluated, the project can produce several IRR, most of which may not have an economic meaning, and also may not even have a real solution.

Investment Projec	t B	Net present value for Investment Project B by discount rate
Year 0	-1,600	
Year 1	10,000	2,000]
Year 2	-10,000	90 J.000 -
DR	10%	₩ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
NPV	-773.55	Discount type
IRR	25% / 50%	-2,000 ~

3. The criteria of IRR may give the wrong classification in mutually exclusive projects that differ in economic life or in the scale of requested investments.

Project	C	D	Net present value of Projects C and D according to discount rate
Year 0	-9,000	-9,000	
Year 1	6,000	3,000	≅ 10,000]C
Year 2	5,000	3,000	
Year 3	4,000	3,000	1 1 1 1 1 1 1 1 1 1
Year 4	0	3,000	
Year 5	0	3,000	2,000
Year 6	0	3,000	2,000
DR	10%	10%	0 0% 5% 10% 15% 20% 25% 36% 35% 40% 4 5% 50%
NPV	3,592	4,066	-2,000 -
IRR	33%	24%	-4,000 - Discount type
			-6,000 」

4. It is possible to make an improper assumption about the return rate at which the project's intermediate cash flows may be reinvested. Indeed, the IRR calculates a theoretical maximum profitability since it assumes one can reinvest intermediate positive cash flows in alternative projects with the same rate of return as the current project. This behaviour of the IRR may be unrealistic in projects with high IRR. To resolve this problem many analysts use the MIRR (modified internal rate of return). That can distinguish between the interest rate paid for the intermediate negative cash flows and the interest rate received for the reinvested positive intermediate cash flows.

While all four weaknesses can lead to erroneous selection of projects using the IRR, it is important to point out that this is a highly respected and widely used financial evaluation criteria. Nevertheless, these drawbacks are worth mentioning precisely because IRR is such an important financial indicator. Future technicians who undertake studies on private sector feasibility should take into account all these peculiarities.

Discounted payback

Payback refers to a project's financial recovery period. It is determined by counting the number of periods (years, semesters, monthly payments, etc.) that must pass before the accumulation of the expected cash flows equals zero and starts to be positive in subsequent periods.

 $\sum CashFlows > 0$

However, it is crucial to also consider the cost of time. Discounted payback is thus a more accurate indicator because it considers the cash flows adjusted to the relevant discount rate. Moreover, this indicator has two important advantages over the other indicators: 1) it provides an intuitive idea of the risk, and

2) it is easy to calculate.

Discounted payback does not take into consideration any of the cash flows generated after the selected date, however; it should thus be used in conjunction with other indicators to evaluate an investment project.

2.2. Methodological considerations of fragmented analysis

Previous sections have referred to the implementation of urban planning that covers both infrastructure provision and construction of buildings. Land development and real estate development are two linked investment projects. Both of these phases can be addressed by a private sector feasibility assessment. However, it is at times beneficial to distinguish the results of development of rural land into urban plots from the results of development of these urban plots into real estate products. In any case, the costs in each of the two phases must be consistent with the final price that can be commanded for each of these assets.

This differentiation (depicted in Figure 4) shows us both the value of serviced land after infrastructure provision and the value of the built real estate products. Both values are crucial to the feasibility of an investment.

Figure 4: Fragmented analysis of plan implementation



In addition, each plan implementation has enough peculiarities to require differentiated profiles of developers. The private party that transforms the land must have a liability structure adequate for very longterm investments, while those purchasing already-developed plots face shorter-term investments (i.e., building on a plot), and therefore incur less risk. Therefore, fragmentation of the plan implementation allows individualized discount rates, which are among the key factors in a private sector feasibility assessment.

It would also be entirely permissible to apply different risk premiums in each urban development stage. In any event, the methodology to be applied throughout implementation must be the same. It is also important to adjust the financial parameters of land development and building activity to the specific circumstances of the financial market, and to the circumstances of the market for final products (e.g., housing, industrial buildings, offices, and commercial buildings).

2.3. Financial analysis methodology of real estate development

The real estate pro forma first reflects the proceeds of the sale of all real estate products for final demand (e.g., housing, offices, hotels, industrial buildings, and commercial buildings). It also includes the costs of construction and promotion of these products. However, it excludes one cost: developed land.

The NPV quantifies the volume of surplus resources of an investment project, considering some inflows, some expenditure flows, and the discount rate of these flows. If the matrix categories of income and expenses are accounted for in full (including the acquisition cost of the serviced land), the NPV equals the profit from the transaction. But if the matrix does not include, for example, the cost of acquiring this urbanized land, then the NPV expresses the maximum value that could be paid for the serviced land. If 100 per cent of the NPV is assigned to cover the costs of the urbanized land, the freedup additional resources of the investment project would be zero. In other words, if the NPV is fully assigned to remunerate the acquisition of serviced land, the investment project of the real estate sector will be compatible with the assigned discount rate (i.e., the project will cover the opportunity cost and risk premium), but the project's added benefit will be null.

2.4. Financial analysis methodology of the land development process

The matrix of income and expenses for the provision of infrastructure has as the income flow the portion of the NPV estimated as the residual value of urban land. (If the purchase of developed land has been recorded in the private sector's pro forma, this amount will constitute the potential revenue of the land development process.) This process contains as expenditure flows the total expenditure needed to transform the gross land into developed land (e.g., the costs of planning, managing, and implementation). In the same manner as in the building phase, it is necessary to consider in the pro forma whether the purchase of gross land has been accounted for. If not, this cost will be the unknown factor of the equation.

In this latter scenario, it is important to determine what gross land cost the project could support at the time the urban plan is drafted. This cost must be compatible with the discount rate applied to the anticipated inflows and expenses in the planning and implementation phases. The feasibility assessment allows the freed discounted project resources to be determined at the beginning of the development activity using the NPV.

If allocating the total NPV to cover the costs of the unknown factor of the equation (for example, the cost of the gross land area), any downward deviation from the urban plan (for example, unexpected increases in costs or interest rates) will result in a negative NPV. Likewise, any upward deviation (for example, reduced real costs of basic facilities, or reduced time spent planning) will result in a positive NPV.

03 Delimitation of areas and determining planned land uses

The private sector feasibility assessment pertains to a precise geographical area within which urban development will occur. Determining this territorial scope is not only necessary to physically delimit the investment that occurs within it, but also to delimit the foreign investment corresponding to the network connections to their immediate environment and the foreign investment generated by the possible jump of scale that comes with PCE.

The first step is to estimate the minimum urban planned land uses necessary for a feasibility assessment. Urban legislation varies enormously around the world and is characterized by myriad particularities and legal imperatives. In fact, many developing countries lack a coherent legal framework pertaining to urban areas. Thus, in many projects under evaluation, it is extraordinarily difficult to determine these land uses.

Table 2 summarizes the minimum planned land uses necessary for a feasibility assessment.

Table 2: Minimum planned land uses necessary to carry out a private sector feasibility assessment									
Total surface area of the sector under evaluation	Land (Ha. / M ²)	-	-						
Total surface of infrastructure	Land (Ha. / M2)								
(Roads, streets, pedestrian walkways, etc.)	Latiu (Fia. / IVI-)	-	-						
Total surface of green areas	Land (Ha. / M2)								
(Urban parks, protected open spaces, etc.)	Laliu (Ha. / WF)	-	-						
Total surface area of public facilities	Land (Ha. / M2)	Total units (NI)	Built area (M2)						
(Hospitals, schools, administrative buildings, etc.)	Laliu (Ha. / WF)	TOLAT UTILIS (IV)	built alea (IVI-)						
Total surface area for private urban uses	Land (Ha. / M ²)	Buildable ratio	Built area (M ²)						
Total surface area to use for private housing (low density, medium density, and high density)	Land (M ²)	Buildable ratio	Built area (M ²)						
Total surface area for social housing (low density, medium density, and high density)	Land (M ²)	Buildable ratio	Built area (M²)						
Total surface area for industrial use	Land (M ²)	Buildable ratio	Built area (M ²)						
Total surface area for office use	Land (M ²)	Buildable ratio	Built area (M ²)						
Total surface area for commercial use	Land (M ²)	Buildable ratio	Built area (M ²)						
	Land (M ²)	Buildable ratio	Built area (M ²)						
Density	No. houses / Ha	Total housing	-						
Low density residential	No. houses / Ha	Total housing	-						
Medium density residential	No. houses / Ha	Total housing	-						
High density residential	No. houses / Ha	Total housing	-						
Total housing by type	Total housing	-	-						
Private housing	Total housing	-	-						
Low density residential	Total housing	-	-						
Medium density residential	Total housing	-	-						
High density residential	Total housing	-	-						
Social housing	Total housing	-	-						
Low density residential	Total housing	-	-						
Medium density residential	Total housing	-	-						
High density residential	Total housing	-	-						

04 Breakdown of plan implementation costs: Concepts and sources of information

This chapter breaks down the costs resulting from implementing an urban plan. These costs will gradually surface according to a specific timetable and eventually together will determine the cost flow of the urban development under evaluation.

A complication typically encountered when analyzing an urban development plan is that these plans often lack the technical documentation necessary to fully evaluate certain costs, such as the total costs of required infrastructure investments (e.g., sewers, sewage treatment, and power generation) and possible costs incurred due to pre-existing factors not anticipated by the plan.

Given this limitation, to determine whether the urban development plan is feasible, it is necessary to estimate the magnitude of costs involved in the plan.

Toward this end, the following sections discuss the cost concepts that must be considered when conducting a private sector feasibility assessment. It is important to note that this discussion cannot possibly encompass every scenario encountered when evaluating a planned extension or infill, given the diversity of societies, cultures, and governance regimes within which urban development is carried out. Nevertheless, the following sections aim to facilitate discussion of the concepts that must be considered, and at which point in the plan implementation process they should be evaluated.

4.1. The purchase of land

The essential gross material—in other words, the first component of the land development activities—is the land itself. The acquisition cost of the land (when this asset operates in market conditions) is not always known, due to the lack of transparency that usually governs the market and the oligopolistic nature of this particular market.

Consequently, many feasibility assessments opt not to include this cost as one more unknown variable. When the acquisition value of land is already an unknown factor and is not introduced as a cost flow in an analysis, the volume of inflows that can be expected from plan implementation must be sufficient to pay for the purchase of land and allow for a balance between the implementation's negative and positive flows. When the feasibility assessment is negative, it will mean not only that the project is unviable, but also that it was not possible to allocate any funds for the purchase of land.

Addressing analysis of land value involves, implicitly, acknowledging the increase in value of land once it has been developed. If land gains value due to urban planning, this gain may be attributed to the entity with competence in urban planning: the government. Consequently, this gain may be returned to the citizens whose government carried out the planning. In the event that this gain accrues to a private landowner, the community can capture the value added by the plan implementation through taxation or other processes available for this purpose (for example, a land value tax, or tax increment financing).

This option is common when the initiative for plan implementation lies in the private sector. The price of land is defined by a market that is not perfectly competitive. As such, there is no cost of land representative of all the landowners included in the planned area. Each owner can hold property for different reasons and at different points in time, resulting in widely varying land costs, even within the same sector or area. Even the same owner may have very different costs depending on the point in time and the reason for taking ownership of different plots within the same sector under evaluation.

Moreover, when assessing the feasibility of an investment based on a specific cost of land when it is a private initiative, the cost to be applied to the gross land must be in line with the profitability that a given development project can generate (subject to the applicable urban legal framework). Therefore, the value of the land is often a function of the prevailing legal framework. Consequently, in those investment projects that choose not to include this cost component, and in which this variable is the dependent variable of the flow analysis, it will be precisely the value of the resulting land that allows for a determination of whether or not a project is viable. It will also help arrive at a determination of whether the project can at least be attractive from the private sector's point of view, or whether the initiative should instead be made public because it would be in the public's interest to do so (but not because of the financial benefit it generates, which is insufficient to cover the only cost component not introduced in the analysis: the land).

This method of assessing the feasibility of an urban development can change according to the manner in which the initiative is public. When the urban intervention is a public initiative through the land expropriation system, the government may have representative data on land acquisition prices in expropriation processes. Depending on the availability of these data, the cost of the acquisition of land may be incorporated as one more cost in the feasibility analysis. Table 3 provides an example of land expropriation costs in Rwanda.

Figure 5: The acquisition cost of land as an unknown factor of the feasibility assessment



Table 3	Table 3: References of land price in Rwanda for expropriation (in RWF)										
	District	Plan area	Cell	Land price per m ²	Land price Tourist attraction per m ²						
1	Karongi	Bwishyura	Burunga	337	345						
1	Karongi	Bwishyura	Kibuye	582	596						
1	Karongi	Bwishyura	Nyarusazi	153	157						
2	Nogororero	Bwira	Bungwe	92	94						
2	Nogororero	Gatumba	Gatsibo	92	94						
2	Ngororero	Gatumba	Rusumo	138	141						
3	Nyabihu	Jomba	Nyamitanzi	168	173						
3	Nyabihu	Kabatwa	Gihorwe	245	251						
3	Nyabihu	Mukamira	Rugeshi	260	267						

Source: Official Gazette n°19 of 10/05/2010: Ministerial Order N°002/16.01 of 26/04/2010 determining the reference land price outside the Kigali City

4.2. The costs of infrastructure provision

In an ideal scenario, the feasibility assessment would incorporate the full cost of the infrastructure called for by the urban plan. Often, in the process of drafting the urban plan, the available documentation does not include detailed costs of infrastructure. This is why in this preliminary phase it is usually only possible to incorporate a first estimate of these costs.

Usually it is customary to structure infrastructure costs according to the planned land uses of the area (e.g., roads, parks), with an initial estimate derived from the proposed plan, from a measurement of existing infrastructure, and from a unit price work unit for each network or service. See Table 4 for an example.



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Table 4: Concepts to consider when estimating infrastructure costs

Item	Unit of measurement	Unit price work unit ¹	Plan area needs	Total cost	Data source
Demolition and ground excavation	M ³	USD / M ³	M ³	USD	Utility
Roads and pedestrian paths	M² / MI	USD /M² - MI	M² / MI	USD	companie
Sewage system treatment	M² / MI	USD /M² - MI	M² / MI	USD	
Sewage system collection	M² / MI	USD /M² - MI	M² / MI	USD	
Water supply system	N	USD	N	USD	
Interior water network	M² / MI	USD /M² - MI	M² / MI	USD	
Electricity (high, medium, and low voltage)	N	USD	N	USD	
Street lighting	M² / MI	USD /M² - MI	M² / MI	USD	
Telecommunications (Internet, telephone, etc.)	N	USD	N	USD	
Parks and public spaces	N	USD	N	USD	
Land decontamination	M ²	USD / M ²	M ²	USD	
Drainage and flood risk management	M ²	USD / M ²	M ²	USD	
				USD	
Contingency				% total	

1 The unit prices list often varies between countries. For example, in Spain unit prices of urban work tend to be formulated in terms of MEB (material execution budget), which is the concept of price performance of work units. Six per cent of industrial profit and 13 per cent of overhead is added to this MEB, from which the contract operation budget is obtained. Each country will have its particular methodology for calculating unit prices. It is important to incorporate the final total unit price in the analysis of financial feasibility with all the included concepts.

Clearly each plan area will require a different intervention. The list in Table 4 is only intended to illustrate the most common components; there may be other factors with a high or low financial impact (such as soil decontamination, corrective measures for flood risk, etc.). The existing territory is often not free of infrastructure and services, and the damages that may be caused by the new approved planning should also be

estimated as part of the infrastructure provision costs.

When it is not possible to estimate the cost for a particular aspect of a land development project, it is recommended to incorporate within the estimated infrastructure provision costs a contingency cost that in each case will be assessed according to the characteristics of the planned land and the difficulties and un-

known technical factors that may occur during the physical development.

The budget for the servicing of land is obtained from the measurements of the work elements required for the physical development of the land, and the unit price list for these inputs.

Apart from the provision of infrastructure there may be other cost items that are not strictly physical work, but can constitute development costs for the planned land. Table 5 presents an illustrative list of some items that, depending upon the relevant legal framework, could constitute a land development cost.

Table 5: Concepts to consider when estimating planned land development costs

Item	Total cost	Data sources
Infrastructure provision	USD	Companies specializing in pre-valuation
Expropriation of land	USD	Benchmarking comparable experiences
Management and implementation costs of land development	% of total	

The planned land usually accommodates activities (either purely agricultural or specific to urban areas) that are incompatible with the proposed plan and should be replaced by elements of the new plan. The owners of preexisting assets should be compensated according to the prevailing legal framework (however, this is not incompatible with the fact that, as owners of the land, they can participate in the urban rights that define the PCE). This compensation should be a component of the costs of urban development.

Over time, compensation costs increase (especially in areas of renovation and urban rehabilitation). A pre-assessment of possible compensation that must be allocated to the area according to the current legal framework would allow for a more thorough feasibility assessment.

4.3. Building costs

Building costs are one of the main cost components to be taken into account throughout the plan implementation process. Based on the urban uses and planned land uses envisaged in the planning, building costs should be allocated for each of them in terms of built floor area (in the relevant currency in each case).

There are numerous possible building uses—for example, residential, commercial, industrial, and office—and each of these uses can be divided into different types (e.g., low-, medium-, and high-density housing; single houses, semi-detached houses, terraced houses, or apartment blocks; social housing or free-market housing; or industrial estates either with adjacent warehouses in rows on small plots, or large industrial plots of $10,000 \text{ m}^2$, $25,000 \text{ m}^2$, etc.).

The level of detail depends on each urban tradition, the law in every country, and a country's ability to "fill in the blanks" in an urban plan. As such, a more definitive urban plan is not necessarily better than a less definitive one.

Because every country (and even different regions within the same country) has its own real estate production process, it is essential to garner market knowledge and experience before preparing a feasibility study. It is advisable to take into account the following building costs:

 Hard construction costs: These are the costs of the tangible materials needed for construction. They are directly quantifiable by calculating the number of products by their unit price. As shown in Table 6, they can be broken down into construction costs (work and materials necessary for completing the building) and finishing costs (electrical and mechanical equipment, etc.).

- General expenses and the developer's profit: From the budget for the materials and execution obtained above, it is possible to calculate the final construction budget by applying a percentage for general construction costs that will be incurred by the contract, plus a percentage for the profit of the contractor. These percentages are different in every country, and their application will depend on the case in question.
- Promotional and management costs: Also known as soft costs, these include a variety of costs necessary to complete the construction project. They include the fees of professionals involved in the project, management expenses, taxes and duties, insurance, and administrative costs.

Table 6: Components to consider when calculating construction costs									
Component	Total cost	Data sources							
Hard construction cost	USD/m ² built area	Public administration publications (Ministries)							
Structure	USD/m ² built area								
Finishes	USD/m² built area	Specialist trade journals							
General expenses and developer's profit	% of total								
Promotional and management costs	Itemized components as % of the total	Real estate developers							

4.4. The cost of capital

Section 2.1 introduced mathematical calculations that account for the cost of time in investment projects. As mentioned earlier, accurately determining the financial cost of projects with long-term investments is extremely important for guaranteeing the private sector feasibility of any urban development project.

The discount rate that should be used to discount flows (and thus incorporate the cost of time) will be the weighted average cost of capital (also known as WACC). The WACC is estimated according to the borrowing costs, the opportunity cost of the equity, and the proportions (in terms of market value) of both types of resources:

$$WACC = K_e x \left(\frac{E}{E+D}\right) + (1-t) x \left(\frac{D}{E+D}\right)$$

where:

Ke	=	Oppor	tunity cost of equity							
Kd	=	Overa	Overall cost of the debt							
t	=	Tax ra	Tax rate							
E/(E-	+D)	=	Market value equity ratio ⁶							
D/(E·	+D)	=	Market value debt ratio							

When an investment project falls within a company (whether public or private), the company will adopt a financing plan based on internal and external resources. Equity will have a cost in terms of the commitments taken on with shareholders, employers, consortium members, and the like (depending on the type of actor in each case), and borrowing will have a financial cost and repayment terms that the company has agreed upon with the relevant financial institutions.

Figure 6: Conceptual diagram of the cost of capital of an investment project



The cost of capital is the expected return on a portfolio of all the company's existing securities



This method of dealing with the cost of capital in an investment project is difficult to apply in a private sector feasibility assessment. This is because an assessment is not undertaken from the perspective of a particular company. Rather, it is undertaken from the perspective of the area of the PCE as a whole. This necessitates finding the minimum cost of capital that might be reasonably applicable to the urban development.

⁶ Where E is equity and D is debt.

It is therefore necessary to find an alternative way to evaluate the cost of capital applicable to the area under analysis. This alternative is known as the opportunity cost of capital and is the same as the expected rate of return the investors might receive from alternative investments—for example, a risk-free investment in government debt (bonds and notes).

Bear in mind that when applying an indicator such as the interest rate of the debt issued by the United States, this rate could be regarded as free from risk. Therefore, it must be adjusted by a risk premium equivalent to the risk of the project whose financial feasibility is being assessed (see section 2.1).



Graph 1: Local currency debt (government average issue yield of treasury bonds)

05 Market prices and revenue flows

The implementation of urban plans encompasses both the land development, and the construction process and release on to the market of finished products. It is worth reiterating this point, as often urban development, planning, and management are only associated with the process of developing the land. As a result, many feasibility analyses are limited to demonstrating the feasibility of the investment in land, ignoring both whether there is demand and the prices that could be commanded.

Investment in urban development works results in the developed land and plots suitable for building purposes. Meanwhile, the construction process itself gives rise to real estate products aimed at the final demand sector. In all cases, both the plots for building on and the finished properties (houses, commercial premises, offices, industrial warehouses, etc.) are intended to command particular prices.

These prices allow for an estimation of the expected income from an investment project. Some methodological observations:

 The process of urban development generates intermediate products (i.e., serviced land) with certain market prices. However, each of these intermediate prices must be compatible with the market price for the end product, which is what determines the feasibility of infrastructure provision and real estate development.

- The need for prudence when formulating the private sector feasibility assessment requires using the feasibility of the full plan implementation as a benchmark. Therefore, this feasibility cannot be justified only by certain market prices for developed land. Rather, it needs to be justified in terms of both infrastructure provision and the construction process. It is thus necessary to demonstrate compatibility between the market prices of the intermediate products and the market prices of the end products.
- The market offers various sources for the prices of finished real estate products (housing, business premises, industrial warehouses, etc.). These include the price statistics published by certain national and international public bodies (public administrations, ministries of housing, ministries of infrastructure and public works, regional governments, supra-municipal authorities, and some municipal and metropolitan authori-

ties), secondary information published online, advertisements in the press, and sector-specific surveys carried out by national and international agencies. However, generally speaking, there are far fewer sources of information on the price of land, which makes it very difficult to illustrate the market prices of intermediate products such as developed land and plots, or even of gross land pending urban development. The diversity of sources of information on finished products and their level of territorial disaggregation allows estimates to be made by products and regions, which is not the case when seeking information on land prices.

General construction products (housing, business premises, offices, industrial warehouses, etc.) have a supply and demand market. As previously noted, it is possible to use secondary sources for prices or, if these are not available, to conduct specific fieldwork and talk to developers in the region in question to obtain information on this variable. However, when a plan includes unique products—such as hotels (with all their different formats, categories, and

markets), shopping centres (as opposed to shops on the ground floor of blocks destined for other uses), indivisible plots or ones with exceptional dimensions, service stations, etc.—it is then necessary to adapt the methodology and the search for prices to each specific case.

 Sometimes a generic definition of a particular built area allows a wide range of possible final uses. Normally, when the urban plan leaves these options wide open, it is because there are insufficient justifications for earmarking it for a specific use, and it is left to time to decide upon the best use.7 In these cases, a series of principles should be applied that will help to clarify which uses should be borne in mind among all the possible future options. The first is the principle of greater and better use, which seeks the most economically advantageous option among all those available. There is also the principle of probability, which would make it advisable to opt for the most likely outcome.

Finally, there is also the principle of prudence, which counsels evaluating the investment and the income relating to the use that has the biggest market—or, to put it another way, one that is less exclusive, more transparent in terms of the information available and, therefore, more reliable.



Source: Knight Frank Research, African Report 2015

⁷ With regard to the predictability of urban planning, its predictive limits must be considered when it comes to addressing an increasingly diffuse and changing demand over time (in terms of both the demand for residential use and for land for business activities). The definition of urban planning that adapts to certain requirements of demand that almost certainly will have little or no validity 15 or 20 years after the planning period allows urban planning to be addressed under the criteria of future opportunity and adaptability over time. See A. Jover and M. Morell, Study on the Report "Competition Problems in the Land Market in Spain," Issued by the National Competition Commission, Working Group on Urban Planning and Land Management, General Council of Economists of Spain, 2014. Available from http://www.economistas.org/Contenido/Consejo/ Urbanismo/MemoriaGTUrbanismoSobreMercadoSueloCNC.pdf).

06

Future economic and financial scenarios, and the ability to anticipate macro- and micro-economic behaviour

The information relating to any cost or unit price refers to a particular moment or period in time and a specific region or market. Forecasting price trends over the years planned for the implementation of the approved project entails making an analysis of market conditions at the time corresponding to the cost and price information.

Urban development projects are longterm projects; hence, future scenarios will always be in the long term. Consequently, it is necessary to forecast a supply and demand scenario for real estate products. The first impression the reader will have is incredulity when talking about a future scenario that is often 10, 15, or 20 years away.

Nevertheless, this component is an integral part of any investment project; risk is a cost that, as explained in previous sections, needs to be incorporated in order to attract resources to an urban planning project.

Making forecasts does not mean that reality will follow long-term predictions to the letter. Making long-term forecasts means formulating reasonable hypotheses of cost behaviour, income rates, and inflation that allow an analysis of the financial feasibility of an investment to be made, and that allow for evaluation of the investment's capacity to withstand variations in costs, prices, and time. It is an exercise to establish whether a project is reasonably practicable and has staying power. Future scenarios are not formulated to be met, but rather as an initial step to see how they will behave under reasonable and different assumptions of costs, prices, and time. But the confidence factor of any prediction only makes sense to the extent that the person who formulates it is involved in its outcome. In this respect, the forecast is not a theoretical exercise but rather a road map for the entrepreneur who assumes the risk in leading the process, whether public or private.

Economic literature, like literature in many other social science disciplines, is accustomed to considering the future in terms of behaviour patterns observed in the past. This obviously has two major shortcomings: On the one hand, the non-inclusion of the process of globalization, with all its consequences, and on the other, the difficulty of incorporating unknown future developments into these forecasts. When defining a future scenario as part of a feasibility analysis, the expert in investment analyses works with market information and also with the long-term macroeconomic forecasts of the country or region in question (when these are available).

With regard to the future scenarios of real estate market prices, certain restrictions that might determine future forecasts should be taken into account:

• Land management and planning: The adoption and implementation of territorial plans (structural plans at state, regional, or supra-municipal levels) include determinations that, in many cases, aim to fundamentally alter residential and demographic growth, the scale of operations, and the mix of real estate products. Consequently, the new realities arising from this new territorial strategy can change the rules of the game that were established when the country did not have a proactive territorial model in place and when growth was messy, scattered, and segregated. These large-scale territorial operations that dramatically transform some cities tend to be supported by the strengthening of transport and communication networks. It is important that the economic activity enabled by these transformations justifies these large infrastructure investments. All these more ambitious operations anticipate investments in infrastructure and the extension of deadlines by which the market can absorb these major operations, with important impacts for both the public and the private sector. This is what is meant when referring to the new realities in urban planning operations on a territorial scale. The intention of PCE is to provide adequate supply of serviced, buildable plots and units to prevent the rapid rise in the price of formal real estate and therefore prevent slums and informal settlements. However, a well-planned, serviced, and connected area with good public spaces may be considered prime real estate. Therefore, it is difficult to predict how these forces (increased supply and demand for serviced real estate) will balance.

• The time taken by the market to absorb the volume of new real estate

products: Assessing the market's capacity to absorb the real estate products proposed by the plan under analysis is crucial to estimating the annual amounts dedicated to marketing the different products. To obtain sound arguments for the accrual/ deferral of potential revenue, it is necessary to address the following concepts and market parameters: rate of construction and prices of finished housing in the municipality and/or surrounding area (real estate supply capacity); rate of housing transactions and prices in the municipality



and/or surrounding area (demand absorption capacity); demographic forecasts; and property stock pending placement on the market (alternative options to those offered by the sector, potential of housing in developed sectors pending consolidation, etc.). To estimate the period of time for the absorption of the real estate products proposed in the sector under assessment, it is necessary to position the planning in relation to its surroundings and potential competition.

Phase in the real estate cycle: Real estate cycles have a direct relationship with economic cycles, with the chance that property bubbles may form during the expansive phases of these cycles. It is therefore possible to divide the real estate cycle into four distinct phases:

 recovery, 2) expansion, 3) contraction, and 4) recession. To be able to forecast future performance, it is essential to identify, in each territory under analysis, the phase of the cycle it has reached, and whether today's prices reflect a balance between supply and demand, or if they are lower for

circumstantial reasons (buyers' inability to find financing, high unemployment rates, lack of credit available for property developers, etc.), or overvalued due to a process of real estate expansion that reflects the formation of a property bubble. Every possible piece of information must be extracted from the different sources available. There are public and private institutional sources that publish statistical data on the phases of the real estate cycle in numerous cities and countries. The market is very diverse in terms of building types, surface areas, urban zones, and new or second-hand housing. Depending on the profile of each operation, it is necessary to try to extract the statistical indicators of interest

Families' homebuying efforts: From the point of view of demand, it is essential to identify the effort that families need to make when it comes to buying a home in the area under analysis. It is not enough just to know the sales prices on the market; it is essential to identify whether this potential offering is affordable to the local populace and whether the real estate products proposed in the planning will be in demand with this particular market and population segment. This may reveal the need to produce social housing for certain population segments, which population segments are the targets, what resources they have to buy property, and what the maximum sale or rental prices are.

One of the most serious problems when it comes to determining the effort of families is that there is no disaggregated regional information on family income and its distribution. This makes it very difficult to reasonably establish the point(s) of equilibrium in pricing between supply and demand.

Once the above determining factors have been noted, it is possible to correctly diagnose the current situation and to establish reasonable price forecasting criteria aligned with demand. This change in mentality is very difficult to instill due to the inertia that generally prevails in these types of projects.

07 Inflation: The feasibility analysis in nominal or real terms

A prior discussion touched on the precursors and forecasts of both costs and revenue. Historical series tend to be expressed in nominal prices, i.e., without deducting inflation. For example, consider an increase of 15 per cent in the final price of a real estate product over a year, a period in which inflation rose from 0 per cent to 10 per cent. That product will have had a nominal price increase of 15 per cent, and a real (inflation-adjusted) increase of 5 per cent. In countries with high and very volatile rates of inflation it is always advisable to work in real terms and isolate the inflationary effect. Even in countries with more stable inflation rates it is also suggested in some cases to work in real terms, so as to account for the inflationary effect of a project that already incorporates multiple variables and uncertainties.

Nevertheless, when working with nominal or real series, in terms of both cost and revenue flows, future forecasts should be formulated in nominal and real terms and should use a decided-upon discount rate appropriate to the analysis. For example, if the analyst decides to conduct the quantitative analysis in real terms, then the inflation rate must be incorporated into the discount rate:







Source: African Financial Markets Initiative (African Development Bank)

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These considerations could open the door to a range of reflections about measures of inflation, explanatory factors of the behaviour of costs and prices, etc. This guide does not intend to provide a comprehensive overview of this topic, but rather aims to help resolve the usual challenges faced by the analyst when looking at an investment project.

Because the consumer price index (CPI) is a well-regarded and widely used deflator, analyses of revenue and cost flows almost always reference nominal or real values in terms of the CPI.

However, efforts have been made to analyse the different behaviour of real revenue and costs based on different deflators (for example, using CPI for potential revenue and specific indicators for building or civil works costs). In any case, it is essential to ensure consistency between the nominal or real nature of the discount rate and the nature of the deflator. When forecasting real estate sales prices based on a past trend, it is essential to consider inflation over the same period. That way forecasted nominal prices can reflect both real market trends and inflation. The trouble is that many times inflation forecasts are not reliable or not available. All this is to say, it's better to work with real figures.

Above all, analyses must maintain consistency between cash flows and discount rates. If working with nominal cash flows, nominal discount rates must be used; conversely, if working with real cash flows, real discount rates must be used. Properly applied, the end result will be exactly the same.



08

Differences between feasibility assessment for an individual landowner and for an entire plan area

There are important differences between a feasibility assessment for an individual landowner and for an entire plan area.

The feasibility of a landowner investment is conditional upon when the land was bought and how much it cost, the cost of pre-existing factors subject to compensation, the value of this compensation, and the particular cost of capital of the operator (whether or not it is the owner of the land) and its tax status.

On the other hand, analyses of the feasibility of an area start from the following assumptions:

 The land is valued by the dynamic residual method and relates to the start of the process of drawing up the plan.

- The cost flow includes all the urban development charges envisaged in the plan, without assessing the balance, for example, between the company's internal value of the assets and rights that are incompatible with the plan, and the cost of compensation.
- The cost of capital is not defined in terms of the capital costs of each individual landowner, but by general market criteria.
- The financial resources released in a project are evaluated before tax, since taxation on the outcome will vary depending on the legal status of each landowner.

In general, anyone who has bought land pending development at a good price will have more leeway to implement the urban plan than someone who bought the land at a high price. Also, anyone who has a low capital cost will have more flexibility than someone operating with higher capital costs. Consequently, the feasibility and the profitability of an investment have nothing to do with the feasibility and profitability analysis that each individual landowner might carry out (whether public or private).

Demonstrating feasibility entails showing that the set of investments that plan implementation requires will generate sufficient financial resources to guarantee the appropriate discount rate, and if the purchase price of the land has not been introduced as another component in the cost breakdown, to remunerate the purchase of land equal to or higher than the market values that have been identified based on fieldwork and secondary sources of information.

09

The financial impact on public finances

As previously noted, the public sector feasibility assessment is not the same as its private sector counterpart. While obviously related, they have different objectives. In contrast to the latter, the former considers the plan's impact on the public finances of the government entity responsible for the implementation and maintenance of the required infrastructure, and for the implementation and provision of the urban services necessary to guarantee the ordinary operation of the new city proposed in the planning (these public administrations may include city councils, regional bodies, the state government, etc., depending on the responsibilities reserved for each entity in the country in question).

In other words, a public sector feasibility assessment answers the following questions: Can the relevant government entity handle the public investments called for by the plan? At which point can it do so? Can the local municipality maintain the new city proposed by the plan once it has been established and is running at full capacity?

When drafting an urban plan, it is necessary to factor in the financial health of its main guarantor: the government.

Every urban plan will have a financial impact on the public finances of the entity that has to manage and maintain the model once it has been consolidated (usually the town or city council). Public sector feasibility as applied to urban planning helps to define, among other things, the fiscal balance that the proposed plan will engender, the role that the government can play in meeting the challenges resulting from the urban plan (through housing policies that address a particular volume of demand, support infrastructure for business activities and/or citizens. etc.), and the production of agendas, plans, and schedules based on financial criteria.

9.1. Parameterization and urban costs of the PCE

To successfully carry out a public sector feasibility assessment, it is necessary to know the overall planned land uses, and the costs of implementing the plan (this refers to transportation infrastructure, public facilities, urban parks, service networks, etc.). Based on this data, it is possible to estimate the plan's financial impact on the budgets of the government entities involved. As shown in Figure 7, the minimum urban planned land uses that should be taken into account are:

- The total number of new homes and the potential increase in population resulting from implementing the plan (as compared with the population at the time the plan was drafted).
- The growth envisaged in the plan for urban parks and open spaces, new public facilities, and new thoroughfares (streets, roads, etc.).
- Investments in transport and communication networks resulting from the territorial scale change stemming from the transformation of the given area.

In addition, any urban plan should include a series of capital investments that must be taken into consideration when assessing the plan's public sector feasibility. As noted previously, these include public investments in infrastructure, equipment, and social housing. There must be sufficient information to assign each of the planned investments to the relevant body (see Table 8, which provides examples from Rwanda). It is essential to identify major stakeholders and the costs that each will be expected to bear.

Figure 7: Urban planning parameters of the PCE for analysing public sector feasibility





Total number of new homes and potential population increase



Table 8: Allocation of investments in services and basic urban planning, by stakeholder

BASIC FACILITIES (TOTAL INVESTMENTS) S										STAKEHOLDER ALLOCATION (%)			
		Investment	Needs	Units		Unit price (x1,000 Rwf)	Needs for extension	Total cost (x1,000 Rwf)	Private developer	City council	Regional district	State government	Others
Streets													
	Paved	Public		1	Km	14							
	Unpaved	Public		1	Km	4							
	Street upgrading	Public		1	Km	27,750							
P 1A	Total roads	Public		1	Km	4	462,253	1,849,012				100%	
P 1B	Total roads	Public		1	Km	4	462,314	1,849,257				100%	
P 1C	Total roads	Public		1	Km	4	398,531	1,594,124				100%	
Electricity			10 Kw/HH/day										
	Power station	Public / private				Not included	Not included	0	50%	50%			
	Network			1	Km	54,245	66	3,588,603				100%	
Water			9.5 m3/Ha/day										
	Plant	Public		1	-	1,070,000	1	1,070,000				100%	
	Network	Public		1	Km	17,308	66	1,144,989				100%	
	Potable WAP	Public	Within 250 m	1	-	Not included	Not included	0				100%	
Sewerage		Public		1	ERU	10,635	9,476	100,782,870				100%	
Public lighting		Public	Lamppost	1	Post	1,095	0	0				100%	
Internet		Public		1 GbE		Not included	Not included	0				100%	
SWF		Public		1		446,707	1	446,707				100%	
Cemetery		Public / private		1		Not included	Not included	0	100%				
Study fees						6%		6,739,534				100%	
Miscellaneous						10%		11,232,556				100%	
TOTAL								130,297,652					

9.2. Financial impact of public funding

Once the planned growth is realized, new expenditure and revenue scenarios will arise for the affected government entities, particularly the city councils and their local treasuries. Thus, when evaluating public sector feasibility, it is necessary to thoroughly examine the following aspects of budgets and payments:

- The municipal financial situation, based on an analysis of current revenue and expenditure, as well as the city's capacity to generate gross current savings to increase its capacity to self-finance.
- The municipal financial situation, based on an analysis of the city's financial accounts, its capacity for internal financing, or its need for external financing to fund the capital investments required by the plan.
- The investment effort of the municipal treasury in the last few years. It should be noted that each cultural, administrative, economic, and political situation is different, and that in some countries the investment efforts will fall mainly

on the state and/or regional government and not on municipal authorities.

Future borrowing capacity to enable new investments, or the need for subsidies or specific grants from national or international bodies to fund the investments defined in the plan.

Based on the past performance of the public treasury responsible for funding the urban services required by the plan, it is possible to extrapolate future performance and estimate the impact the new plan might have on the future operating revenue and expenditure of the municipality in guestion. When it comes to calculating this future impact, it is advisable to limit the revenues to sources such as taxes and duties, and to circumscribe current expenditure to maintenance directly associated with the plan under analysis. Table 9 shows that current revenue centres on fixed assets, taxes on land concessions, etc. Each country has its own municipal fiscal structure, and depending on where the analysis is undertaken, there will be different tax structures and recurrent expenditures to consider.

Based on the past performance of the public treasury responsible for funding the urban services required by the plan, it is possible to extrapolate future performance and estimate the impact the new plan might have on the future operating revenue and expenditure of the municipality in question.

Table 9: Estimate of the impact of an urban plan on current municipal revenue and expendit

L District own revenues						
Value of pop exempt properties	Owner occupancy rate	Share of properties with	Collection rate	Solf according to a	Ρογοριίο	Porpotuity
value of non-exempt properties		freehold		share of value		repetuity
1,254,664,133,850.00	50%	50%	33%	50%	103,509,791.04	5,750,543,946.70
I.1.3. Rental income tax						
Units non exempt properties	Rate	Properties below Rwf 180,000	Renter occupancy	Collection rate	Revenue	Perpetuity
21,447.00	10%	50%	90%	30%	121,604,490.00	6,755,805,000.00
I.2.1. Fees charged by district						·
I.2.1. Market fees						
Current markets	Current revenues from mar	kets			Revenue	Perpetuity
6	217,770,000.00				108,885,000.00	6,049,166,666.67
I.2.6. Fees on land lease						
Sq. M of non-exempt properties	Owner occupancy rate	Share of properties without freehold	Collection rate		Revenue	Perpetuity
4,725,351.00	50%	50%	33%		54,577,804.05	3,032,100,225.00
I.2.9. Fees on public cleaning services						
Sq. M of commercial establishments	Commercial establishments	Monthly fee	Collection rate		Revenue	Perpetuity
1,404,702	14,047	5,000	100%		842,820,000	46,823,333,333.33
I.2.11 Fees charged on provision of land and plot related services						
Permits and approvals					423,920,310	423,920,310
Land registration					16,536	16,536
Other fees charged by the district					103,946,398	5,775,799,869
I. District current expenditures						
	Max unit price	Avg unit price	Land use area (SqM)	Floor area (SqM)	Revenue	Perpetuity
I.2. Goods and services (BF maintenance and operating expenses)					6,120,713,392	340,039,665,086
Streets (Rwf/SqM/year)	0	0			69,970,847	3,887,269,292
Public lighting (Rwf/SqM/year)	0	0	0		0	0
Sewage (Rwf/SqM/year)	0	0	9,476		0	0
Urban center park/neighbourhood park (Rwf/SqM/year)	0	0			0	0
Solid waste facility (\$/SqM/year)	0	0			0	0
Other maintenance operating expenses	0	0			6,050,743,124	336,152,395,794
Total operating balance (operating revenues and maintenance costs)					-4,361,415,643	-265,428,979,200
Grants and transfers (from central government, agencies and donor funds)					8,173,619,078	454,089,948,761

Apart from this current fiscal balance taken from the current operations of the newly constructed city, it is necessary to analyze the financial capacity of the stakeholders responsible for assuming the capital investments under the plan. Generally, the capital investments required to implement a PCE are very high. Relating these investments to the financial capacity of the relevant public agents will enable a determination of the feasibility of the plan under analysis.

The public sector feasibility analysis allows for an assessment of the relevant government entity's ability to implement the required investments. It thus enables the development of a financial plan that addresses issues such as:

- Prioritization: In most cases, public entities will have to prioritize investments in order to implement realistic and feasible development plans.
- Public taxation: The PCE in developing countries will need, in many cases, to be accompanied by progress on tax matters linked to increased value generation in areas of urban development. Future

public sector feasibility of these developments will require greater management capacity to generate ordinary fiscal revenues to finance current expenses.

Public and private participation in urban development: The private sector feasibility assessment allows private developers to see how they can benefit from certain actions called for by the plan. This kind of participation can contribute to the plan's public sector feasibility by value capture processes.



Glossary

Cost components

Cost components allow us to know the determinants of the cost of any good. Types of urban development costs include planning costs, permits and approvals, basic infrastructure and community facilities, building costs, entry costs of final products in the market, and time costs. It is very important to have a complete list of these costs.

Moreover, the urban development of a given territorial area generates some costs that involve cash movement, and others that do not but that nonetheless need to be accounted for. The former include the payment of taxes, the payment of building costs, and the payment of fees for professional services. The latter include the free transfers of land to the government (streets, green parks, etc.) if applicable, possible subsidies and tax abatements, etc.

For the sake of transparency, the financial feasibility analysis should acknowledge all costs of urban development.

Discount rate

The rate of return expected by real estate developers for comparable projects. This can be seen as the opportunity cost of capital, or the "hurdle rate" above which a project is a good financial investment.

Financial feasibility

When considering private sector real estate investments, financial feasibility refers to the ability of a given planned area to generate a financial balance between the urban responsibilities and costs incurred, and future income that may potentially generate final property products as a return on investment (in terms of profitability). Assessments of private sector financial feasibility focus on the proposed investment by potential developers during the process of urban development, limiting their analysis to the components of implementation borne by the developers in guestion, which may include infrastructure provision in addition to building construction

Financial feasibility from the public sector perspective analyzes the role of public entities in the plan under assessment, and the impact of their actions on their public finances, in terms of the investment incurred, the future maintenance of infrastructure and the provision of urban amenities for citizens (street cleaning, maintenance and management of facilities, waste collection, urban park maintenance, etc.), the potential revenues from taxes and fees to be generated, and other budgetary resources, such as transfers, which can be used for plan implementation. Thus, financial feasibility refers to the degree of budgetary balance or imbalance that the ordinary costs of the plan may cause in public budgets once implemented, and any potential (mainly tax) income, plus the ability to assume any planned financing of capital investments.

General urban planning

In the present guide, general urban planning is understood as the structural and functional organization of a municipal or regional territory, the rules of its possible development and use, the responsibilities of the public and the private actors, and the future preservation of undeveloped and public land. Urban planning tends to be an operational tool for the short and medium term and must develop territorial planning guidelines.

Intermediate and final demand

The urban planning and urban development process must aim to make available to the market products and services that citizens and businesses need for their social development. Housing, industrial buildings, offices, and public services are designed to meet final demand.

Final demand refers to the citizens, businesses, and governments that need products and services of an urban environment in which they can meet their needs.

Producing goods and services for final demand necessitates a complex production process in urban areas, a process that involves numerous specialized actors. These include professional services for designing real estate projects, project management services, financial services, procurement and coordination for civil works, building contractors, marketing services, and maintenance companies, among others. Throughout this process, assets are transmitted in the production process. Therefore, the demand operating in between stages of the production process is called intermediate demand.

Demand for lots, for example, is an intermediate demand, as lots are transformed into final real estate products. Urban planning does not seek to generate lots, but seeks to generate final real estate products.

Internal rate of return (IRR)

IRR refers to the percentage gains an investor can expect to receive based on expenditures and revenues over time. The IRR of a project must be high enough to compete with similar potential investments and compensate for risk inherent in the investment. The IRR is the discount rate that makes a given project's net present value equal to zero.

Net present value (NPV)

When considering an investment that may have varying costs and revenues over time, the NPV is the value of the investment in present day terms, factoring in the cost of time.

Planned land uses

Land use refers to classification of activities taking place on the land, and sometimes the density of floor space. Classifications typically include residential, commercial, office, industrial, public space, and many more specific categories.

There are many ways to formulate urban plans. A plan that assumes implementation exactly as prescribed requires many specific quantities regarding planned land uses. In contrast, an urban plan that simply seeks to avoid the dysfunctions of urbanism probably will not prescribe land uses in as much detail. Finally, other urban plans entrust their implementation to a process of dialogue among the various stakeholders. When assessing feasibility of a given plan, it is often necessary to estimate the quantities of floor space and building types that will likely be developed.

Urban development

The urban planning process spans the physical, legal, and functional transformation of the territory. Urban development is usually broken down into the planning phase, the land servicing phase, the building and marketing phase, and the maintenance phase.

The final effects of urban development include houses for citizens, industrial buildings and offices where people can work and produce, shops and retail establishments where citizens can provide themselves with goods, community facilities providing urban services, and transportation networks. These effects are a basic condition for urban well-being and also a basic condition for the generation of wealth within a country. Urban development is thus the whole process of transformation of a given territory.

Urban planning and the role of public and private actors

An enormous variety of cultures and traditions shape how public and private actors operate in the realm of urban planning. This guide explores the case of a large private developer that will develop multiple units at once and then lease or sell them. Such private real estate development may or may not include servicing the land with basic infrastructure.

In reality, there are many models with public and private sector actors dividing

the roles within the development process differently. In some cases, the public sector provides infrastructure and the private sector constructs the buildings. Other times, the public sector may construct the buildings, particularly in the case of social housing. In other cases, there are no large developers and instead individuals and households construct their own units. These roles should be determined with consideration of administrative competencies, shared costs, shared profits, impact in terms of conservation and maintenance of the environment, shared land capital gains, value capture processes, etc.

Value and price

To analyze the financial feasibility of an urban plan, it is necessary to assign values to final real estate products that generate income, that is, assets aimed at effective final demand. In this context, value refers to the likely value at which the market tends to match supply and demand. Determining this requires conducting field work and/or analyzing market data available for different products and uses, usually from statistics of quantities and prices of the final products (houses, offices, retail buildings, industrial buildings, etc.). All of these sources allow for a statistical approach to express probable market values.

The price, however, is the monetary value of a particular transaction. While there are many possible market values, there is only one possible price (and only if the transaction comes to effect).

The reasons why a potential buyer may be willing to offer a certain price may have nothing to do with the market value and much to other factors. To gain more confidence in a financial feasibility analysis, representative market parameters should be used. HS Number: HS/072/16E

United Nations Human Settlements Programme (UN-Habitat) P.O. Box 30030, Nairobi 00100, KENYA Telephone: +254-20-7623120, Fax: +254-20-7624266/7 Email: infohabitat@unhabitat.org



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