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to Planning and Development Control

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Applying Real Estate Financial Analysis to Planning and Development Control

David E. Dowall

This article presents basic techniques of real estate analysis necessary to assess development projects and design market-responsive planning and development controls. It discusses the importance of real estate analysis in planning, whether one is controlling land development, promoting low- and moderate-income housing, enhancing the aesthetics of urban design, or revitalizing the local economy. The real estate pro forma analysis is explained and applied to four planning settings: industrial development, inclusionary housing, urban design exactions, and public-private partnerships. Suggested readings are provided.

Why should planners bother with real estate?

During the 1970s the relationship between planners and real estate professionals was uneasy. But things are changing now. Fiscal and economic development pressures are forcing many cities and counties to work closely with developers to create projects of mutual benefit, and planners are frequently called on to assist developers with office, industrial, and commercial projects (see, for example, Wiewel, de Bettencourt, and Mier 1984). In this new environment planners need to understand the mechanics of real estate financial analysis. Otherwise, they may be out-negotiated and possibly hoodwinked by developers.

This article provides a few basics about real estate and suggests when and how real estate analysis can help planners, whether they are responsible for controlling land development, promoting housing opportunities for low- and moderate-income households, enhancing the aesthetics of urban design, or revitalizing the local economy. The principal tool of real estate analysis is the *pro forma*, a projection of the economic and financial performance of a proposed project. Planners should use pro formas as developers do, to gauge the sensitivity of projects (in terms of operating income and profit) to changes in planning regulations and government incentives.

Dowall teaches urban land economics and land use planning in the Department of City and Regional Planning at the University of California, Berkeley, and is principal investigator of a study on the nation's construction and development industry. His most recent book, The Suburban Squeeze (University of California Press, 1984), concerns land use planning and housing markets in the San Francisco Bay area.

There are four distinct areas where real estate expertise can help: when you are administering a development program and a developer/applicant requests a relaxation in regulations or asks for some financial assistance for the project; when you are designing a land use or development regulation; when you are asked to design an incentive program that will entice developers to provide some public amenity or benefit; and when you are creating a joint venture relationship with a private developer to co-develop a project—the much touted “public-private partnership” (see, for instance, U.S. Department of Housing and Urban Development 1980).

This article uses four settings to illustrate how real estate pro forma analysis can be applied to planning. Each setting is based either on an actual case or on a composite of several cases.¹ I also have suggested some readings for more detailed guidance.

Setting 1: When a developer says he can't pay the fees and exactions

Cities and counties routinely use development fees and user charges to generate revenues. They also are interested in promoting development to create jobs and expand local economies. But those goals are often contradictory. The contradiction arises when a developer who is proposing a highly desirable project requests financial assistance from the city, claiming that the city's required fees or off-site improvements make the project infeasible. What can you do about that as a planner?

An example from Portside, an industrial community in the San Francisco Bay Area, provides some insights (see Dowall et al. 1982). When a developer says a project is financially infeasible, he usually means the income from operating the project and the potential

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income from selling the project would not be sufficient to pay all development and operating expenses and still provide him with adequate profit. A clear case of infeasibility is when the income from operating (renting) the project is insufficient to pay operating expenses and the mortgage loan used to finance the project. More often, though, the project is on the margin of feasibility, generating enough cash flow to cover expenses and mortgage payments, but not quite enough to provide a satisfactory profit.

This situation came up recently in Portside, where community leaders were concerned about losing industrial jobs. Recently Portside embarked on a program of industrial development. One of the first projects to be proposed was a small-unit industrial project. (Photo 1 shows a typical small-unit project.) The developer approached the planning department with a request for financial assistance, claiming that the city's high impact fees and off-site improvements were killing the project. According to the city's requirements and the project's size and characteristics, the total cost of the fees and off-site improvements was \$605,000. The developer requested a waiver of the fees and a grant of \$400,000 to assist in the construction of the off-site improvements.

The planning director said she would study the developer's request. She decided she needed an independent assessment of the project to determine the validity of the developer's claim. If her assessment revealed that the project would not meet the normal financial performance standards developers use to evaluate potential projects, she would consider offering some incentive. The city was eager to have economic development, but she was well aware of cases where cities had been hoodwinked into subsidizing highly profitable projects. Below we review the steps the planning director took in assessing the request.

First, she developed a financial assessment of the project, assuming no city support. This is presented in pro forma statements of the project's costs and operating performance. Table 1 presents the costs of building the project. To estimate specific cost items independently, she discussed the project with real estate and construction professionals and members of the city's public works staff. She also consulted several companies, such as F. W. Dodge, which provide detailed construction cost information (F. W. Dodge 1984). She could estimate costs for construction financing, architectural and engineering fees, legal, title, and impact fees, as well as property management costs for leasing the project, by talking with lending, design, legal, title, and property management professionals and city staff members. Table 1 indicates that total project costs were \$7,437,600.

With the total project costs estimated, she next prepared Table 2 to estimate how the project would perform economically if it were built without subsidies. The project, an industrial building with 186,000 square feet of rentable space, was likely to rent at \$0.36 per square foot per month (escalating by 8 percent per year). At 100 percent occupancy, gross scheduled income would be \$803,520 for the first year. This had to be adjusted downward to reflect vacancy. (In Table 2, vacancy was assumed to be very high in the early years reflecting the time necessary to lease all the space in the project.) This adjustment yielded effective gross income. Next, costs of operation had to be calculated. Operating costs depend on the type of lease offered. Industrial users normally lease space on a "triple-net" basis, where the lessee pays all expenses, maintenance, property taxes, utilities, and insurance. The only expenses for the developer/owner are property management, building repairs, and incidentals. The planning staff could estimate those costs by



Photo 1. Typical small-unit industrial building (photo by Michael Smith-Heimer)

Table 1. Cost analysis of a leased small-unit industrial project

Land acquisition (including carrying costs)		\$1,389,375
Off-site improvements required by city (streets, utilities, etc.)		525,000
Facility construction		
10 percent office space at \$25/ square foot	\$465,000	
Industrial space at \$20/square foot	<u>3,348,000</u>	
Total facility construction		3,813,000
Construction loan interest		
\$5.5 million at 16 percent for 14 months at 60 percent average draw	\$616,000	
Construction loan fee (3 points)	<u>165,000</u>	
Total construction loan interest		781,000
Legal, title, architecture, and engineering fees		155,000
Impact fees		80,000
General administrative expense		360,000
Property management fee (3 percent of gross income)		34,225
Contingency		<u>300,000</u>
Total costs		\$7,437,600

talking with property managers and building owners and by reviewing operating cost data put out by professional organizations, such as the Society of Industrial Realtors (1984). Net operating income is the difference between effective gross income and operating expenses.

Next, the net operating income could be used to determine the amount a bank would loan on the project. Banks use a technique called *income capitalization* to determine the market value of a project.² The market rate of return on similar projects, expressed in terms of annual cash return (before taxes) as a percentage of the total value of the project (usually the asking price), is used to determine a market value for the project, based on its cash flow. An example

will help here. If projects similar to the one proposed generate a 10 percent annual return on the initial investment, and if the net operating income of the project when it stabilized in year three would be \$845,178 (from Table 2), then an investor would be willing to pay \$8,451,780 for the project. This \$8,451,780 is the capitalized value of the project. Banks normally lend 75 percent to 80 percent of the value of a property. In this instance, the bank would lend 75 percent, or \$6,338,825, for thirty years at 13 percent. A loan of these terms would require an annual mortgage payment of \$841,442 per year.

Next the planning director calculated taxable income from the building. For purposes of computing taxable income the U.S. Internal Revenue Service permits owners of property to deduct the interest portion of mortgage payments and an amount reflecting the decline in the economic value of the property resulting from wear and tear and obsolescence (*depreciation*). The amount of interest on the mortgage will depend on the terms of the mortgage and the stage of amortization. As illustrated in Table 2 the interest portion of the debt service declines slightly each year because each year a portion of the principal is repaid. The amount of depreciation that can be deducted from income each year depends on three criteria: the economic value of the property, the value of the land, and the tax code definition of the economic life of the property. The charge for depreciation is based on the value of the buildings and improvements, not the value of the land (because land does not depreciate). Thus, the annual charge for depreciation is the total cost of the project, less its land value, divided by the IRS-specified economic life (currently eighteen years). For the proposed project, depreciation was the total cost (\$7,437,600) less \$1,389,375 for the value of the land, divided by eighteen to determine the annual depreciation charge (\$336,013). The tax was assumed to be the highest federal rate, 50 percent (we are ignoring state taxes in this example).

The after-tax cash flow (net operating income minus total debt service, minus taxes) was computed next. In most cases, mainly because of the deductions for depreciation, taxes are negative. The resulting after-tax cash flow goes to the developer and can be estimated for each year the property is held. Before she could estimate the developer's return on the project, the planning director had to estimate the profit made upon sale of the property. In Table 3 she assumed that the property would be sold at the very end of the fourth year.

The selling price in the fourth year was estimated based on a 10 percent capitalization of fourth-year net operating income, or \$9,240,480. The capital gain is the net sale proceeds (sales price less sales expenses) minus the depreciated value of the property (its *basis*). The basis is determined by subtracting from the original

Table 2. Financial analysis of unsubsidized small-unit industrial project

	Year 1	Year 2	Year 3	Year 4
Operating income and expenses				
A. Gross scheduled income	\$803,520	\$870,480	\$937,440	\$1,004,400
B. Vacancy	(473,001)	(266,646)	(66,123)	(50,220)
C. Effective gross income	\$330,519	\$603,834	\$871,317	\$954,180
D. Operating expenses	(9,916)	(18,115)	(26,139)	(30,132)
E. Net operating income	\$320,603	\$585,719	\$845,178	\$924,048
Loan amortization				
F. Capitalized value	\$8,451,780			
G. Loan amount	\$6,338,825			
H. Debt service at 13%	\$841,442	\$841,442	\$841,442	841,442
I. Principal payment	18,468	21,017	23,918	27,220
J. Interest	\$822,973	\$820,423	\$817,524	\$814,222
Income taxes and cash flow				
K. Straight-line depreciation (18 years on \$6,048,225)	\$336,013	\$336,013	\$336,013	\$336,013
L. Taxable income (row E minus row J minus row K)	(838,383)	(570,717)	(308,359)	(226,187)
M. Income tax (50% of row L)	(419,192)	(285,359)	(154,180)	(113,094)
N. After-tax cash flow (row E minus row F minus row M)	(\$101,647)	\$29,636	\$157,916	\$195,700
Equity reversion (from Table 3)				\$1,920,939
Fourth-year cash flow (equity reversion plus after-tax cash flow in fourth year)				\$2,116,639

total cost of the project (including land) the depreciation deductions taken over the four years. In this case the basis was \$6,093,548, and the capital gain was \$2,594,503. The maximum federal capital gains tax is 20 percent (the result of applying the 50 percent maximum tax rate to 40 percent of the capital gain); therefore the tax was \$518,901. The developer's gain on sale is the net sales proceeds minus taxes and outstanding loan balance. This gain can be added to fourth-year cash flow from operations to determine the developer's cash flow.

Since she estimated the annual cash flows including sale proceeds, the planning director needed only to determine the developer's equity contribution. The project cost was \$7,437,600, and the bank lent \$6,338,835; so, assuming the rest of the costs were paid by the developer at the front end, the equity would be \$1,098,765. Now, with all of the project cash flows estimated, the planning director was able to calculate the developer's financial return. She decided to use a measure of financial performance known as an *internal rate of return* (IRR). This measure is widely used by real estate developers; it is the annual percent return on equity investment that equates the present value of future income of a project (from either operations or sale) to the initial equity investment

(see Messner et al. 1979 for an explanation). Based on her pro formas, the planning director estimated the developer's operating and equity reversion (after-tax gain resulting from the sale of the property) cash flow to be the following for the four years of ownership: -\$101,647, \$29,636, \$157,916, and \$2,116,639. (See Table 2.) This cash flow would represent an IRR of 18.6 percent.

After several days of collecting construction cost and marketing information and building the pro for-

Table 3. Equity reversion on sale of small-unit industrial project

Sales price (10 percent capitalization of fourth-year net operating income)	\$9,240,480	
Sales expenses	- 554,429	
Net sales proceeds	\$8,688,051	\$8,688,051
Basis	-6,093,548	
Capital gain	\$2,594,503	
Tax on gain (20 percent)		- 518,901
Payment of outstanding loan balance		-6,248,211
Equity reversion on sale		\$1,920,939

mas, the planning director was now in a position to carefully consider the developer's request. Would the project generate an IRR above the developer's hurdle rate (a minimum annual percentage return on investment) for deciding whether to go forward with the project? To answer that question the planning director called several developers who had built successful projects in Portside and nearby communities. She also called two bankers who frequently lent money to industrial developers in the San Francisco Bay area. After, she presented the project to each of them and described the general location and the type of tenants sought to occupy the building, each of them suggested that an IRR in the range of 20 percent to 25 percent would form the critical hurdle rate. All of them, including the developers, indicated that a hurdle rate was subjective, depending greatly on how "hungry" the developer was and whether the project had a firm commitment from tenants and financiers—factors that greatly influence the level of risk. The bankers stressed the way uncertainty influences the hurdle rate. Both of them indicated that lower-risk projects, such as a building specifically constructed for a blue-chip tenant, would have low hurdle rates. On the other hand, a speculative project with only 25 percent of the project preleased would be riskier and would require a higher IRR for the developer to proceed.

Given the circumstances surrounding the project, the planning director decided that the proposal's 18.6 percent IRR was marginal and that, therefore, the developer's claim was valid. She next set out to perform a sensitivity analysis of various levels and methods of providing a subsidy. She had decided that in no instance would she offer subsidies that would enable the developer to achieve an IRR of more than about 25 percent on the project.

There were two distinct methods of providing a subsidy. One was for the city to provide the developer with a cash grant to pay the fees and make the off-site improvements; the other was for the city to waive the fees and off-site improvement requirements. Since the city was facing stringent financial conditions, the planning director first considered the waiver method. Waiving the impact fee was straightforward, but waiving the off-site improvement requirements was more complicated, since omitting the improvements might affect existing and future users adversely. She examined the requirements and concluded that the street-widening requirement could be modified, since the developer was proposing to lease the building to small industrial users not likely to generate heavy truck traffic. She also decided that the lighting and sidewalk requirements could be modified without compromising planning standards. She estimated that modifications cutting as much as \$200,000 from the off-site requirements could be made without causing significant cir-

culation or crime prevention problems. If any further subsidy were necessary, it would have to be in the form of a cash grant.

The planning director modified the pro formas presented in tables 1 and 2. To assess the developer's request, she reduced the total cost of the project by \$480,000, assuming that a combination of fee waiver, off-site improvement modification, and cash grant would be used. Since the loan would be based on the capitalized net operating income of the project, it would remain the same, at \$6,338,835. Thus the developer's required equity would drop by \$480,000, from \$1,098,765 to \$618,765. Using the operating cash flow and the gain from the sale of the project, she recalculated the IRR. She determined that the new IRR would be 36.2 percent, well above the 25 percent limit she believed was appropriate. Therefore, although the developer claimed validly that the project was infeasible, his request for assistance was excessive.

Next the planning director prepared a series of pro forma projections to determine what amount of subsidy would push the IRR into the 20 percent to 25 percent range. She concluded that a subsidy of \$80,000 would increase the IRR to 20.8 percent, and a subsidy of \$230,000 would increase it to 25.6 percent. She now knew the range of subsidy that the city should consider for possible assistance. She arranged a meeting with the city manager and the public works director to develop a detailed list of possible off-site modifications and their costs. With this list she could now negotiate effectively with the developer.

She called the developer to arrange a meeting. She said the city might consider providing some form of assistance and she wanted to discuss possible approaches.

Setting 2: Designing an inclusionary housing ordinance

In many areas of the nation housing costs are very high, making it difficult for households of low and moderate income to purchase housing. As a matter of public policy many communities have responded with inclusionary housing ordinances, which require housing subdivisions above a certain size to provide a percentage of their units for sale at lower prices. The success of inclusionary programs has been spotty. The performance of inclusionary programs in California has been tracked by Schwartz, Johnston, and Burtaw (1981). In some areas of the state a considerable number of affordable units have been built, while in others none has been produced. In many communities, the failure appears to result from poorly designed programs that do not consider the real estate and financial implications of the inclusionary requirements. To illustrate that point, and to show how pro formas

can be used to design incentive schemes, I examine a small residential subdivision from the developer's perspective. The example is drawn from a consulting project I directed for the city of Sacramento (Questor Associates 1981).

In this example, as in the previous one, real estate pro forma analysis is an essential component of the planning decision-making process. Pro forma analysis is used to gauge the sensitivity of an inclusionary housing ordinance and design a voluntary inclusionary housing program.

Assume that Smith, a developer-builder, acquires a ten-acre parcel of land for \$1 million and that existing zoning permits building six units per acre for a total of sixty units. Photo 2 shows a typical project. Assume further that Smith can sell finished single-family units for \$80,000 given the local market conditions. Smith's profit will depend on the cost of the land, the cost of lot improvements, construction and financing costs, and selling expenses. In Table 4, column A presents these costs and the resulting developer profit. The project would yield \$536,000 in profit, almost \$9,000 per unit. If Smith's equity were \$1 million (the land), and the project took two years to complete, the annual return on equity would be about 27 percent. That is the earned \$536,000 on an investment of \$1 million over a two-year period. (In this example taxes are ignored since the results are the same with or without them.)

Now consider the effect of an inclusionary zoning ordinance. Typical ordinances require that 20 percent of the units be sold at "affordable prices" usually determined by local median income levels tracked by the U.S. Department of Housing and Urban Development. In our example, that would be twelve units. Assume that the "affordable" price is \$60,000 per unit, that the lower-cost units are built on the same lot, and that they are identical in size and quality to the market-rate units. In Table 4, column B, cost,

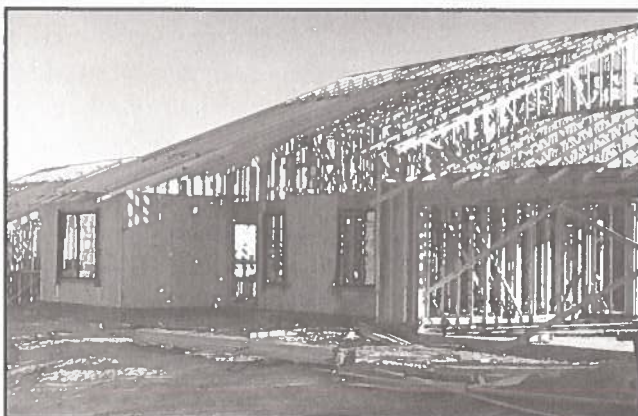


Photo 2. Housing construction in Sacramento (photo by Michael Smith-Heimer)

Table 4. Costs, revenues, and profit, 60-unit subdivision, without and with an inclusionary requirement

	A. Without inclusionary requirements	B. With inclusionary requirements
Costs		
Land	\$1,000,000	\$1,000,000
Building and lot improvements (\$50,000 per unit)	3,000,000	\$3,000,000
Financing (\$2,000 per unit)	120,000	120,000
Selling (3 percent of revenues)	144,000	136,800
Total costs	\$4,264,000	\$4,256,800
Revenues		
Market-rate units (\$80,000 per unit)	\$4,800,000	\$3,840,000
Lower-cost units (\$60,000 per unit)	—	720,000
Total revenues	\$4,800,000	\$4,560,000
Profit	\$536,000	\$303,200

revenue, and profit levels are estimated for the inclusionary alternative.

Now compare columns A and B. Smith's profit is cut 43 percent, from \$536,000 to \$303,200. If the inclusionary project takes two years to complete and Smith's equity is again \$1 million, the annual return on equity is 15 percent, considerably below the 27 percent rate for the noninclusionary project. And there is more risk in marketing the project because of the mix of market and affordable units. Whether Smith decides to go ahead with the project depends on whether he has other alternative projects that will provide a greater return. Smith might try his luck in another community, or attempt to rezone the land for commercial use, or subdivide it into small parcels to avoid compliance with the inclusionary ordinance. Even if he does not have other projects to pursue, he still may not be willing to go forward with the project because the 15 percent return is not acceptable to him.

From the public's perspective the construction of twelve affordable units is desirable, particularly since it requires no public funds. The question is how we can design an inclusionary program that will produce housing. To do that the inclusionary ordinance needs to provide developers like Smith with sufficient incentives to build the inclusionary projects and still earn profits that are acceptable. Let's explore how this can be done, using a pro forma analysis.³

The most effective way to create a sufficient incentive is to amend the inclusionary housing ordinance to increase the density of the project to offset decreases

in profit that result from the inclusionary requirements. This was recommended to the city in the form of a proposal to restructure its ordinance to permit more market-rate units in subdivisions with inclusionary units (Questor Associates 1981).

A simple algebraic formula⁴ can be constructed to determine the necessary number of additional units to offset the profit loss of the inclusionary requirements. The formula solves for the increase in density necessary to exactly offset the reduction in profit associated with the inclusionary requirement. Table 5 illustrates a new cost, revenue, and profit schedule for a project with nine additional units (for a total of 69 units).

The density increase necessary to preserve the developer's IRR depends on the differential in per unit profit between the market-rate and lower-cost units. The actual amount of density that can be added to a project is limited since, ultimately, increases in density will alter the character of the project and, therefore, the market for the units. While admittedly a crude rule of thumb, increases in density of up to 20 percent should not pose a problem if careful site planning is used.

Setting 3: Designing developer incentive programs to achieve public objectives—An urban design exaction

The approach presented above for inclusionary housing also can be applied to requirements for public art, urban plazas, open space, and other amenities (Partners for Livable Places 1982). Suppose that your city wants, as a component of its revitalization plan, to encourage pedestrian improvements, such as arcades, landscaping, or walkways, in its downtown area. (See Photo 3.) Because the city also wants to stimulate commercial development, however, it has



Photo 3. Pedestrian way at Embarcadero Center, San Francisco (photo by Michael Smith-Heimer)

decided not to force developers to provide these amenities. Instead, you have been asked to design a policy creating incentives that would encourage developers to provide pedestrian improvements. What do you do?

Commercial developers engage in development to earn profits. Like the industrial developer in Portside, they use the IRR to measure the returns on their investments. They usually compare the estimated rate for a potential project with a hurdle rate. If a project is forecast to generate a percentage return greater than the developer's hurdle rate, he will go ahead with the project.

Suppose a developer is considering construction of an office building of 100,000 square feet. The total cost of the facility, including land, is \$9 million. When the building is fully occupied it will produce an annual net operating income of \$1 million. This income flow, when capitalized at 10 percent, would produce a project value of \$10 million. The developer's bank will loan up to 75 percent of the value of the project. Thus the developer can obtain a loan of \$7.5 million and put \$1.5 million of his own money in the project. Assuming that the bank loan is a 12 percent fully amortized, thirty-year loan, the annual debt service would be \$925,950. Assuming that the net operating income of the project increases by 5 percent per year, we can estimate future net operating income, sales price, and IRR. (In this example the effects of both federal and state income taxation have been excluded from the analysis for simplicity.)

Table 5. Costs, revenues, and profit, 69-unit subdivision, under an inclusionary requirement

Costs	
Land	\$1,000,000
Building and lot improvement (\$50,000 per unit)	3,450,000
Financing (\$2,000 per unit)	138,000
Selling (3 percent of revenues)	158,400
Total costs	\$4,746,400
Revenues	
Market-rate units (57 at \$80,000 per unit)	\$4,560,000
Lower-cost units (12 at \$60,000 per unit)	720,000
Total revenues	\$5,280,000
Profit	\$533,600

In Table 6, the net operating income is projected for ten years. We assume that at the end of ten years the project will be sold. We estimate the price by capitalizing the net operating income in the tenth year by 10 percent. As in setting 1 above, the developer's gain on sale will be the difference between the sales price and the sales commission paid to a broker and what it would take to pay the balance on the mortgage. The developer's IRR from annual net operating income and sale of the property is 26.4 percent. If the developer's hurdle rate of return is 25 percent, the project will be attractive to him.

Now suppose you want to require an off-site pedestrian improvement fee of 3 percent of the cost of the project. If you did not provide an incentive, what would this fee do to the developer's IRR? Assuming that the fee (in this case \$270,000, 3 percent of \$9 million) is paid up front, the developer's equity contribution would increase from \$1.5 million to \$1.77 million, an 18 percent increase. The projected IRR would fall to 23.7 percent, below the 25 percent hurdle rate. Thus the developer might not want to pursue the project.

We now can explore the various ways of designing incentives to encourage developers to pay into a pedestrian improvement fund. The most straightforward way to offset the effect of the fee would be for the city to provide a reduction in building permit fees or provide some level of service that would reduce the developer's construction cost by an amount equivalent to the fee. The developer would be indifferent to this method, but the city would have to transfer funds from one department to another (from the building department to the pedestrian improvement commission, for example).

Another approach would be to provide a density bonus that would create a cash flow whose present value would offset the cost of the pedestrian improvements. To determine that amount, we again need to develop a pro forma and use it to design an effective planning regulation to encourage pedestrian improvements. Various pro formas need to be developed to identify an increase in building density that would produce a flow of revenues with a present value equivalent to \$270,000. This search is presented in Table 7, for 5 percent increments of additional building floor area. Each floor area increment presents the annual income and expense to the developer, beginning with the additional investment he must make to build more space. The yearly cash flows have been discounted at 25 percent per year, the developer's hurdle rate. The value at the bottom of each column is the present value of the ten-year stream of income associated with the increased density discounted at 25 percent per year. If this discounted rate exceeded \$270,000, the developer would be willing to contribute

Table 6. Office building project, developer's before-tax cash flow (initial developer investment \$1.5 million; yearly debt service \$925,050)

I. Yearly before-tax cash flow

Year	Net operating income	Debt service	Before-tax cash flow
1	\$1,000,000	\$925,050	\$ 74,050
2	1,050,000	925,050	125,050
3	1,102,500	925,050	176,550
4	1,157,625	925,050	231,675
5	1,215,506	925,050	289,556
6	1,276,282	925,050	350,332
7	1,340,096	925,050	414,146
8	1,407,100	925,050	481,150
9	1,477,455	925,050	551,505
10	1,551,328	925,050	625,378

II. Gain on sale in tenth year

Sale price	\$15,513,280
Sales expense	<u>— 930,797</u>
Net gain	\$14,582,483
Repay mortgage	<u>— 7,002,608</u>
Before-tax gain	\$ 7,579,875

III. Before-tax cash flow in tenth year

Tenth year before-tax cash flow (after debt service)	\$ 625,378
Before-tax gain on sale in tenth year	<u>\$7,579,875</u>
Total before-tax cash flow in tenth year	\$8,205,253

the pedestrian improvement fee and obtain the right to increase floor area. In our example this would be the case if the density bonus were just under 25 percent of permitted floor area, an excessive amount. The trade-off probably would generate more congestion costs than pedestrian benefits.

This amount could be drastically cut if the city permitted the developer to pay the fee five years after the project was completed. The present value of the \$270,000 paid in five years (using the developer's 25 percent rate of discount) is \$88,500. Therefore the density bonus necessary to entice the developer to make the contribution in five years is less than 10 percent (see Table 7). By waiting five years, you can still get the pedestrian improvement fee, but with one-third the density bonus.

This example has illustrated how discounted cash flow analysis can be used to design development incentives more effectively. (For an example related to office building height and bulk, see Dowall and Stone 1983.) Data for making the estimates should be obtained from the developer and validated by cross-checking the information on costs, revenues, lending

Table 7. Analysis of pedestrian improvements fee incentive

Cash flows generated by alternative density bonuses (shown as percentage increases in floor area)							
Year	1 Percent	5 Percent	10 Percent	15 Percent	20 Percent	25 Percent	30 Percent
0	(\$5,000)	(\$25,000)	(\$50,000)	(\$75,000)	(\$100,000)	(\$125,000)	(\$150,000)
1	742	3,710	7,420	11,130	14,840	18,550	22,260
2	1,242	6,210	12,420	18,630	24,840	31,050	37,260
3	1,767	8,835	17,670	26,505	35,340	44,175	53,010
4	2,318	11,590	23,180	34,770	46,360	57,950	69,540
5	2,897	14,485	28,970	43,455	57,940	72,425	86,910
6	3,505	17,525	35,050	52,575	70,100	87,625	105,150
7	4,143	20,715	41,430	62,145	82,860	103,575	124,290
8	4,813	24,065	48,130	72,195	96,260	120,325	144,390
9	5,517	27,585	55,170	82,755	110,340	137,925	165,510
10*	91,321	456,605	913,210	1,369,815	1,826,420	2,283,025	2,739,630
Net present value (25 percent discount)	\$12,333	\$61,665	\$123,331	\$184,996	\$246,661	\$308,327	\$369,992

* Includes gain on sale

terms, and sales levels from other developers, lenders, and real estate professionals. These financial models are readily available in software form for use on personal computers. Menu-driven real estate packages include Realval and Howardsoft. Spreadsheet software that is more flexible and easier to tailor includes Lotus 1-2-3 and Supercalc3.

Setting 4: Structuring the public-private partnership

In this setting we focus on how real estate and financial analysis can be used in structuring a joint venture project. The essential concept of a public-private partnership is that a joint effort is mutually beneficial (see Fisher and Ury 1981). For every incentive the government provides to a developer, a reciprocal benefit must be extended by the developer. Much has been written about the art and science of negotiation, and all of it, whether written by public- or private-sector professionals, stresses the reciprocal nature of the negotiation process. Creative negotiations are not based on zero-sum approaches. Negotiated public-private partnerships seek to enlarge the pie by structuring deals where the total gain of both parties is larger than if they operated independently.

The potential for mutual public and private benefits is the core principle of negotiating public-private partnerships. Other key rules must be followed in negotiating joint development agreements:

- focus on the project, not the developer or city officials;
- focus on the interests of the city and the developer, not on their positions;

- invent options for mutual gains;
- insist on and use objective criteria for structuring the deal.

These rules can be linked with real estate analysis. In order to structure a joint venture, the government must know what kinds of benefits it is looking for from the developer. Possible public benefits include

- dedication of private land to the public;
- enhanced tax base and tax revenues;
- provision or repair of public infrastructure;
- provision of amenities, e.g., art;
- provision of jobs or targeted hiring programs;
- dedication of low-cost housing; and
- project cash flow participation.

The government also must understand the potential benefits to private developers that may result from its actions, such as

- adjustments to zoning and development controls permitting more intensive development;
- assistance in land acquisition and assembly;
- provision of infrastructure;
- expedited development permits and waiver of fees;
- provision of grants and land writedowns;
- provision of tax-exempt financing for portions of the project; and
- provision of manpower training.

The mechanics of deal structuring are complex and must be informed with careful financial analysis. Often the government undervalues what it brings to the

deal. (For a review of how little is known about the benefits of federal initiatives see Glickman 1980.) In the case of the New York Planning Commission, planners undervalued the benefit of density bonuses offered to developers in exchange for urban design amenities (Kayden 1978).

Another example of undervaluation is when the government provides long-term tax-exempt financing. There are several benefits of tax-exempt financing. First, the government-provided financing exposes the developer to much less risk from interest rate variations. Second, in the absence of a tax-exempt loan from the government, the developer may have to share some of his profits with the bank—usually between 5 percent and 15 percent of the remaining net operating income after the mortgage is paid (*National Real Estate Investor* 1984). This form of *participating* mortgage is being used widely by lenders, and it can reduce the developer's rate of return. For example, a project with an annual cash flow of \$100,000, in which a developer had \$500,000 in equity, would produce a 20 percent before-tax return on the developer's equity. If the developer had to share 15 percent of the cash flow with his lender, his before-tax return would drop to 17 percent.

What is the value of this government financing? First, consider the value of a nonparticipating mortgage versus a 15 percent participating one. Assume that a project's cash flow increases 5 percent per year. Using the developer's 20 percent hurdle rate, the present value of the government's nonparticipating loan, for a ten-year holding period, is \$73,692. A developer should be willing to pay up to this amount for the nonparticipating loan. If we expand this example to include the interest rate differential between market and government loans, the difference is much greater. If a project loan is \$5 million and the interest rate differential is 1 percent, the net present value of the difference in loan payments over ten years is \$233,110. Both of these benefits add up to about \$300,000, or about 5 percent of the project value (based on \$500,000 developer equity and a \$5 million loan). There is another big benefit to the government loan that accrues when the developer sells the project: since the tax-exempt financing is assumable, he will be able to pass it on to the next buyer. This financing will increase the selling price of the property substantially, depending on the differential in the existing loans and then-current market rates.

Cities sometimes help developers build large regional shopping centers (Stout and Vitt 1982). In one case a city assisted in the negotiations to assemble land, built infrastructure (a major freeway interchange), and lowered fees. The direct economic benefit to the developer was a reduction in cost of \$10 million. This reduction lowered the developer's front-end costs and reduced

the amount that had to be financed. Assume that 25 percent of this publicly provided benefit goes to reduce the developer's equity requirements and 75 percent goes to reduce long-term debt. What should the developer be willing to trade in exchange for this benefit? The city obviously could ask the developer to provide such things as public art, housing units, recreation facilities, or off-site improvements such as sewerage and water treatment or roadways.

An alternative approach, one that many cities are taking, is to participate in the cash flow of the project. In the above case of the city and the shopping center, the redevelopment agency structured a deal in which it received 10 percent of the cash flow from the operation of the center (revenues from all center sources minus operating expenses) between \$250,000 and \$500,000, and 15 percent of the cash flow over \$500,000. As a negotiation starting point, you should consider the city's contribution to the project on an equal footing with the developer's. If the city's contribution accounts for 10 percent of the required equity, then the city's share of the cash flow should also be 10 percent. The developer may argue that his share should be greater since he is the one doing the project: but keep in mind that if you start to participate in the project, the developer's equity contribution will be less. To negotiate successfully on this point you will need to prepare a financial model of the deal. This model will allow you to firmly establish the financial value of the city's contribution. The model should follow the outline presented in Setting 1.

Conclusions

In the 1980s and 1990s we will have to learn how to achieve more with fewer resources. That means learning how to leverage resources, negotiate better with developers, and focus planning and development controls more sharply to achieve public objectives. Knowledge of real estate and financial analysis is an important part of this learning process. At a minimum, at least one staff member of a planning department should be able to set up a pro forma and conduct sensitivity analyses of projects on a microcomputer. This same person need not be a skilled negotiator, but someone in the department, preferably the director or the head of the current planning section, should understand the principles of negotiation and know enough about real estate analysis to use the concepts presented here. Many of the nation's planning schools, such as those at the University of California at Berkeley, Georgia Tech, MIT, and the Universities of North Carolina, Texas, and Southern California, offer courses in real estate for planners. In another five years real estate analysis will be a standard part of planning education. In addition, a number of professional as-

sociations, including the American Planning Association, the Urban Land Institute, and the Bureau of National Affairs, offer short courses in real estate finance and development. In the meantime, if you want to learn more about real estate, a series of references on real estate and financial analysis follows.

Suggested reading

Three monographs recently published by the Urban Land Institute provide a succinct overview of real estate development and its linkage with planning. These are Stout and Vitt (1982), Witherspoon (1982), and Barnes (1982). Recently APA's Planner's Advisory Service published a guide to analyzing economic feasibility (Roddewig and Shlaes 1984). Real estate, like other professions, has a language of its own. To understand the jargon I suggest Reilly (1977) and Ring and Dasso (1981). On real estate finance I suggest Messner et al. (1979) and Brueggeman and Stone (1981). For information on market feasibility see Barrett and Blair (1982) and Institute of Financial Education (1983). On negotiation see Fisher and Ury (1981).

Notes

1. Much of the material on which this article is based was gained from interviews with planners and developers. In order to elicit their cooperation, it was frequently necessary to guarantee them anonymity. Thus setting 1 and 3 and references to situations discussed in setting 4 are disguised.
2. The process of income capitalization is based on asset-value theory. The process converts the flow of income into a market value. The capitalization process relies on the following formula: Value = Income ÷ Market rate of return. The annual income flow is divided by the market rate of return (a percent) to determine the asset's value. If a bond pays \$100 per year and market conditions are generating 10 percent returns, the price of the bond will be \$1,000. The process for real estate is much more complex because the income flow varies, and the cost of operations and borrowing vary. The capitalization rate attempts to capture all of these factors for valuing the property.
3. There are other approaches that are omitted here because they are not as effective as the one presented. These include fast-tracking and explicit programs to reduce land values.
4. The formula is as follows:

$$A(MP) - A(C + F) - L$$

$$= (A - pA)(MP) + pA(AP) + m(MP) - L - (A + m)(C + F)$$

where A equals the number of dwelling units permitted under the existing zoning, m equals the number of additional market-priced units needed to exactly offset the profit loss from the inclusionary zoning ordinance, p equals the percentage of A that is required to be inclusionary, MP equals the market price of a dwelling unit, AP equals the affordable price of a dwelling unit, L is the land cost, C is the construction and lot preparation cost per unit, and F is the financing cost per unit.

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