

# Fundamentals of Real Estate Development

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by James A. Graaskamp

*The real estate development process involves three major groups— consumer group, a production group, and a public infrastructure group. Each group benefits from cooperation and a full understanding of the values, short- and long-term objectives, and major limitations controlling the other two groups. A major limitation shared by all groups is the fact that each is a cash cycle enterprise which must remain solvent to survive and which must create a surplus over time to maintain credibility with others. Cash cycle enterprises must continually make assumptions about future social norms, technologies, and the direction of complex changes in personal, natural, and political conditions. The degree of error between assumptions and realizations is what is termed risk, and in an enterprise economy most parties are attempting to shift a disproportionate share of the risk to others while retaining a larger share of the benefits. Unlike many mass production industries, each real estate project is unique and the development process is so much a creature of the political process that society has a new opportunity with each major project to negotiate, debate, and reconsider the basic issues of an enterprise economy, i.e., who pays, who benefits, who risks, and who has standing to participate in the decision process. Thus the development process remains a high silhouette topic for an articulate and politically sophisticated society. The best risk management device for the producer group, which is usually the lead group in the initiation of a project, is thorough research so that the development product fits as closely as possible the needs of the tenant or purchaser, the values of the politically active collective consumers, and the land use ethic of the society.*

## Basic Concepts

### Introduction

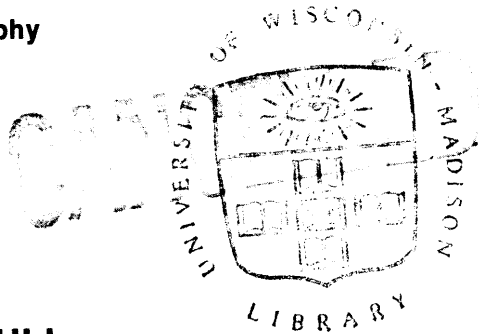
Someone rolled a rock to the entrance of a cave and created an enclosed space for his family—a warmer, more defensible shelter, distinct from the surrounding environment. This can be called the first real estate development. Since then real estate activity has evolved and taken many forms to meet the needs of man and his society. Once based on need and custom, real estate is now based on social economics and statute.

Real estate can be defined generally as space delineated by man, relative to a fixed geography, intended to contain an activity for a specific period of time. To the three dimensions of space (length, width, and height), then, real estate has a fourth dimension—time for possession and benefit. This can be referred to as a *space-time* characteristic. The space-time concept is illustrated by the terms apartment per month, motel rooms per night, square footage per year, and tennis courts per hour. A fundamental element in real estate is that any space-time unit has a corresponding monetary value. While many of the value judgments and debates about real estate projects relate to elusive criteria of what is good and beautiful, in a money economy the ultimate criterion is cash.

The creation and management of space-time units is termed real estate development. Real estate developments range from a simple cave to the complex technology of the Park Avenue skyscraper. Like a manufactured product, a real estate project is part of a larger physical system programmed to achieve long-term objectives, but each real estate project is

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## About ULI

ULI is an independent, nonprofit educational and research organization dedicated to improving the quality of land use planning and development. From its incorporation in 1936, ULI has been interested in resolving the problems surrounding development by establishing, through research, a creditable information base for action and by using the educational process to communicate this information to the various actors in land use development. Based on its experience, ULI strongly believes that research and education, presented objectively, can make a difference and that in most instances reasonable approaches to problem solving will prevail.

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The Urban Land Institute and the U.S. Department of Energy shared in providing a \$1500 grant to Ms. Barbara Gallagher, a graduate student completing a master's degree in Real Estate Appraisal and Investment Analysis at the University of Wisconsin, to assist the author in the preparation of this manuscript.

Although this report was prepared with the support of the U.S. Department of Energy (U.S. DOE Grant No. DE-FG01-80CS 24101), any opinions, findings, conclusions, or recommendations expressed herein are those of the author and do not necessarily reflect the view of DOE.

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also a small business enterprise of its own. Thus, the development process is a continuum of construction technology, financing, marketing skills, administrative controls, and rehabilitation required to operate the real estate enterprise over many years.

Real estate development also is a complex, collective process, not only accommodating an activity within the parcel, but also adapting to the context of a specific surrounding environment, involving different personalities and interest groups, as well as limited resources. The political and social process to produce a real estate product must consider a diversity of impacts to find equitable reconciliation between who pays and who benefits.

### Basic Real Estate Relationships

The real estate process presented in Figure 1 is the constant interaction of three groups—space users (consumers), space producers (those with site specific expertise), and public infrastructures (off-site services and facilities).

The space consumer group includes *individual space users* attempting to rent or buy real estate space to house their specific needs. This group operates individually in the marketplace. The individuals' goals are to survive and to improve their sense of satisfaction and security, using their own funds. In order to achieve the unique combination of attributes each desires, there are trade offs, such as location, space, and operating cost, that must be made and which influence real estate decisions. *Collective users* generally pursue their interests in real estate activity through the political systems that purchase open space, provide for public infrastructures, or regulate space production with pooled funds from taxes, bonding, etc. *Future users* are typically represented by proxy, either by developers who anticipate the need to change the use of a building in the future or by the judiciary or special interest groups, who perceive some trusteeship of the land for future generations. Provision for future users is a hidden charge to present consumers.

The space production group includes all forms of expertise necessary to convert from space-time requirements to money-time. The system includes those who assemble the capital and those who prepare materials as well as those who contribute to the assembly of these on site. Architect and

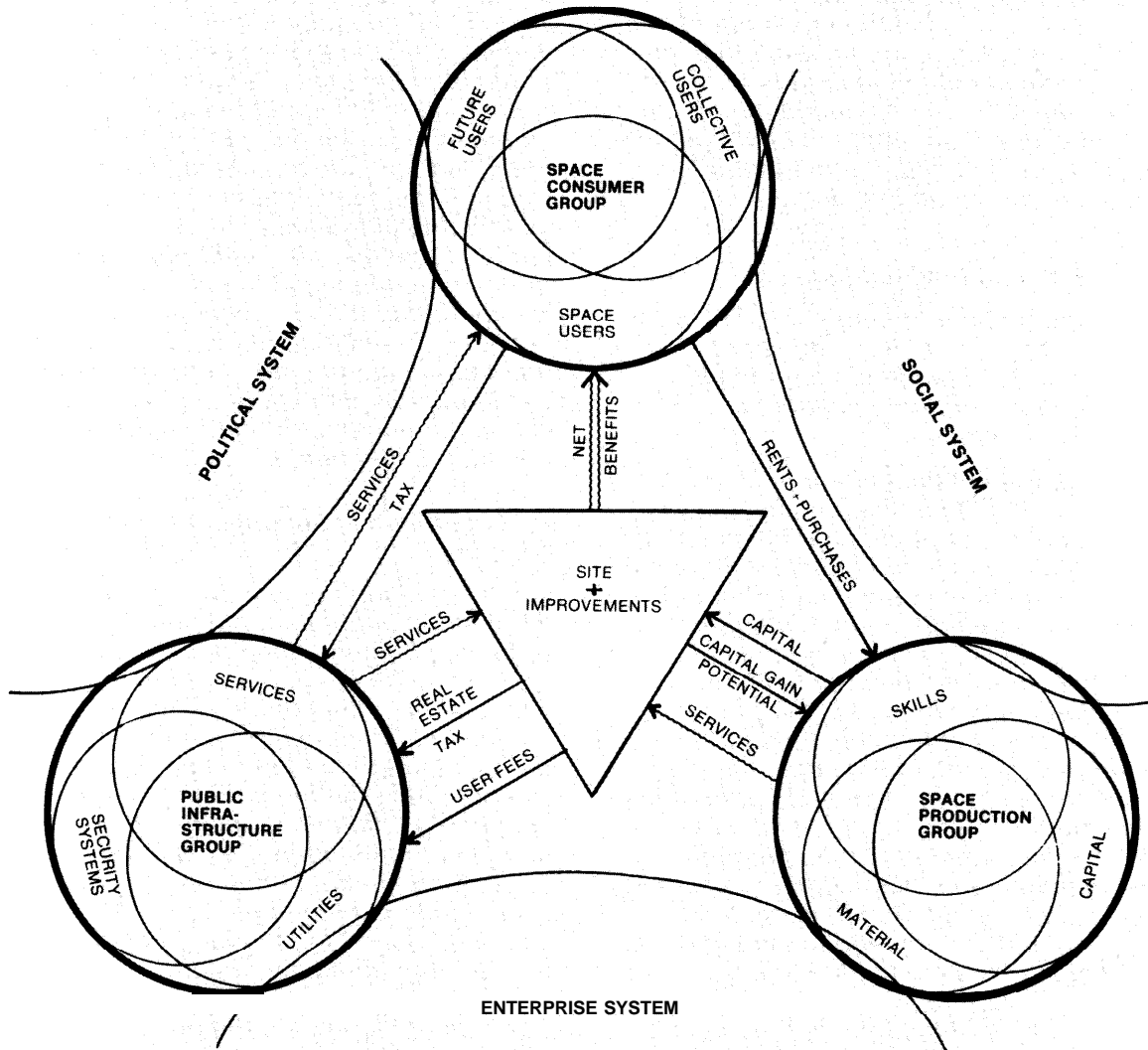
mortgage banker, lumberman and lawyer, city planner and hotel manager are all in the real estate business. The real estate business includes any person with expertise in creating and maintaining spaces to house activities of space users in the marketplace.

The public infrastructure group includes all those enterprises that provide a network of tangible and intangible off-site systems for the individual space user, including physical networks of street and sewer and other utilities, services like education, police and fire, and operational systems for deed registration, governmental regulation, adjudication, and all forms of economic activity with efficiencies of scale that suggest collective off-site action. Note that the difference between space production and public infrastructure has nothing to do with private or public ownership since private companies may provide utilities and public agencies may develop real estate. A necessary service, like sewer and water, schools and libraries, becomes an element of infrastructure when there are economies of scale to be enjoyed through collective action of many parcels, leading to off-site centralization.

### Cash Solvency—The Critical Common Concern

Each of these three functional groups, and any subgroup therein, represents an organized, rational undertaking, called an enterprise in the language of systems (see Beckett). In an industrial society each enterprise is a cash cycle operation. Each begins with certain cash resources with which to purchase raw materials and services, to add value through expertise, and to exchange finished inventory for accounts receivable and back to cash. Most such enterprises, be it a hospital, a city, a household, a university, or a single student, are not attempting to make a profit, but each and every enterprise is constrained by the need to maintain cash solvency, both in the short and the long term, or become bankrupt. Cash solvency of each enterprise in the total process, not maximization of value, is the pivotal issue of survival and the one measure of self-interest that all these conflicting entities have in common. Only a few enterprises are intended to be profit-oriented. Cities, school districts, and home

**Figure 1**  
**The Real Estate Process**



builders are all cash cycle enterprises. Of course, *solvency plus a surplus* at the end of a year can mean the city manager, the hospital director, and the home builder will enjoy praise, trust, and greater latitude to try new things from their city council, hospital board, or bank loan committee. Cash solvency is a continuing test of management, and cash surplus the measure of survival risk.

Therefore, a basic axiom for determining real estate actions is that a desirable real estate program permits maximum satisfaction of the consumer within an affordable structure, while respecting environmental limits of the natural resources and permitting the public infrastructure and space production groups to achieve cash solvency, termed a cash break-even or default point in financial planning. Several important implications of this view of the real estate process are:

- The true profit centers in the real estate development process are in cash revenues created by the developers' expertise in producing space-time units.
- Equity ownership is the degree to which any one enterprise can control or divert cash flows from a real estate project to compensate for its contribution of land, materials, money, and/or expertise.
- Since the public has constitutional rights to divert cash productivity of the property via the real estate tax and user fees, the public has direct ownership of every taxable parcel to some degree, is a preferred partner in the ownership structure, and possesses real assets in terms of taxes, net service costs, and user fees (see Care).
- Site selection represents a consensus of cash cycle forces, with the cost of site preparation acceptable within solvency limits, which are determined by rent levels, real estate taxes, and an infinite number of factors reflecting the economic characteristics of the user, the producer, and the cost of infrastructure services at alternative sites.
- Control of land through ownership, option, or alliance can indicate who in a real estate project will be hired, what materials will be purchased, and where all the cash flows generated by development and management can be directed. That is why architects, mortgage bankers, public authorities, and cities become developers—to capture some small percentage of the cash flow benefits to their enterprises.

## Land Versus Location

Land is not location, property rights, or the most important aspect of a project site; instead, land is a natural resource upon which real estate decisions come to bear. It is that which can be brought under the control of man to bear his structures. It is a finite resource that can be exhausted by extractive industries, destroyed by seismic and ocean upheaval, or wasted by ignorance of its processes. It is a limiting factor in development and both a reference and a bearing point for space-time units.

The physical land attributes with legal-political constraints, linkage attributes that define location, dynamic attributes that exist in the eye of the beholder (such as prestige, anxiety, and claustrophobia), and attributes of a larger environmental system create a site.

Location is often identified as the critical factor in a site, but it is seldom understood that location value is related to the functional needs of the activity and not the site. The family unit is a common example of multiple functions involving employment, school, shopping, and recreation. The family chooses a home site that balances convenience against the cost of inconvenience. Each relationship between a household and another point requires movement of persons, goods, or messages. This is termed a *linkage*, and the time, stress, and dollar costs involved are referred to as the costs *of friction*. Each establishment seeks a location defined as a set *of linkages* that will minimize these costs. As the costs of energy, congestion, and time have risen for commuters and the need for suburban school linkages has diminished, the opportunity for reducing costs of friction by trading the house in the suburbs for a condominium downtown has been transferred into rent or the price of a condominium. Rent differentials for location reflect market recognition of perceived costs of friction to desired amenities. Therefore, locational value is in the mind of the space user rather than inherent in the land, and demand pressures on land shift as his perceptions of convenience shift. Of course, movements of goods and services and people often employ networks of pipes, paving, and wires directly to the site so that some linkages become physically set due to economies of scale in reducing the costs of friction. Some communities have expanded the web of physical linkages to include pneumatic-tube garbage collection, centralized heating and cooling, cable TV, skyway systems, and pedestrian tunnels. However, most linkage relationships are subtle,

**Figure 2**  
**Industrial Site Alternatives**

	<u>Site A</u> Northern City	<u>Site B</u> Southern Town
<u>Revenues:</u>		
Unit Sales	11,000	10,000
x Price/Unit	<u>\$ 110</u>	<u>\$ 110</u>
= Dollar Sales	\$1,210,000	\$1,100,000
<u>- Expenses:</u>		
Raw Materials	\$ 110,000	\$ 100,000
Transportation: Raw Materials	11,000	5,000
Finished Goods	55,000	110,000
Labor: Productive Labor Hours/Unit	10.0	10.0
+ Productive Hours as Per cent of Clock Time	0.8	0.95
= Total Hours on Wage Bill	12.5	10.5
Direct Labor Cost/Unit/Hr	<u>\$ 4.00</u>	<u>\$ 4.00</u>
+ Indirect Labor Cost/Unit/Hr	<u>\$ 1.00</u>	<u>\$ 0.50</u>
x = Total Labor Cost/Unit/Hour	<u>\$ 5.00</u>	<u>\$ 4.50</u>
= Total Labor Cost/Unit	\$62.50	\$47.25
Total Labor Costs	687,500	472,500
Administrative Salaries	90,000	150,000
Real Estate Taxes	60,000	20,000
Utilities: Heat, Light, Power	<u>75,000</u>	<u>60,000</u>
Total Expenses:	1,088,500	917,500
= Net Profit Before Taxes:	\$ 121,500	\$ 182,500
<u>Capital Costs:</u>		
Land	50,000	20,000
Building and Machinery	400,000	250,000
Cost of Relocation	<u>0</u>	<u>100,000</u>
Net Capital Employed:	\$ 450,000	\$ 370,000
<u>Rate of Return on Capital:</u>	0.27	0.49
<u>Number of Years for Payback of Relocation Cost:</u>	$\frac{450,000-370,000}{182,500-121,500} = \frac{80,000}{61,000} = 1.3 \text{ years}$	

systematic, behavioral patterns that require a thorough understanding of particular establishments and are the basis for marketing.

#### Linkages, Location, and Cash Cycles

Location as an attribute of the establishment rather than a physical site can be understood by a look at simple financial plans of hypothetical industrial, re-

tail, and household establishments. In Figure 2 the relative revenues and expenses of two alternative plant locations are presented. Notice that the linkages in each community to customers provide different sales estimates, while expenses are also altered by the proximity of each site to raw materials, distribution points, and the availability of labor pools with different expectations of hourly wages,

**Figure 3  
Retail Store Cash Cycle**

<b>I. Determination of Optimum Store Rent:</b>	
Number of families in area	5,000
x the store's capture rate	.20
= Number of families visiting the store	1,000
x Average family income in area	\$20,000
x % of family income spent in supermarkets	.12
= Total potential sales for the store	\$24,000,000
x Leakage of food purchases to other sources	.50
= Expected potential sales for the store	\$12,000,000
÷ Sales/(sq. ft. of sales floor area)/year	\$400
= Sq. ft. optimum building size	30,000
Expected potential sales for the store	\$12,000,000
x % of sales allocated to rent expense	.075
= Net rent allowed per year	\$90,000
÷ Optimum building size	30,000
= Optimum net rent/sq. ft.	\$3.00
<b>II. Determination of Optimum Building Cost:</b>	
Parking stalls required/300 sq. ft. GLA	1
100 stalls x 300 sq. ft. each	30,000
+ Gross building coverage	34,000
= Minimum site area	64,000
x Price of land/sq. ft. of \$2.00 (approx. \$86,000/acre)	\$128,000
x 10% interest on land	12,800
= Annual budget for improvements	77,200
÷ Capitalization rate of 11.5%	.115
= Total budget for building and site	671,300
÷ 34,000 gross feet	\$19.75/sq. ft.*

\*This budget is too low for 1980 building costs; developer must reduce size of store and cost of site or capture more of potential market of grocery sales.

vacation time, and benefits. Indeed, benefit costs may be lower because the average age of the population in site B is much younger than in site A, reducing hospital costs, pension costs, and the prerogatives of long-time seniority. On the other hand, administrative salaries are higher in order to compensate executives for doing without certain amenities not available in a small town, such as a country club, a parish school, or diverse medical services. Real estate taxes may be minimal because government services are much less comprehensive

and fire insurance may be higher due to a remote fire station. Utilities may be lower because of linkages to hydroelectric power rather than coal-fired plants for site A. Even the capital costs are modified by the intensity of nearby land development and the willingness of state governments to subsidize the costs of relocation. All these factors are linkages for an industrial establishment which alters its cash flow, business and financial risks, and profitability. In theory it could pay more for site B because of the increment in the efficiency of its operations.

The retail store location example in Figure 3 depends on its linkages to families in the trade area which have both the income and inclination to visit a particular store or supermarket. The relationship of the store to other nearby retail establishments may generate traffic volume and attract customers or may intercept customers from the potential trade area. A potential linkage to a flow of passing customers can be subtly strengthened by a stop light or a right hand turn lane or devastated by a median strip which cuts off the linkage of a particular store site to traffic lanes going by. A great number of linkage relationships will affect potential sales for the store and that in turn controls the acceptable rent levels, capital budgets, and store sites in the real estate process. Notice that any particular retail store can pay a premium for a site where the linkages are expected to produce more than average penetration into a potential consumer group passing by or living in the vicinity. Some retail establishments need multi-state linkages by interstate or airline, such as Disney World or ski resorts in Colorado. In Vancouver a development company owned the north shore of Howe Sound but the only linkage was a ferry boat, so the property was relatively worthless despite its views and southern exposure. A suspension bridge two-thirds the size of the Golden Gate was built, and Lion's Gate Bridge became the critical linkage to create land of immense value for homes and business.

Many of the most subtle linkages are involved in selecting a housing unit for the family household. Linkages of the home site in terms of density per acre and a prestigious location must be traded off with neighborhoods which have homes of different sizes and quality in order to arrive at a monthly housing cost which is acceptable within cash limits of the household. The family is tempted to strain the cash budget because the house purchase is perceived as a major investment opportunity that may provide significant capital appreciation. This capital

gain is thought to reduce their net housing cost below that of rental alternatives in the long term. Combine net housing costs with costs of transportation to work, play, and shopping, and with possible costs of poor schools or exposure to natural disaster, and the choice of a house becomes a problem.

### **Cash Cycle of the User Versus Cash Cycle of the Collective Consumer**

Public decision groups, like city councils, school boards, and county governments, often fail to recognize the relationship between the cost of their decisions and the true cost of land since the land cost is out of one pocketbook while the costs of friction are shifted to others who may not vote in their district. Consider the community college district which purchases a cheap rural site rather than assembling a more expensive urban campus because the five rural counties in the district can out-vote the single urban center county. While capital cost to the community college funds are reduced, there is a significant increase in the total ongoing cost to students who must commute long distances to school and part-time jobs, to the urban community in terms of underutilized residential land, and to retail real estate near the abandoned old campus.

More recently, with population pressures, depletion, and occasional misuse in the past, natural resources are becoming scarcer. Mindful of this, Congress passed the National Environmental Policy Act in 1969. Its purpose was to prevent or minimize damage to the environment by new industrial and residential development for the benefit of all present and future consumers. To implement this act, most state and local governments now require an Environmental Impact Statement (EIS) for all proposed large developments. A carefully researched EIS may sometimes be of help to both the developer and the city planner by pinpointing major problem areas and suggesting alternative courses of action. An inadequately researched statement can waste everyone's time and money, either during the planning stage or later during the project's use. Generally a shorter environmental impact evaluation of critical issues is the most cost effective.

Recently, many planning departments and conservationists have used the EIS and other provisions of the 1969 Act to thwart growth in their cities and towns, which was not the original intent of the Act (see Frieden). MIT professor, Bernard Frieden, in his book, *The Environments/ Protection /-lust/e*, warns that a new "exclusionism" is surfacing across the country. Where the old exclusionism attempted to exclude only low-cost housing in an effort to keep out minorities and the poor, this new exclusionism attempts to keep out everyone-rich, poor, and middle-class alike. This restriction on growth, especially in the suburbs and in-fill areas of the cities, Frieden claims, results in higher prices for housing, reduced choice of housing location, and longer commuting distances, and it discourages carefully planned developments by the large developers. In the same vein, political use of infrastructure systems has become an oblique and debatable extension of land use control law for exclusionary purposes.

The collective consumers are moralistic in public statements but are generally motivated to enhance their own cash positions. For example, in a city south of San Francisco, Palo Alto, further residential growth would require present homeowners to share the subsidy of residential services from the industrial tax base with new residents. Thus they voted to commit 7,000 acres of development land to open space, estates, and some new industrial parks in the name of environmental quality. The monopoly created by growth management causes home prices to skyrocket to the advantage of existing residents, while exclusionary zoning may make it unnecessary to finance expansion of sewer and water facilities by raising everyone's water service fees. Those who benefit as existing residents control local votes and those who must ultimately pay monopoly prices have no standing to vote. Thus the collective consumer will operate to block or imbalance development to protect his short-term cash interest; by the same token, the collective consumer as a builder of public facilities often thinks of only its own budget and not of the shift of hidden costs to consumers and taxpayers.



## The Cash Cycle of Infrastructure

Every real estate development creates a new customer for the public infrastructure which surrounds the development site. Each home constructed creates a new customer for the water service, the school system, and the fire department, and generates revenue in the form of meter charges for utilities, real estate taxes, and other receipts such as a share of gasoline taxes for street maintenance and state aid for education based on a per student formula. There are secondary revenues, albeit indirect, in terms of increased retail sales levels, commercial land values and assessments, and, therefore, real estate taxes on ancillary uses. There is no aspect of cash forecasting more difficult than fiscal planning for the impact on revenues and service expenses of alternative land use plans, but much has been learned in recent years about the techniques of forecasting cash cycle implications of alternative development (see Vollman). In the past there was a tendency to oversimplify revenue/cost implications with broad generalizations: mobile home parks presumably had low assessed value but high educational cost burdens and high service cost implications for welfare and security; everybody knew that industrial plants produced far more tax revenue than required for service costs since there were no children to educate or streets to plow in winter. On the other hand, industrial plants attracted the workers at wage scales which could only finance mobile home housing and contributed to highway congestion which led to street widening programs. The combination of new residents and new jobs was the final burden on the sewer and water systems which required expanding the processing plant and well system to anticipate growth for the next 10 years. How does one allocate the current costs for expanding the water system and the street capacity between residential and industrial users and further subdivide the burden between present users and future users still to come? Fiscal zoning of land use mix within a community requires open-minded flexibility to balance cash revenues and cash expenses with mixed-use land planning concepts and multiple development proposals spanning different development time frames (see Burchell and Listokin). A new industrial plant may create a tax surplus which will be consumed in providing services for new residents hoping to work at the plant. But these new residents in turn will prompt commercial de-

velopment which will further expand the tax base and may restore some real estate tax surplus 5 to 7 years after construction of the first new plant. The interplay over time between cash cycles of users, collective users, and the infrastructure system is the base for the interface between economics and property rights.

## The Concept of Property Rights

Individual and collective use of space-time resources and land has always been regulated by society, in part through law and in the larger part through political administration of the laws so that it is always necessary to speak of the legal-political attributes of a site. The rights to use or abuse, to provide expertise or choose contractors, the rights to prohibit or to condition use in certain ways, or to transfer rights from one person to another are defined as property rights. Society creates and continually modifies the allocation of property rights among private ownership, public institutional ownership, and common ownership indivisible among all members of society. A primary function of property rights is to provide incentives for specific parties to take responsibility for development as well as conservation of the resource. The market system rewards those, in terms of consumer satisfaction, who produce the best buildings for the lowest cost of construction and operation.

Until the early 1700s in England, each community had common lands available for everyone to graze their livestock. No one had a vested interest in maintaining some grass for tomorrow or the right to exclude animals to permit regeneration of the grasses, and the resource was crushed by overgrazing. The commons were abruptly fenced to permit controlled grazing by the rich, to the great discomfort of the poor.

Similarly, better information about economic and environmental cause and effect leads to more sensitive, refined allocation of rights. Property rights

attempt to incorporate responsibility and its corresponding cost with land use decisions that are fairer to all members of a society. Therefore, cash flow revenues and outlays provide one way to measure the relative burden on interacting parties and to refine allocations of rights and responsibilities, that is, benefits and costs.

Information techniques, property rights, and economics continually interact. The supply and demand for rights to be bought, sold, leased, or otherwise exchanged depends on the benefit and cost of those rights to someone at a certain point in time and the scope of those rights as defined by law. The ownership of a car becomes less attractive as a commodity when the increasing gasoline prices, transportation taxes, insurance costs for injury caused by the auto, and emission control costs are included. Society may further restrict the hours, speed, purpose, or locations for which an auto may be used—the scope of property rights in an auto. Dramatic changes in gasoline prices produce rapid price reduction in large, gas-hogging automobiles. As long as the interaction of law and economics is gradual, almost unnoticed, there is some degree of certainty about future assumptions. Should rights-to-use change abruptly, the interface between the law and economics is marked by fissure, failures, and disturbances not unlike those caused by faults in the earth's crust itself, and new social problems appear. Big cars are expected to depreciate in a few years under the best assumptions, and the owners can minimize the losses by paying more for gasoline, reducing their mileage, and postponing sale for a few years. But the large capital investments in land development, buildings, machinery, or ships are depreciated instantly when laws like downzoning, rent control, pollution controls, or territorial fishing limits change their anticipated income sources or costs of operation. Unlike the car ownership which involves a 3- to 7-year cash cycle, larger capital enterprises with major debt structures anticipate useful lives of 25 years or more; with an intensive fixed cost of operation they are quickly rendered insolvent by unexpected changes in the legal environment. Such allocations generally involve conflict between equally valid points of view and rights of survival and may transfer great wealth in the form of capitalized cash flows from landlord to tenant or collective consumer.

Although the language of real estate seems static, it is not. Many terms used today, such as fee simple ownership, had their origins in medieval England. Their current meanings, however, are quite different from their medieval definition. Property rights do change and exist in a certain form only as long as society achieves its objectives in terms of encouraging development and husbandry. Nevertheless, change in property rights must be implemented at a rate which each enterprise can tolerate in terms of its cash cycle and the threshold of insolvency or there could be a taking of property without due process.

### Most Fitting and Most Probable Use

Until recently the economic theory of real estate decision making was built on the premise that the system was committed to finding that private use of a parcel of land that would maximize the owner's wealth by being the most profitable use of the site linkages or physical land. Presumably, the only criterion was profit, hence the cryptic term "highest," and as an inheritance from Adam Smith, there was the further presumption that maximum profit was "best" for society. Actually, the allocation of land to those who would pay the most or develop it most intensively was characteristic of nineteenth century America, when society needed to reward those who would modify the frontier to accommodate a rush of immigrants. At the same time, society had not melded to a point where it could find a consensus on land use priorities and social objectives. However, it was only as recently as 1975 that the fundamental economic premise of "highest and best use" was redefined as that use on a given date that could be selected as most profitable from reasonable and probable alternatives that were physically possible, legally permissible, and financially viable, given a specific level of effective demand and costs of production (Boyce, pp. 107-108). The official definition further made it explicit that wealth maximization was to be qualified by recognition of how a specific use would contribute to community environment and community development goals. Thus, it has been recognized that the development of each parcel must be considered within a larger system and pattern of land uses and the frequent use of the words "reasonable and probable" reveals a recognition of many of the uncertainties that attend assumptions required in the decision to use and develop a parcel. At best, however, the term "highest

and best use” is an anachronism from laissez-faire attitudes of the nineteenth century that have undergone an evolution in meaning like the concept of fee simple title. At worst, it implies certainty of one man’s judgment, a one-dimensional measure of the adequacy of a development concept and cash for the landowner even when it is apparent that there are many vested interests in the cash flows that are affected by a given land use decision. Therefore, it is useful to replace this terminology with the terminology of most fitting use and of most probable use.

Any decision process requires identification of alternative courses of action and their consequences, and the consequences must then be evaluated and ranked in terms of their acceptability and probability to choose the appropriate plan of action. Typically, a set of consequences is compared to some set of standards which defines the acceptable, the undesirable, and the unthinkable. These standards can be somewhat altruistic, or what might be defined as the norms to which a society is striving. The concept of most *fitting use* is normative, that is, the optimal reconciliation of affected consumer demands, the cost of production, the cost of infrastructure services, and the fiscal and environmental impact on third parties. Reconciliation involves financial impact analysis of who pays and who benefits in cash terms as well as compatibility analysis of the collective consumer’s perception of environmental quality and impact on the good life—elusive standards at best. The concept of most fitting use assumes the goals and limitations have been well defined and that misfits between proposed solution and standards can be recognized.

Experience tells us that most plans, development or otherwise, fall short of the ideal. This tendency is replied by the concept of *most probable use*. Most probable use is that alternative course of action which is closest to being the most fitting use while recognizing strong constraints imposed by current political factors, real estate technology, the personalities and talents responsible, the money market, and short-term solvency pressures on consumer, producer, and public infrastructure.

Any enterprise is a compromise because the form it takes, in terms of both its configuration and its behavior, reflects a negotiated consensus between two general sources of power—the power of its environment to dictate form and the power of the organization itself to decide what its characteristics and behavior will be (see Beckett). In the process of development the elements of law, public infrastructure, and consumer preference are the external forces affecting behavior, and the ability to respond from within the organization is a function of talent, money, and political skills.

## Risk Management in Development

### Conditions of Uncertainty in Development

All parties in the development process must accept significant levels of uncertainty about their cash budgets and other expectations as each enters the development process with a set of assumptions about the future in a society that has been changing at an accelerating rate. The amount of uncertainty for an enterprise varies according to its needs and income. The homebuyer expects to have the same job and the same family needs and disposable income for at least several years, but must organize family finances through insurance and savings to anticipate unemployment, illness, and even death. The pushcart vendor can change his location, his prices, his product mix of flowers and bouquets almost hourly and clean out his inventory by evening. Should he be unsatisfied with his business, he can convert from flowers to scrap collection or popcorn sales the very next day, unless frustrated by municipal permits. The retailer needs 6 months to reform his inventory to changing consumer tastes, and the manufacturer needs 5 years to research and develop a new product line or relocate his plant. But the real estate developer is locked into a specific location with an immovable inventory of room nights, apartment months, or square feet of leasable area that must be priced and sold many times, for as long as 25 years, before the total capital investment is recovered. That is a unique risk management assignment, and the developer who succeeds most often is the one who takes most care to validate the assumptions over which he has some control and to cushion the enterprise with tolerance for surprise and those changing conditions over which there is little control. The real estate process

is concerned with identifying the explicit and implicit assumptions on which each consumer group, each infrastructure, and each production element of expertise is operating in order to allocate risks among those who benefit and those who pay each development alternative.

Control of this variance is called risk management. There is a continual refining of assumptions to convert as much speculation to fact as is possible and to provide tolerance for the uncontrollable surprises. Risk management is not only a philosophy of inquiry and problem solving, but also a primary objective of market research, of contract negotiation, and of strategic positioning of any enterprise or investment selection pattern.

### Basic Risk Management Techniques

Aside from the outright avoidance or acceptance of the unknown, the business risk situation can be improved through application of one of the following techniques:

1. Improving forecasts through statistical research of the critical facts. For example, the reliability of a forecast is improved by increasing the sample size (the standard error of the estimate is reduced by the square root of the expansion in the sample size). While not all real estate research is statistical research, nevertheless, the general principle is that the exposure to surprise can be reduced by knowing more about the problem in a systematic fashion. Survey research of the consumer, soil testing, and quality control of materials are all elements of risk reduction through research and information processing.
2. Combining risks by pooling resources, by diversifying investments, and by improving forecasting through scale of operations. A 4-unit apartment with a single vacancy has lost 25 percent of its income while a 100-unit building with 10 vacancies has a 10 percent vacancy loss to gross income, a far more stable situation.
3. Shifting risks by insurance contract, accepting the small certain loss of an insurance premium rather than the unpredictable loss of unknown frequency and severity of some insurable catastrophe like fire, collapse, death, or disability. Most static risks, contingencies which are sudden, external, random, and unpredictable as to time, are insurable.
4. Shifting the risk by two-party contract. The escalator clause in leases is a classic example of shifting the variance in rising operating expenses or real estate taxes to the tenant; the construction contract shifts some of the risk of rising material and labor prices to the general contractor, but in recent years there has been hard bargaining so that developer and contractor each share a part of the risk. Careful study of development ventures between private and public agencies will show that the majority of the contract is allocating responsibility for political administration or construction according to the expertise of each. For the dynamic risks of management, the best controls are the pains of penalties for the failure to perform and the profits that go with expertise in the execution of a plan.
5. Limiting liability for losses through the form of ownership as a corporation or limited partnership or exculpatory clauses (which says the lender can only take the property in case of foreclosure) with which one party releases a second from an obligation to perform or for damages as a result of failure to perform.
6. Hedging is a term which covers a wide variety of devices for protecting oneself against future price fluctuations or other future contingencies. For example, a buyer can make an offer to purchase, contingent on future realization of political approvals, financing, or other requirements. An option to buy, an option to repurchase, or a variable interest rate mortgage are forms of hedges. The classic hedge in real estate is a mortgage loan for nearly 100 percent of the development cost without personal endorsements. If the project succeeds, the borrower can call out the equity profits by selling the property and paying the loan from the proceeds. On the other hand, should cash flows and appreciation prove inadequate, the borrower can default on the mortgage and *give up* the property to the lender through foreclosure or voluntary conveyance of deed in lieu of foreclosure. Business censure for mortgage default, while still damaging to the developer, has weakened significantly in recent years.

Not only do the parties to the development process seek to arrange the best possible solution to their problems, but also they must anticipate the many less favorable alternative outcomes to a given set of assumptions in order to survive an upset of their plans.

### Time as a Critical Risk Element

The passing of time is the most critical risk in the development process. Time permits the power of compound interest to erode the developer's resources, and it allows the conditions of competition and consumer needs which were true when the project started to change significantly. Perhaps it is the impact of compound interest which is least understood by most government regulators and most often used for extortion by those few who do understand it. Remember that a project with \$1,000,000 invested at a nominal construction interest rate as low as 12 percent per annum is costing \$10,000 interest for the first month, \$333 a day, and then \$11,200 the second month, etc. If the developer had hoped for a net profit of \$50,000, a total delay of 4 months in completing the project will not only cause the loss of that profit in additional interest charges, but also may give the tenant the right to break his lease, the owner the right to invoke a loss of use penalty, the mortgage lender the right to renegotiate more expensive terms than those in the original commitment, and a competitor the opportunity to finish first and capture the market.

As money and time are expended on the project, time becomes of the essence in achieving expected revenues from sales and rentals. Thus, it is not uncommon to see tall buildings where the top floors are still being structured while the bottom floors are already receiving tenants. In a slow office market it may be cheaper to build three 100,000-square-foot buildings, one after the other, rather than a single large 300,000-square-foot building where the economies of scale can be quickly lost to the cost of carrying a vacant inventory of space for even a relatively few number of months or years. The cost of carrying a vacant inventory of space can sometimes be controlled and often significantly reduced by an investment in market and merchandising research. It is a customer and the rate at which customers absorb space that drives the cash cycle development process. A careful study of each market segment for demographic characteristics, the needs and motivation of the consumer, his priorities in terms of a finished product, and the price he would be willing to pay is merchandising research. American developers have tended to neglect marketing research in risk management in favor of faster construction methods and more elaborate contract al-

locations of risk among money partners and government agencies. Nevertheless, cash from rapid occupancy or sales turnover of inventory as a result of careful research is the best method for reducing the relentless pressure of compound interest.

### Preliminary Budget Concerns—Producer Group

#### Feasibility Analysis

Feasibility analysis is a generic term which groups a variety of predevelopment studies by generalists and specialists in a systematic philosophy of inquiry to determine facts that are reliable, assumptions about the future that are consistent with past experience, and tactics which will minimize the variance between objectives and realizations (see Graaskamp; also see Messner, Boyce, Trimble, and Ward). A real estate consultant would categorize various report types as suggested in Figure 4. A developer builds only what he can finance, and lenders should finance only those projects for which there is a defined consumer group representing effective demand in a specified period of time. Seldom can one individual or firm deal with all of the feasibility topics and report types equally well due to the necessity of specialization, the bias of a single viewpoint, and the gaps in professional education.

The sequencing of analysis depends on the problem, and ultimately there are only three types of real estate feasibility problems:

1. The search for the most fitting site for a use(s). (Figure 5)
2. The search for the most fitting use(s) for a specific site. (Figure 6)
3. The search for the most suitable investment by investors. (Figure 7)

The most common situation is the site in search of a program for use by the speculative developer. The

**Figure 4**  
**Report Type Categories within**  
**General Category of Feasibility Analysis\***

**Strategy study:** selection of objectives, tactics, and decision criteria.

**Market study:** economic base studies or other related aggregate data review.

**Merchandising studies:** consumer surveys, competitive property analysis, marketability evaluation, etc.

**Legal studies:** opinion on potential legal constraints, model contracts or forms of organization, and political briefs.

**Physical design studies:** engineering, land planning, and architectural studies.

**Comparability studies:** impact analysis of project on community planning, environmental quality, fiscal solvency, or other public policies.

**Financial studies:** economic modeling, capital budgets, present value and discounted cash flow forecasts, rate of return analysis, financial packages.

● Modified from work of J. A. Graaskamp, *Guide to Feasibility Analysis*, Third Edition. (Chicago: Society of Real Estate Appraisers, 19s0).

use in search of a site, such as the occupant seeking new housing for his activities, is generally in a more flexible position of first specifying a program and then searching for the most fitting site. The development process is most successful when the developer first researches a program in terms of a marketing target and investment criteria and then acquires land most likely to advance that program.

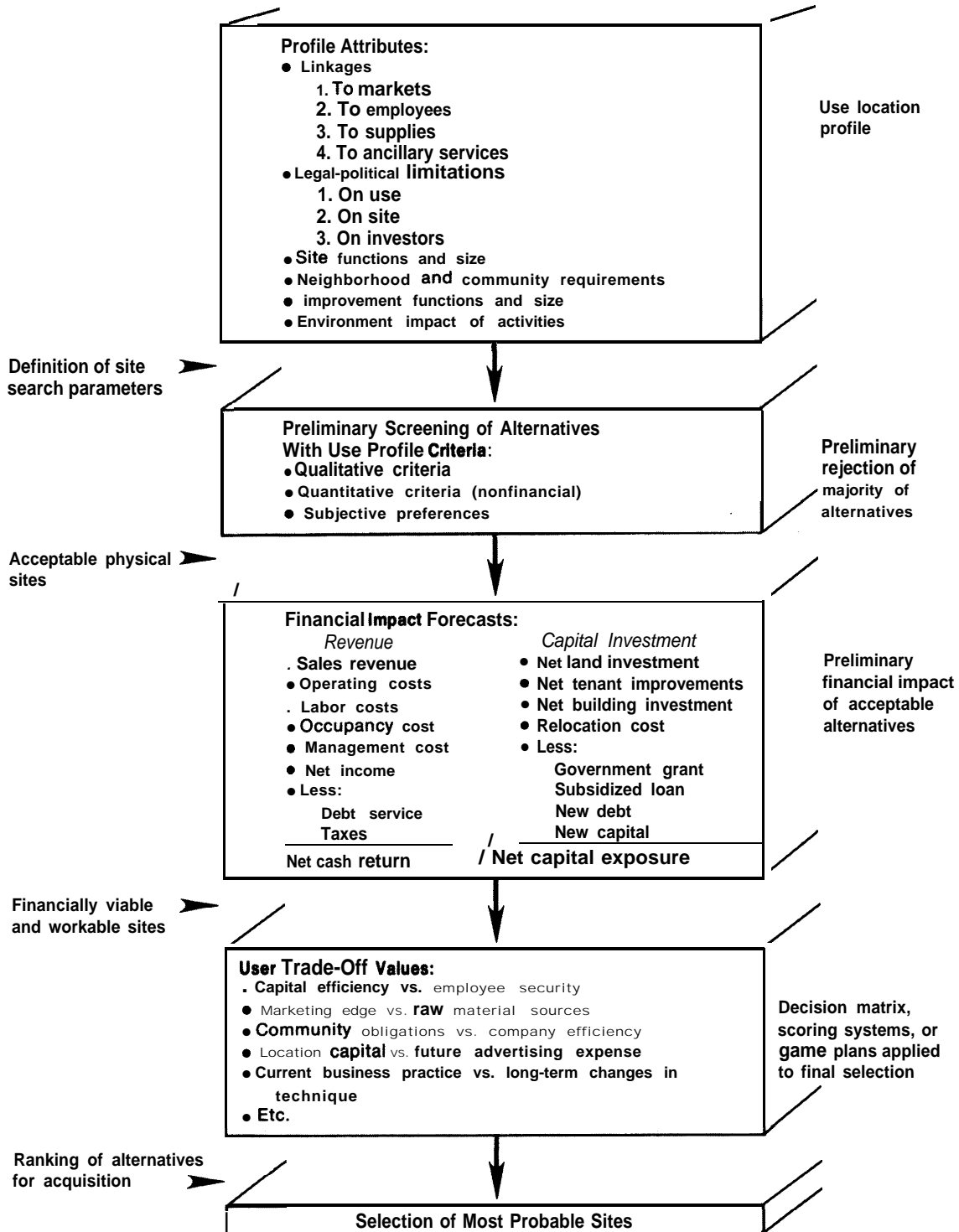
**Approaches to Determining Feasibility**

The revenues of a development come from either rental income or sale of space-time unit, and the

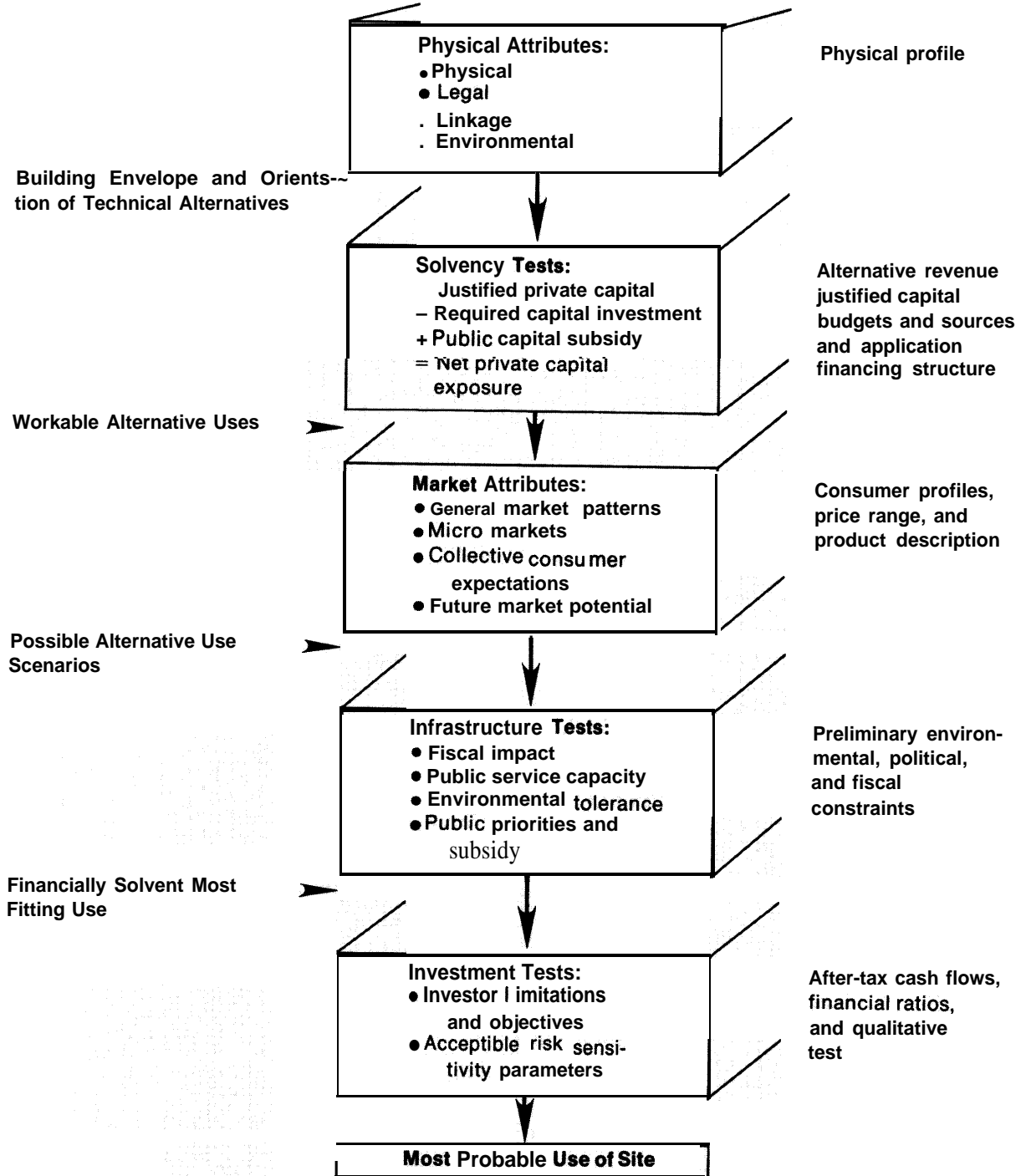
real estate development intended for rental purposes provides the clearest and simplest demonstration of how a space-time unit and a corresponding monetary value are irrevocably linked together. If the total capital budget has been set by a completed architectural program, it is then possible to determine the rent required per unit—a “front door” approach; more realistically, the developer should determine the market rents and additional supply of space required in a given sector and then work backwards to establish the capital budget justified by revenues and control of the design. Too often the design specifications are set so that the rents required to justify the project are out of reach of prospects in the marketplace.

Consider the example in Figure 8 involving a small, two-story suburban office building on an 80,000-square-foot site, costing \$100,000. With 16,000 square feet per floor, it provides 20 percent ground cover and very adequate landscaped surface parking. Assuming a basic construction cost at an economical \$30/square foot with fees, construction interest (\$100,000), and indirect costs (legal and design fees, permits, etc.) of \$180,000, the total capital budget is expected to be \$1,240,000. It is hoped that lenders would provide 80 percent of the required funds for permanent financing (or \$992,000) on a 20-year term, 11½ percent annual interest, monthly payment mortgage, which means total interest and principal payments annually will be \$127.97 for each \$1,000 borrowed, resulting in a debt service constant of .127968. Therefore, the project must generate cash of \$126,944 a year for the mortgage lender. The balance of the money required, at least \$248,000 of it, assuming no working capital and no cost overruns, would be provided by a partnership of equity investors. They require only a 6 percent cash dividend on their investment each year since they expect additional return from gradual amortization of the mortgage and appreciation in the resale price over the next 10 years. Experience has shown that operating expenses for this multi-tenant building will approximate \$2.50 per square foot of gross area while real estate taxes are running about \$1 a square foot for comparable properties in the

**Figure 5**  
**Analysis Process: The Search For a Site For a Use(s)**

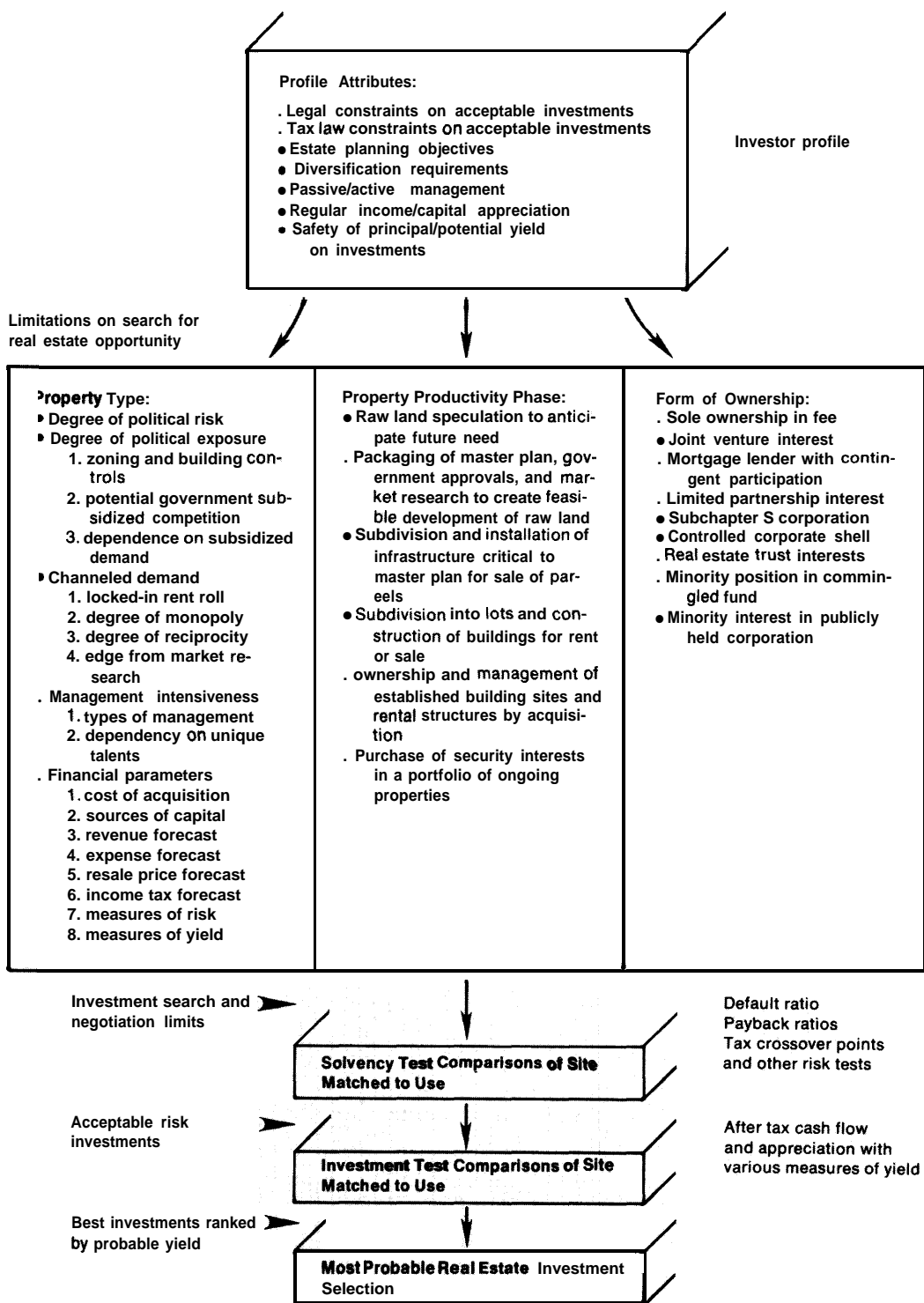


**Figure 6**  
**Analysis Process: In Search of a Use(s) For a Site**

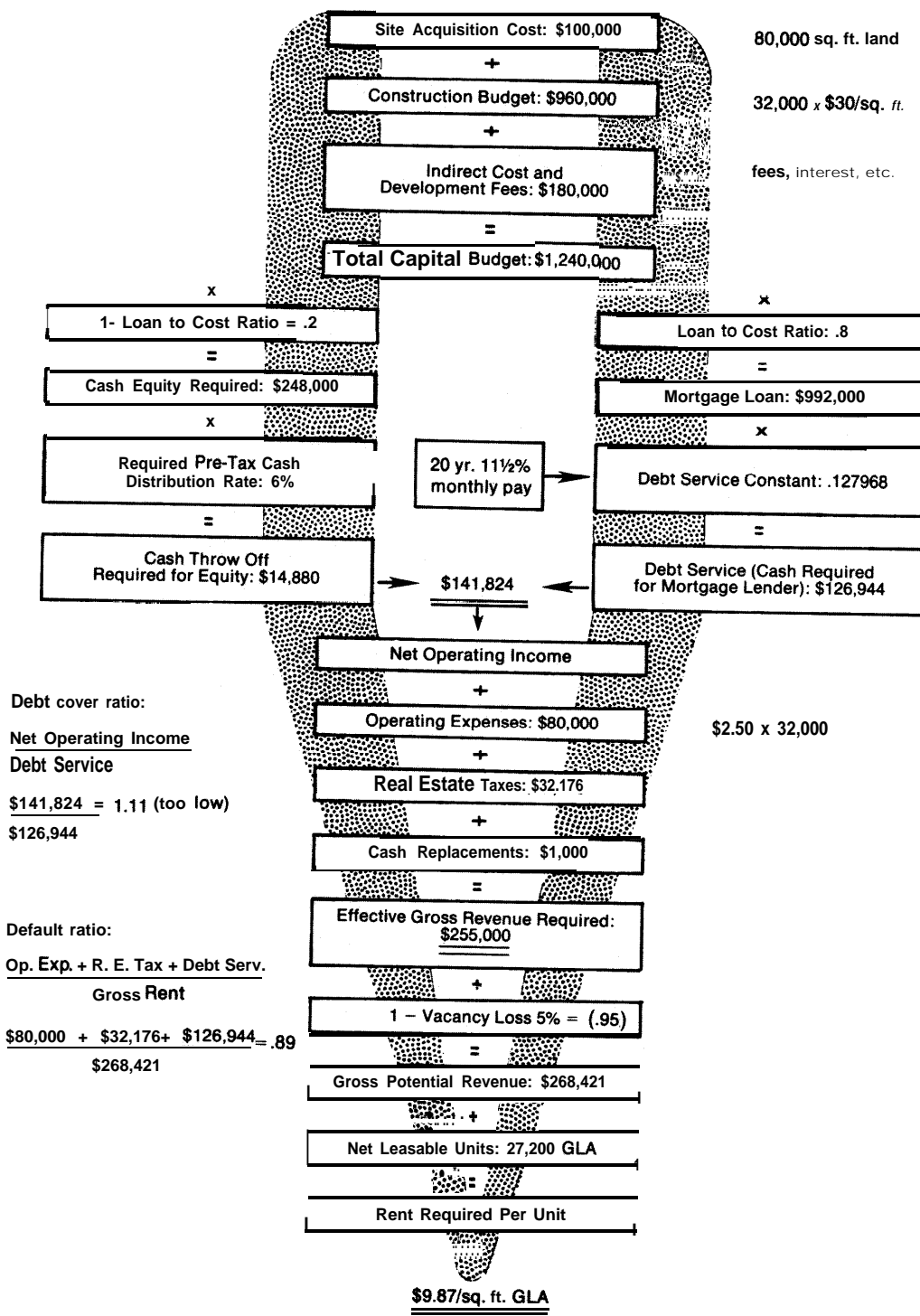




**Figure 7**  
**Process for Investor Selection of Real Estate**



**Figure 8**  
**Loan to Cost Ratio Approach**  
**(Frontdoor Approach)**



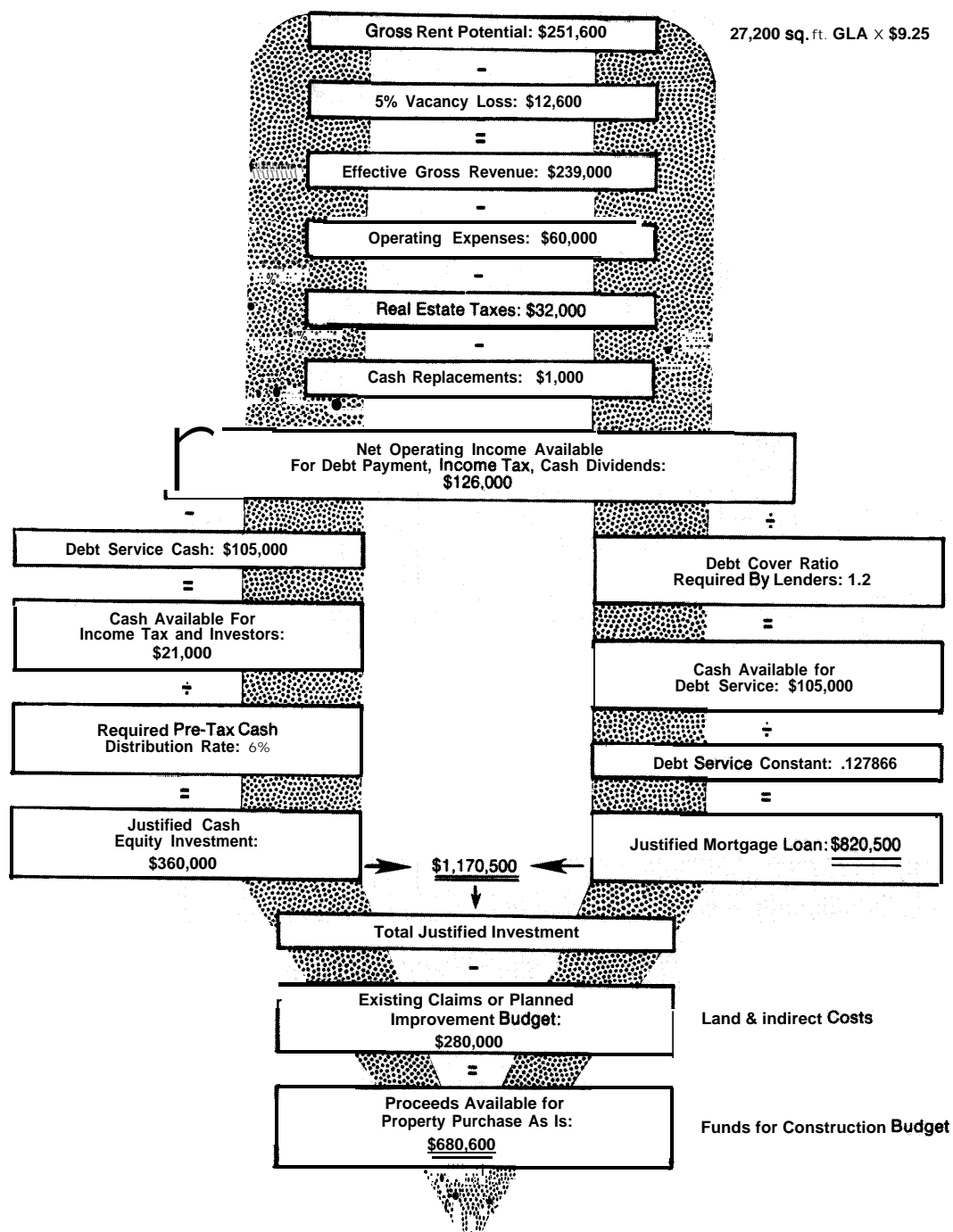
area. Property management indicates cash replacement costs of \$1,000 a year for carpeting, paving, and vandalism loss so that total cost required annually is about \$250,000. Assuming a vacancy of 5 percent, this effective gross revenue requirement must be generated from 95 percent of gross leasable area (GLA) of 27,200 square feet, since 15 percent of the 32,000-square-foot building area is committed to corridors, stairways, and utility areas. The balance is included in the leasable area charged to tenants. The result is that the building must rent for at least \$9.87 per square foot of GLA if all claims are to be satisfied. Unfortunately, the maximum rent found in the market for 2 years in the future is \$9.25 a square foot so the building is not competitive. An owner-occupant must question the cost of a building which exceeds rental value of equally suitable space, and a tenant will choose the cheaper space if both buildings are equal in quality and location.

As serious as the marketing problem may be to the developer, the key financial ratios of debt cover and default ratios would be unacceptable to any mortgage lender. The debt cover ratio is the relationship of net income to debt service; and for office buildings, institutional lenders demand that the pro forma ratio fall between 1.2 and 1.3, a parameter which has been relatively constant for many years (ratios available from the American Life Insurance Institute, Washington, D.C.). The solvency test is the cash breakeven point of the building as a business, often termed the default ratio. Lenders and equity investors may agree that for the small suburban office building with multi-tenants with 3- to 5-year leases, they would like to see a cushion of 15-20 percent between gross rents and all operating expenses and debt service commitments. The sum of operating expenses, real estate taxes, interest, and principal payments divided by gross rents indicates the breakeven point is too high at .89, even without allowance for cash replacements and improvements to the property. A cash breakeven or default ratio of .85 would mean a developer could survive a 15 percent vacancy or an increase in operating expenses and real estate taxes of 19 percent  $[(268,421 \times .1) \div 112,176 = .239$  or 24 percent less 5 percent vacancy]. At this point, the project would have to be scrapped, postponed, or sent back for redesign. It would make more sense to begin with market rent and solve for the total capital budget that would be justified, and this is what has been done in Figures 9 and 10. In Figure 9 the emphasis is placed on meeting the debt cover ratio required by lenders

while Figure 10 uses the enterprise approach of structuring the business to achieve an acceptable risk in terms of cash breakeven point or default ratio. Moving from rent to budget is sometimes called the "backdoor" approach but is the essence of many feasibility studies, and required on the FHA 2013 form for all multifamily FHA insured rental projects, and most state housing finance agency forms. The justified building budget, once determined, becomes part of the program but may be modified by adjustments for the discounted value of other investment objectives such as inflation gains, income tax benefits, or advertising value and other benefits to the owner/occupant.

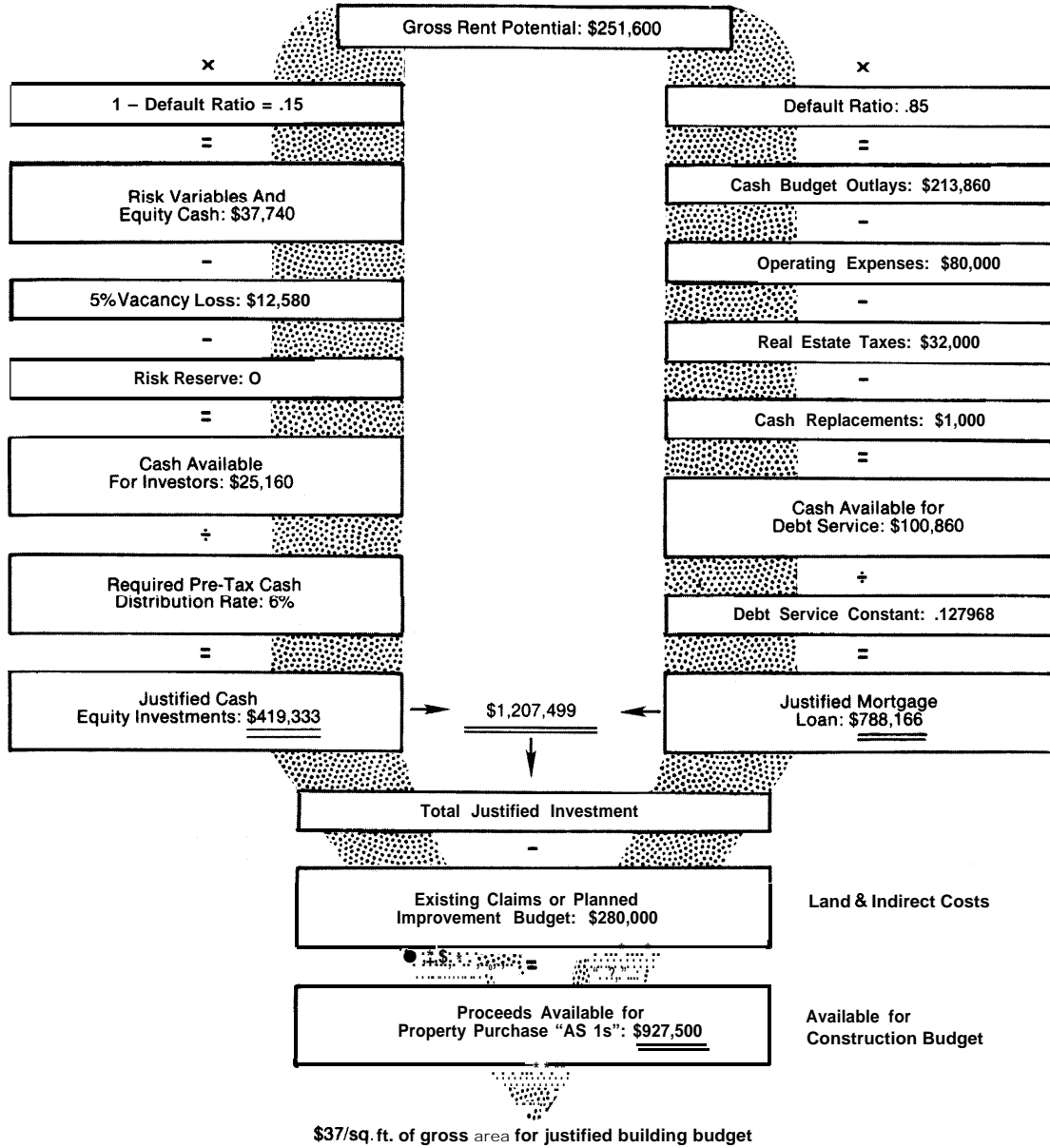
Figure 10 provides an alternative backdoor approach which is more useful in analyzing enterprise solvency and relative risk contributions of various claims on gross rent potential. Note that in Figure 10, the objective of holding the default ratio to 85 percent of gross potential rent reduces the cash available for debt service and therefore the justified mortgage loan from a maximum of \$992,000 to a maximum of \$788,000. The result is to increase the budget because the equity investor is willing to accept only 6 percent cash return as compared to the lender's claim of .127968, a cash payment which includes 11 1/2 percent interest and repayment of the loan over 20 years. The lender will not benefit from inflation and will suffer loss of purchasing power which explains his higher interest rate. The equity investor is willing to forego immediate cash income in favor of inflationary increases in future rents and property values. Because the equity investor capitalizes his share of income at a lower rate, the equity position provides considerably more cash. This example is an excellent demonstration that the principle of leverage requires that the cost of funds be less than the return on investment, which in this case would be \$126,000 net income divided by \$1,207,000 total investment or .1044. A 10 percent return is lower than either the interest rate of 11 1/2 percent or the constant of .127968 so that reverse leverage is the result. The more funds that are borrowed, the more risky the investment, and the lower the justified capital investment. Note that a small drop in borrowed funds permitted a large increase in cash equity, improving the solvency position as well as the budget to a more realistic \$37/square feet of gross building area. During the decade of the

**Figure 9**  
**Debt Cover Ratio Approach**  
**(A Backdoor Approach)**  
**Lender's Point of View**



\$890,500 = \$27.80/sq. ft. justified building budget  
32,000 sq. ft.

**Figure 10**  
**Default Ratio Approach**  
**(Another Backdoor Approach)**  
**Developer's Point of View**



1980s, interest rates are forecast to remain above 10 percent and more equity money will be provided for most projects, often raised through group investments such as partnerships and corporations. The loss of cheap money has made it almost impossible to finance 100 percent of a real estate project or to depend on leverage as the primary investment advantage of real estate. If equity investors must risk more of their own money, extending the payback period significantly, they can be expected to be more selective in regard to their investments and those whom they hire for their expertise in design and construction (see Messner, Schreiber, and Lyon).

### Regulation of Capital

There was a time when the real estate development process involved individual small firms specializing in just one step of the total development procedure. One firm would subdivide lots, another would build the houses, a third would build the retail buildings, and a fourth would specialize in office and industrial facilities. The latter were typically built primarily by users who rented their surplus space to the general public. Projects were small, prices were lower, and risk capital was local, although commercial property loans were available from national insurance companies. Today the larger development firms have integrated the entire development process from the conversion of raw land to building sites through the construction, marketing, and management of the total neighborhood. Not only has the scale and required capital expanded significantly from small developments to large mixed-use developments, but also the variety of expertise and therefore profit centers retained by a single firm has expanded in a corresponding fashion. The development firm is attempting to control as many profit centers in the development process as possible in order to increase its share of the cash flows that are generated by the development and operations process. However, larger scale projects in an

economy of generally rising and inflationary costs require very large amounts of capital. Therefore, the development process is a partnership between those with the expertise to produce the product and manage the development business, and those with capital, typically more passive institutions and investor groups. A shortage of high-quality buildings and changes in tax laws should reduce turnover and lengthen holding periods to span significant changes in future use. A general trend in the real estate development process toward selective investment by groups of individuals, institutions, or consortiums of public agencies and private real estate investors is leading toward more regulation of real estate financial instruments, similar to the regulation of securities by the SEC. The Internal Revenue Service is concerned with the various tax attributes of each financial format and of the participating members in the investment.

Since pension funds may provide large amounts of equity for real estate in the future, the investment standards of ERISA (Employees Retirement Insurance and Security Act) will influence real estate development. Federal levels of regulation of real estate investment may be expanded if efforts to control inflation shift towards selective credit control rather than general monetary and fiscal controls. In short, the public controls on land use and consumer protection which have so complicated development are being matched by progressively more complex federal, state, and trade association rules on capital investment in real estate (see Roulac).

Capital investment by municipal government and infrastructure agencies may be more regulated than capital in the private sector. Referendums are required for municipal bond issues. The Internal Revenue Service closely reviews economic development bonds and state and municipal charters. Also, Congress is reconsidering the proper uses of tax-exempt bonding because voters and legislators at all levels are more nervous about capital risk than are private investors.

### Investment Purchase of After-Tax Cash Flow

Money managers for long-term investment funds are purchasing a stream of cash payments over many periods of investment which are generated by real estate. Cash payments may result from rental operations (subject to the income tax), occasional refinancing of the rental project (generally not subject to tax), net profits from resale (generally subject to capital gains tax), or tax savings to other income

of the investor due to temporary deductions for accelerated depreciation, investment tax credits, or other tax incentives. It is this stream of cash which is termed cash throw-off before taxes or cash flow after taxes. When this cash flow is increased by a tax shelter of other income or occasional surpluses from refinancing, it is termed *spendable after tax cash*. Once the basic financial parameters of a project have been estimated using the frontdoor and the backdoor approach and studies discussed earlier, then the financial analysts convert these facts and assumptions to cash flow projections over 5 to 10 years' time using annual, semi-annual, or sometimes quarterly projections. Those who regulate real estate investment are providing administrative rules and parameters on cash flow projections so that financial analysis must move on from the simple basic frontdoor-backdoor approaches outlined in this monograph.

A sample cash flow program and its basic assumptions are provided in Figure 11. In the Report Section Number 3, note that Line 11 of the output shows cash throw-off before taxes. Line 16 shows cash flow after tax and Line 18 shows spendable after tax cash. Lines 30-34 give the before-tax ratios necessary for evaluating project performances. Observe that return on net worth, Line 30, decreases over time and that the default ratio, Line 42, improves with time, indicating that while the project is less susceptible to failure, it may not be leveraged enough. Line 34 reports the present value of the project if operated and then sold at the end of each year and this present value must exceed the original acquisition cost of the project or the cost/benefit ratio is negative. These types of forecasts are generally made with the assistance of small computer systems available from sophisticated mortgage lenders, appraisers, and consultants. The student of development should be aware of the gap between the basic methods of the frontdoor/backdoor approach in defining the financial parameters of physical planning and the detailed procedures of systematic capital investment.

Different investors may participate in the real estate project simultaneously by means of a variety of financial instruments, depending on their investment profile perceptions for income, capital gain, safety, management ability, etc. One investor may own the land and lease it to the real estate venture for a steady rate of return over a 40-year time span, expecting some protection from inflation because at the end of 40 years he will own the land and building. The second investor may prefer to be in the position of mortgage lender, gradually recovering his investment from amortization and possibly protecting his dollars from inflation by participating in a share of the increases in gross rent or net income. A third investor might be willing to accept a small cash dividend and be entitled to use all of the income tax benefits available to the equity owner of the project, while still a fourth investor would pay hard dollars up front for the right to manage the property for a certain percentage of the gross rent and the cash throw-off. The supply of capital from a variety of sources, contract instruments, and rate of return viewpoints is called *tiering* and requires a thorough knowledge of cash flow planning and financial ratio analysis as well as the present value concept of money. In recent years, tiering of capital for real estate has generally included public capital.

## Marketing—The Key to Development Market Research

The revenue flow, on which all assumptions for raising capital to build the real estate rest, begins with a customer. Selling is a method of persuading the customer to accept what is being sold, while marketing helps shape the product and the service to the needs of the user (see Rota). Marketing must serve three ultimate user groups: the individual purchaser or tenant, the collective users operating through the political process to approve or disapprove a project proposal, and future users who can be expected to convert a structure to changing lifestyles and needs at some point in the future.

Figure 11

Example of Computer Forecasting of Suburban Office Investment Cash Flows†

Pro Forma

investment Analysis of Suburban Office

REPORT SECTION 1

*GROSS RENT	\$ 267206.	*RATE OF GROWTH OF GROSS RENT	0.0375
● EXPENSES	\$ 60259.	*RATE OF GROWTH OF EXPENSES	0.0428
● R E TAXES	\$ 31198.	*RATE OF GROWTH OF R E TAXES	0.2950
*INCOME TAX RATE	0.3000	PROJECT VALUE GROWTH TYPE	2.0000
*VACANCY RATE	0.0500	WORKING CAPITAL LOAN RATE	0.1500
EQUITY DISCOUNT	0.1300	EXTRAORDINARY EXPENSES	\$30000.
RESALE COST	0.0500	REINVESTMENT RATE	0.0600
WKG CAPITAL RS	\$ 15000.	CAPITAL RESEER INTEREST RATE	0.0500
INVESTOR TAX CLASS		O OWNERSHIP FORM	1
INITIAL COST	\$ 1240000.	INITIAL EQUITY REQUIRED	\$ 295000.

ALL "\*" VALUES ARE AVERAGE AMOUNTS FOR HOLDING PERIOD OF 5 YRS.

COMPONENT SUMMARY						
TITLE	PCT. DEPR	BEGIN USE	USEFUL LIFE	DEPR METHOD	COST	SCH
SITE	0.00	1	0.		\$100000.	0
CONSTRUCTION	1.00	1	50.	4	\$960000.	0
SOFT COSTS	1.00	1	10.	2	\$160000.	0

MORTGAGE SUMMARY						
TITLE	INTR RATE	BEGIN YR.	END YR.	TERM	ORIG BALC	PCT VALUE
CONST. MORTGAGE	0.1500	1	1	1	960000	0.774
PERMANENT MORTGAGE	0.1150	2	21	20	\$952243.	0.685

REPORT SECTION 3

CASH FLOW ANALYSIS

	1960	1981	1982	1963	1964
1 GROSS RENT	251600.	251600.	264180.	277369.	291256.
2 LESS VACANCY	12560.	12560.	13209.	13869.	14563.
3 LESS REAL ESTATE TAXES	16000.	32000.	33920.	35955.	38113.
4 LESS EXPENSES	64000.	80000.	61200.	62424.	63672.
5 NET INCOME	139020.	147020.	155651.	165140.	174911.
6 LESS DEPRECIATION	46800.	45936.	45098.	44285.	43496.
7 LESS INTEREST PMTS	144000.	106836.	107256.	105485.	00
8 TAXABLE INCOME	-51780.	-7752.	3497.	15370.	27914.
9 PLUS DEPRECIATION	46800.	45936.	45096.	44285.	43496.
70 LESS PRINCIPAL PMTS	0.	13024.	14604.	16375.	18360.
11 CASH THROW-OFF	-4960.	25160.	33991.	43260.	53051.
12 LESS INCOME TAXES	0.	0.	1049.	4611.	8374.
13 LESS RESERVES	0.	503.	659.	773.	0.
14 CASH FROM OPERATIONS	0.	16699.	32283.	37896.	44676.
15 WORKING CAPITAL LOAN	0.	0.	0.	0.	0.
16 DISTRIBUTABLE CASH AFTER TAX	0.	16699.	32283.	37686.	44676.
17 TAX SAVINGS ON OTHER INCOME	15534.	2325.	0.	0.	0.
18 SPENDABLE CASH AFTER TAXES	15534.	19225.	32283.	37896.	44676.

MARKET VALUE & REVERS1ON

CASH FLOW ANALYSIS

	1880	1981	1982	1963	1984
19 END OF YEAR MARKET VALUE	1390200.	1470200.	1556510.	1651404.	1749106.
20 LESS RESALE COST	69510.	73510.	77926.	82570.	87455.
21 LESS LOAN BALANCES	960000.	939216.	924615.	906240.	888660.
22 PLUS CUM. CASH RESERVES	10770.	11612.	13061.	14468.	15212.
23 BEFORE TAX NET WORTH	371460.	469283.	569031.	675081.	766982.
24 CAPITAL GAIN (IF SOLD)	117890.	231090.	352185.	477634.	607650.
25 CAPITAL GAINS TAX	14147.	27731.	42262.	57316.	72918.
26 MINIMUM PEF. TAX	0.	0.	0.	0.	0.
27 INCOME TAX ON EXCESS DEP.	2660.	5501.	7670.	9996.	11665.
28 TOTAL TAX ON SALE	17027.	33232.	50132.	67312.	64803.
29 AFTER TAX NET WORTH	354433.	436052.	518699.	607769.	702180.



REPORT SECTION 4

BEFORE TAX RATIO ANALYSIS

CASH FLOW ANALYSIS

	1980	1981	1982	1983	1984
30 RETURN ON NET WORTH B/4 TAX	0.2592	0.3102	0.2650	0.2624	0.2443
31 CHANGE IN NET WORTH B/4 TAX	76460.	97823.	99748.	106050.	111901.
32 ORIG EQUITY CASH RTNB/4 TAX	-0.0169	0.0653	0.1152	0.1467	0.1796
33 ORIG EQUITY PAYBACK B/4 TAX	0.0000	0.0573	0.1667	0.2952	0.4466
34 B/4 TAX PRESENT VALUE	1284319.	1335057.	1365464.	1431662.	1473578.

AFTER TAX RATIO ANALYSIS

CASH FLOW ANALYSIS

	1980	1981	1982	1983	1984
35 RETURN ON NET WORTH AFR TAX	0.2541	0.2645	0.2640	0.2443	0.2266
36 CHANGE IN NET WORTH AFR TAX	59433.	81619.	82647.	86671.	94410.
37 ORIG EQUITY CASH RTN AFR TAX	0.0527	0.0652	0.10s4	0.1285	0.1514
38 ORIG EQUITY PAYBACK AFR TAX	0.0527	0.1178	0.2273	0.3557	0.5072
39 AFTER TAX PRESENT VALUE	1287405.	1322538.	1363042.	1399418.	1432025.

CASH FLOW ANALYSIS

	1980	1981	1982	1983	1984
40 NET INCOME-MARKET VALUE RTO	0.1000	0.1000	0.1000	0.1000	0.1000
41 LENDER BONUS INTEREST RATE	0.0000	0.0000	0.0000	0.0000	0.0000
42 DEFAULT RATIO	0.9698	0.8500	0.8213	0.7940	0.7679

REPORT SECTION 5

SENSITIVITY ANALYSIS

ANALYSIS YEAR 1S 2 = 1961					
DEFAULT RATE - NEEDED -		0.6500	0.8500	0.6500	0.8500
DEFAULT RATE - ACTUAL -		0.9696	0.8500	0.8213	0.7940
DIFFER -		-0.1196	0.0000	0.0287	0.0560

TO CHANGE THE DEFAULT RATE .01  
CHANGE ANY ONE OF THE FOLLOWING

		1960	1981	1982	1983
<u>CASH OUTLAYS</u>					
REAL ESTATE TAXES	BY	-0.1573	0.0788	0.0779	0.0771
TOTAL EXPENSES	BY	-0.0300	0.0479	0.0432	0.0444
FIXED EXPENSES	BY	-0.0466	0.0419	0.0432	0.0444
VARIABLE EXPENSES	BY	0.0000	0.0000	0.0000	0.0000
TOTAL INTEREST PMTS.	BY	-0.0175	0.0231	0.0246	0.0263
TOTAL PRINCIPAL PMTS.	BY	0.0000	0.1932	0.1809	0.1694
WORKING CAPITAL LOAN	BY	0.0000	0.0000	0.0000	0.0000
GROSS INCOME	BY	0.0097	-0.0085	-0.0062	-0.0079
FIXELI INCOME	BY	0.0097	-0.0065	-0.0082	-0.0079
VARIABLE INCOME	BY	0.0000	0.0000	0.0000	0.0000
<u>COMPONENTS</u>					
INITIAL INVESTMENT	BY	-0.1573	0.0766	0.0779	0.0771
SITE	BY	-1.9499	0.9750	0.9656	0.9366
CONSTRUCTION	BY	-0.2031	0.1016	0.1006	0.0997
SOFT COSTS	BY	-1.0633	0.5416	0.6365	0.5315
<u>MORTGAGES</u>					
CONST. MORTGAGE	BY	-0.0175	0.0000	0.0000	0.0000
PERMANENT MORTGAGE	BY	0.0000	0.0206	0.0217	0.0228

This example is based on earlier Figures 8-10.

†The computer output is a portion of report sections available from an educational program at the university of Wisconsin called MR CAP. MR CAP is a basic class tool in most real estate courses at the University of Wisconsin in Mad won and is available on many other campuses as well. MR CAP is the property of its author. Assistant Professor Michael L. Robbins, and sample output here is reproduced with his permission.

Data input file required of analyst for the five reports With follow.

1, SUBURBAN OFFICE, ULI EXAMPLE	200,1, S, JTE	301,1,960000,15,0,1
10,1380,0,1,1,5,27200	201,1,100000,0,0	302,1,1,1,1,2
30,s,5,.0s,2,03,13,0	202,1,7,0,0	303,1,7,0,0,1,5
40,251,600,0,.05,*	200,2, CONSTRUCTION	300,2, PERMANENT MORTGAGE
60,05,*	201,2,960000,1,4	301,2,35,115,0,20
70,16000,32000,.06:	202,2,1,50,0	302,2,12,2,21,0
130,54000,50000,02:	200,3, SOFT COSTS	303,2,0,0,0,0
100,.13,30,.06	201,3,180000,1,2	400,5
101,30000,1,0,2	202,3,1,10,0	403,s9
102,.15,1,05,0	300,1, CONST. MORTGAGE	999,99
103,.02,15000,.05,15000		

Marketing is also intended to protect the developer from the uncertainty of competitive pricing. Free enterprise includes the art of creating a monopoly, if only for a moment, so that as a developer one is not forced to use price cutting as a primary device to acquire business. Profit margins typically are not adequate to provide for price cutting. As one analyst once stated, "If you compete on price, there is always someone who can build for less, and by the time he learns his true costs, all of us will be broke." Therefore, marketing is intended to create a product which is unique, in terms of sensitivity to the needs of the consumer, and which reduces the other costs of the consumer to a point where the intended buyer or tenant will pay full price.

A strong marketing position requires careful research of the needs and budget limits of the prospective user. No American industry spends less on legitimate consumer research and product development than does the real estate industry. This failure to spend even 1 percent of project budgets on primary research about the intended consumer is one explanation for many business failures of real estate projects across the land. Developers simply misjudge the number of consumers in the market, the needs as those consumers perceive them, and the rate at which new units can be absorbed in the marketplace. There is great irony in the fact that mortgage lenders expect insurance premiums to be paid in advance in case the project should burn down but typically require nothing in the way of original research to discover whether the project will rent up. Nevertheless, real security for their loan is a customer, not a fire. Lenders assume that a developer with "a track record" knows his market from past projects, but past success is no guarantee that any demand remains unsatisfied or that market action has not shifted its location and product preferences. Design serves society best when it serves the intended user rather than the normative standards of the designer or developer or yesterday's market.

### Market Data Versus Merchandising Data

Market data is typically aggregate data describing population by age group, income category, business activity, location of residence, average price of home, and other statistical information typically collected by planning offices, census data, and other public sources. Market data will assist in scaling the project so that 800 housing units are not planned for a community that will only need 600 in the foreseeable future. It may measure the expected rate of absorption for broad categories of space, say 500,000 square feet of class A office space, 200 condominium units, or 600 single-family lots per year. More to the point, however, is how much of that potential market can be captured for a specific project and this capture rate is related to merchandising data.

Merchandising data is typically collected with a specific project in mind and involves primary research by the analyst with the objective of determining *the competitive standard* of project attributes and discovering the unmet needs in the market which could provide the *competitive edge*. In some markets, the competitive standard becomes a very precise and well-known set of specifications. The competitive standard in apartments in the Southwest reveals consistent standards for the number of inches of counter space, cabinet fronts, the weight of carpeting, the cost of the dining room fixtures, and the basic size of rooms. The consumer has taken these for granted and competitive developers have studied each other carefully to measure what the consumer expects as a basic minimum. Everyone expects a bathroom; however, the bathroom may have a variety of layouts which are more convenient, private, spacious, etc. Office buildings also may have a basic competitive standard of one parking stall for every 300 square feet of gross leasable area. Ceiling and lighting systems may be standard, and wall systems may be standard.

A competitive edge depends on finding a true unmet need of a particular consumer group. It is not an edge obtained through gimmicks and cleverness on the part of the designer or the developer. The competitive edge typically is created by finding

methods to enhance user self-esteem or to reduce the cost of friction, of anxiety, or of inefficient space layouts housing the user's activity. Medical office layouts can be more efficient with structural column systems which may not fit general office use with the same net product of useable space. Customers may be attracted to a store with better access to parking, wider parking stalls, or better linkages to work and home. An alternative is to reduce the level of anxiety of the user in terms of security of property and person or as to future adjacent development or control of other tenants in the project. A third method of creating a competitive edge is to enhance the consumer's sense of well-being by selling him on the more comfortable romantic life-style of a particular project, or the prestige which is to be transferred and contributed to the consumer for locating in a specific project. Another method of building a competitive edge is to shift the balance of who typically pays and who typically benefits in the marketplace. For example, the apartment project located on the site adjacent to a major park provides all the benefits of open space, control of neighboring properties, and convenience of recreational alternatives without necessarily requiring the tenant to pay the true cost. Of course, it may be that the site is more valuable because of its proximity to publicly maintained and operated amenities. Nevertheless, over the long run, there is a significant cash cost benefit shift from those who live closest and enjoy the park most to those who are expected to pay real estate taxes in general to support parks in other parts of town from where they themselves live.

Finally, the competitive edge may be created by shifting or reducing the risk of change. For example, a primary advantage of a shopping center development where the developer has achieved an operating agreement with three or four major department stores is that he can now promise the smaller retailers who locate within that shopping center control of the total shopping environment by a single landlord. In addition, the operating agreement guarantees joint marketing and promotion of the center by major department stores who have committed themselves to operate under their own brand names for at least 25 years in the future. The developer will maintain certain tenant mixes, park-

ing ratios, and housekeeping standards for long periods of time. Thus, the small retail tenant is willing to pay a premium rent to be in a shopping center as opposed to locating in a commercial strip where there is no assurance that those department stores on which he may depend for primary draw, the parking on which he may depend for convenience, and the tenant mix and marketing efforts in his symbiotic relationships can be sustained over long periods of time without drastic and critical changes detrimental to his business.

There is little monopoly to be gained by providing the identically same product as those already in the marketplace. Monopoly is achieved when you can find a group unserved adequately by present offers, a gap, if you will, of unmet needs within an array of small micro-markets that in total create that vague and nonexistent phenomenon called the real estate market. Consider that a 25-unit apartment project today may require as much as \$1,000,000 in capital and \$240,000 of annual rents (sales), which is more capital and more sales than is characteristic of 65 percent of all American enterprises. Nevertheless, this big business needs only 25 customers who find it unique because of its sensitivity to their needs.

#### **Marketing Research and the Collective Consumer**

Recently, marketing research survey techniques have been used advantageously to control political risks which are inherent in a regulated process like development. Before spokesmen for neighborhoods or trade associations or other collective segments of the community can render public opinions which are difficult to retract, it is useful to discover whether expressions of concern about traffic congestion, environment, or fiscal impacts are only good reasons for the tendency of people to fear change in the physical status quo of their lives. These fears can be recognized and resolved in preliminary plans to defuse negative political action. Indeed, some political pollster firms can be found doing housing, downtown mall, and redevelopment attitude studies in advance of public and private planning efforts.

For example, a developer acquired a three-block area of a downtown, single-family residential area with the intent to upzone the land for garden apartments. The plot had been vacant for many years, and there was now a scattered stand of walnut and maple trees. A political survey by mail of residents within half a mile of the site generated a high rate of response so that the developer was able to defuse latent fears before any preliminary plan galvanized the neighborhood into an unnecessary political confrontation. The plan showed that two dead-end streets were cul-de-sacs and flanked with single-family townhouses compatible with existing homes. Favorite neighborhood pathways were maintained in the site plan, paved, and lighted. Resident parking was placed below the proposed structures; trees were mapped and virtually all were saved in the placement of structures. Guest parking was bermed and driveway outlets carefully placed to avoid conflict with a neighboring church, arterial, and bus stops. The architectural styling required use of old brick, shingles, and the wood detailing of the early Victorian and midwest farm styles which characterized the neighborhood. Finally, a Victorian gazebo was placed at the key intersection as a bus stop and as the logo for the development.

The neighborhood ad hoc committee not only approved the architectural program, but also secured the approvals of the City Planning Commission, which issued a commendation. Research prevented inadvertent detailing of preliminary plans which might have triggered bitter political resistance leading to a hardening of positions to avoid personal embarrassment. Egos in place of facts ultimately leads to unreasonable and noncommunicative negotiations of all parties in the real estate development permit process.

Another primary problem in marketing research is determining whether the collective consumer truly understands the fiscal impacts of broad value judgments which are often the grist for newspaper and political debates. Growth management may need to be redefined in terms of long-term fiscal impacts, as has been done for a number of communities in California (i.e., San Jose) and elsewhere recently (see Rota; also see Gruen Gruen + Associates). The residents may be working against their better interest by blocking further development of a tax base which can share in the costs of providing adequate water treatment, expanded sewer facilities, and other services desired by the community.

## The Prearchitectural Marketing Program

Careful consumer marketing research through a telephone survey, mail questionnaire, and personal interview permits development of a prearchitectural marketing program for each project proposal. First, it is necessary to define a particular market segment or micro-market toward which the project is directed. One developer in the Chicago market has identified 13 single-family home purchase groups ranging from the young family with children to the unmarried, single individuals seeking some tax shelter for his professional income. Each group is surprisingly predictable in terms of needs, budgets, season of the year for purchase, and style preferences. Another award-winning builder in Denver summarized the personality of single-family homebuyer segments at the upper end of the market by stating his firm catered to the French cuff and studs set, competitor A reached the button-down collar boys, while competitor B focused on the Pendleton plaid woolen shirt crowd. Similarly, office building users can be segmented by those whose customers come to them versus those who go out to meet the customer on his turf, those linked to the courthouse or the financial district and those linked to the suburban service base, those linked to production facilities and those closely linked to merchandising areas, and so on. Each will rank style, convenient access of parking, special linkages, monthly costs, and peer group proximity quite differently.

A significant part of the merchandising strategy is anticipation in the design program and product perception by means of the sales themes, logos, and competitive sales points to be advanced by the project. Moreover, the designer needs to consider what will be used as an initial sales area, which units may serve as models, and whether the approach zone to the project is a positive reinforcement of project image. The approach zone, of course, will consider signs, entrances, paving, site development, and the visibility of positive project amenities to the prospects arriving on site by foot or by car. Too often the architect treats the merchandising campaign of the developer's marketing force as an area of discipline remote and unrelated to the design process. The result will be projects like those designed for the New York Housing and Urban Development Authority, which placed chic, cubist, early Marekesh, epoxy apartments in small New York communities which favored the New England colonial and early American styles of architecture. Neither logo, project title, nor furnishings related to the preferences and patterns of the community, and the initial fears of subsidized housing were simply aggravated by providing no sense of architectural

identification with the community. Marketing is not a distinct discipline from design but is in fact a significant portion of the prearchitectural program.

### Anticipating the Future User

Most structures outlive the lifestyle, cultural, and business needs for which they were originally intended. Recently, development emphasis has been placed on the recycling of older buildings to new and unintended uses as compared to their original function. These adaptive use efforts have been most successful where floor load capacity in the old structures was generous, ceiling heights were adequate, and column spacing was modular and flexible. Long-term investors now recognize the probability that many buildings will change uses during the time of ownership so that investment safety is linked to project designs which anticipate convertibility of space-time units from one function to another.

The alternative to recycling is a high profit margin and high rate of return on capital which permits rapid recovery of investment and junking of improvements at the end of their useful life. A multi-story parking garage might be better designed so the floors are flat rather than sloped and have a higher floor load capacity than required for American over-sized automobiles. In the foreseeable future smaller cars will mean a higher concentration of weight loads, and in the longer term it may be desirable to convert parking garages to office space or warehouses. The added cost might be offset by parking fees, higher salvage costs in the structure, or lower interest rates on capital provided.

For many years, rental office buildings have used utility grid systems, modular ceiling units, and HVAC systems which anticipate continual re-arrangement of office layouts and equipment. This anticipation of future users must be extended to other forms of real estate and the added capital cost incorporated in the capital budget and rent structure. Computer cash flow models have made it possible to compare cost/benefits of alternative building concepts in terms of maximizing the present value of spendable cash for private investors or minimizing the present value of building life cycle cost outlays on public buildings. It is imperative that

all parties in the development process learn present value methods of money management reflecting compound interest over time (see Grant and Ireson). Although future needs and lifestyles cannot be anticipated with great accuracy, there is growing recognition that the undefined future user must be considered explicitly in the initial investment formula and design program. Institutional investors need long-term productive investments with protection against the reverses of a fast changing society; society needs structures which can be recycled in order to conserve the energy required of new development and to speed the response of the urban fabric to changing conditions, thus avoiding the wholesale obsolescence of neighborhoods, the glacial pace of land use succession, and the intolerable cost of past urban renewal programs.

Foreseeable future trends have many subtle impacts on real estate development. Conservation of prime agricultural lands for future food supplies may shift residential development into the hills or into higher density condominiums in formally exclusive, detached single-family home areas. Subdivision layouts will recognize the need for better solar orientation of structures, to anticipate improved technology and changing cost effectiveness ratios for solar energy, and home design will invest in features which reduce heat gains and losses, not only to reduce current energy consumption, but also to attract even more energy conscious buyers at the time of resale, thus protecting investment value. As these added costs modify the pricing structure and trade-off issues for the real estate consumer, the defined competitive standard will begin to shift. For example, in California the basic 1,500-square-foot house has shrunk recently to perhaps 1,300 square feet in order to maintain price, to reduce the space that must be heated and cooled, and to hold total monthly housing costs within income limitations of the consumer. Notice that the ability to internalize these requirements in the capital cost/monthly payments and therefore the cash cycle of the user begins to provide an infinite number of trade-off decisions for the developer, the consumer, and the public agencies regulating the development process. Overregulation can adversely influence capital cost and monthly cash payments (see U.S. General Accounting Office). Sensitivity to the cash cycle and therefore the rent or purchase price that is within the means of the consumer permits a gradual and economically smoother transition to a modified view of the marketing and development process.

## The Ethics of Fit and Monopoly

The concept of monopoly or design to channel demand insulated from direct price competition to a project is often regarded as suspect with respect to the free enterprise system, but just the opposite has been demonstrated here. There is a direct relationship between the ethics of fitting a project to the environmental constraints of a site, to the needs and budget of the eventual user, and to the concerns and fears of the collective consumer, and the uniqueness of a project which creates a monopolistic dimension in its pricing. A full price willingly paid by the individual user measures satisfaction and maximizes investment value by stabilizing many of the critical risks of the development process for the investor. Feasibility was defined as measuring the fit of the project to its physical context, to its intended users, to the objectives of the investor, and to the limited resources of the developer and the community. While fit of a project design to soil profiles and topography maps is taken for granted, lest the structure collapse or sag, it is not generally accepted that the project will financially collapse if it is not sensitive to customer profiles and cash cycle topology. These steps will greatly reduce both the variance between expected revenues and those which are achieved and the variance in cost from budgets to those which are actually incurred, as well as reduce the risk of upset due to political resistance, rejection by the financial markets, or inflexibility to changing conditions and market needs. Sensitivity is the source of monopoly pricing, and strong demand with stability of the pricing structure is the primary concern of the financial manager, the marketing director, and the physical planner. In the past, prearchitectural or design programs were primarily concerned with product specification and site characteristics. However, modern design philosophy has been broadened to recognize that the product and the site contribute significantly to revenues and expenses of the enterprise. Because the financial flows of the project are intimately and inseparably related to the design product, it is necessary to recognize the cash cycle criteria of the users, the selection criteria of capital investors, and the mechanisms of risk management with which capital budgeting decisions are made in the development process.

## Summary

Each new development, large or small, is an enterprise and a subsystem within a larger environment. The form and behavior of that enterprise will be a consensus or equilibrium between external forces of interest and the force of talents, energies, and resources internal to the development enterprise. Such an equilibrium is reached more efficiently through an appreciation of joint objectives of development participants rather than through confrontation and desperate pursuit of total victory in a contest of wills. All of the development groups—the consumer group, the production group, and the public infrastructure group—are limited by their cash receipts and the need for solvency as well as dependent upon one another for their cash income; each has a financial interest in the survival of the others. Thus, solutions to business and political problems are most productive in a cooperative environment (see McDonald).

The development process is a loop system involving many subsystems or cash cycles. Today's buyer of a development product is tomorrow's customer for services from the public infrastructure. Without new customers the infrastructure may not operate at its most efficient scale, thus overcharging consumers or deferring charges to future users.

The development process is the interaction of the three major groups to produce land use plans and building specifications where the present value of the benefits to each group exceeds the present value of all expenditures that will be required of each group over the life of the development. More specifically, it is a cash cycle investment which requires: 1) present value of the benefits to equal or exceed present value of the cash outlays and 2) cash receipts from all sources including borrowing and ownership interest to equal or exceed net cash outlays, including repayment of debt and dividends on ownership capital, in each accounting period in order to survive as a justified economic project. Public buildings should be designed to minimize the present value of all cash outlays, direct and indirect, over the life of the facility, and private development should maximize the present value of spendable cash dollars after all expenditures, including taxes.

Real estate development, whether public or private, is constrained by solvency and uncertainty. Because cash projections depend on an infinite number of

assumptions, explicit and implicit, about the future, all parties to the development process must tolerate variance in their cash planning and negotiate a risk management plan which is equitable. Risk should be reduced through merchandising research, tight control of development plans, and incentive rewards and penalties for managerial operation. Risks must be allocated to match expertise and responsibility for execution of a plan or responsibility for time delay. Changes to cash plans must occur within cash tolerances of all parties with a vested interest.

The development process historically has been viewed in terms of individual benefit (highest and best use) and has only recently accommodated political interests (most probable use); the search is now on for the law and technology in which real estate development can reflect the needs of society as a cluster of groups (most fitting use). The development process is our most challenging manufacturing process because its subsystems are complex and because it is the instrument of change which affects all of a community and a society.

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