

JAMES A. GRAASKAMP COLLECTION OF TEACHING MATERIALS

I. MANUSCRIPTS

A. Published Books

1. A Sketchbook of Feasibility Concepts and Techniques:  
Manuscript which became A Guide to Feasibility  
Analysis

**A SKETCHBOOK OF FEASIBILITY CONCEPTS AND TECHNIQUES**

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## PREFACE

Four years ago at the University of Wisconsin School of Business it seemed like a good idea to offer a capstone course for our graduate program in real estate investment analysis and appraisal and to glamourize it with the title "Feasibility Analysis - 761." Ever since then we have been attempting to define "feasibility" and to provide some logical framework with which to structure materials which instinct told us were relevant but for which our formal training had provided no classification system. What began as a "how-to-do-it" course evolved into a critical review of "what-is-it-we-are-doing?" course. Each semester we have succeeded in adding one or two more thoughtful lectures to the course and then, to cover the embarrassment of having said all we know, in dispatching the students into the field to do field projects, often in joint projects with the land planning students in the University School of Landscape Architecture. This Sketchbook summarizes what we have taught each other about evaluation of the creative process of putting together a real estate project.

Feasibility testing is a cycle of "stop-and-go" thinking. First someone brainstorms an idea, attempting to remain free of as many premature criticisms and conventional wisdoms as possible, which is the "go" process of creativity. Then at a certain point it is necessary to review and judge what is being proposed against some context of objectives and constraints and this step is the "stop" process. Thus, there is an expanding cycle of planning and of testing alternatives, intended to solve a problem. Indeed, the "stop" process of critical review may provide the next "take-off" point for the creative "go"

process. There are as many points for feasibility research as there are decision points in the life cycle of a real estate commitment.

This Sketchbook has attempted to provide a definition of "feasibility" and some small element of discipline to the methodology with which an appraiser should approach assignments within the general subject area. It is not meant to be a handbook of formulas for testing all types of land use but it does provide source materials for discovering good technical materials already available. Indeed, a primary point of this essay on feasibility is that unlike an appraisal where the format and premises are relatively fixed by appraisal doctrine, the essence of feasibility analysis is devising a correct statement of objectives and tests of proposals for meeting these objectives tailored to each specific case. The appraisal question is concerned with the narrow issue of "will it sell?" when at least one buyer is born every minute while the feasibility question is concerned with "will it fly?" for a specific old fool -- your client. This Sketchbook raises more questions than it answers and therefore has deliberately avoided the more authoritative terms of "guidebook" or "handbook." As the title Sketchbook implies, its contents are spontaneous, impressionistic, experimental, incomplete, and an ongoing exercise in the self-education of the author. No promises, no illusions, and no money back.

We hope that comment and suggestions for improvement will be forthcoming immediately so that following a year of dialogue and inquiry on the subject at hand we may rewrite and disclaim this first edition. The primary role of this Sketchbook is to provide a flimsy framework for organizing the rich experience of those in the field who have proceeded independently to devise their own art forms in the murky specialty of

"feasibility studies." It is an old teaching practice to meet tough questions from the students with another unanswerable question, a chain which escalates until the final answer is found by disposing of the student with a degree or the professor with hemlock. It is anticipated by this author that this rambling essay will be used as part of a certificate granting one day seminar.

Many persons have offered their suggestions but this commentary was published nevertheless due to the patience of Donald Snyder and his Committee and the dedicated secretarial help of my accomplices, Mrs. Dorothy Beck and Irene Liang.

James A. Graaskamp  
Madison, Wisconsin  
August 1970

## A SKETCHBOOK OF FEASIBILITY CONCEPTS AND TECHNIQUES

### CHAPTER I

#### A. Expanding Scope of Appraisal Assignments

It has been the experience of many appraisers in their community that their opinion is sought on all aspects of real estate decision-making. Many of the studies which they are asked to provide as a professional service are "valueless," as so well stated by Charles F. Seymour,<sup>(1)</sup> who went on to distinguish between valueless and worthless. Clients seek advice on plant locations and office sites, architects support design proposals with economic justifications supplied by an appraiser, and local syndicates often invite an appraiser to join their group to benefit from free counseling on the course of action the group should follow on an investment decision. In short, there is opportunity for a dual role as appraiser and counselor. The appraiser has long been regarded as a **land-economist**, qualified to participate in land-use marketability studies for urban renewal and cost-benefit studies for government projects such as airports and expressways. However, in many ways big pictures painted with a broad brush require far less immediate precision in terms of decisions than the small cameos that represent the investment of private persons who unlike great agencies can not survive or shift the cost of premature forecast or technical oversights. This sketchbook is primarily concerned with the big decisions of relatively little people who must operate in the real estate world as they find it with little capacity to absorb a serious mistake by their professional advisors. As the best known analyst in the field has said, "the feasibility study is any



analysis aimed at discovering whether a specific project or program can actually be carried out successfully. Hence, every such study involves a particular development concept on a particular site."<sup>(2)</sup>

"Success" has many more facets, however, than simply creating a present value of financial returns greater than cost to construct and in that reality lies the theme of this Sketchbook. The framework of appraisal analysis is rooted in economic theory; the character of feasibility analysis is set by the pragmatism of business and political methods.

#### B. Expanding Membership in the Real Estate Team

The appraiser like the architect is finding it difficult but necessary to merge his professional concerns with a variety of specialties and options which focus on real estate problems including the various engineering specialties, the ecologists and sociologists, the industrial systems people, the planners, and the money managers. In the past ten years several corporate giants have appeared in the real estate consulting field which combine staffs of forty or fifty people of various specialties, which can focus on any aspect of a single real estate problem as required. Some of these firms began as land planners, others as appraisal firms, and others as economic consultants or construction specialists. Who has not seen an architectural firm letterhead with an appraiser listed as a partner, a construction firm that merchandises economic studies, or a brokerage firm which advertises itself as an investment research company?

In this era our national space rocket program has at least proved that as a country we can build what we can finance and in the urban space race we can build for any environment which can be supported by public and private finance. The private or public<sup>(3)</sup> entrepreneur in

real estate will direct the thrust of inquiry by a committee of professional specialists involved today in the techniques of city building and land-use. The appraiser is in a preferred position to chair this committee of talent if only he can ask the right questions, recognize and challenge the implicit assumptions, and perceive the financial implications inherent in the expertise of others. The appraiser is no longer expected to be an encyclopedia of answers but for feasibility analysis no longer will he have license to assume away the critical questions. All of the technical contributions of the other members of the team must eventually be synthesized by the appraiser into an economic evaluation to justify the financing from which all else is possible. Feasibility study is a process of collaboration rather than the prerogative of a single profession.

### C. The Concept of Feasibility Analysis

The terms "feasibility study" or "economic study" are no more useful or precise than is the generic term "theft" which includes robbery, burglary, embezzlement, etc. among its specific variations. First, it is necessary to define the concept of "feasible" in order to structure the process of determining whether a real estate project has this elusive quality, akin to defining water as "fresh" or a woman as "attractive." Then it is vital for an analyst to understand why a feasibility study is not an appraisal. Indeed, an appraisal is a very narrow form of a feasibility study for a fictional client who exists only in the imagination of appraisal theorists.

There is great similarity between the broad concerns of feasibility analysis and the process of physical design and the would-be analyst is

urged to read Notes on the Synthesis of Form by Christopher Alexander (Cambridge, Massachusetts: Harvard University Press, 1966). The real estate analyst is testing the marketing, legal, financial, physical, and social dimensions of a real estate project. The client who is putting together a "deal", solving a land-use problem, or making a real estate decision has control over only certain variables in his situation. He can give form to these variables but this form must be compatible with the context of all those factors which he cannot change and which place demands on the solution or form which he selects. The designer speaks of the "fitness" of a solution to the context in which it must operate and the basic object is to find a solution which is ideally frictionless. Context defines the problem, form-giving is the proposed solution and feasibility analysis is concerned with identifying and measuring the decisive elements of fit between the two. Indeed, feasibility analysis of most projects is primarily a search for a possible material and potentially defeating misfit. A misfit represents a source of dissatisfaction or failure to achieve certain objectives, and of changing conditions. Depending on the assumptions related to the misfit attribute, it represents a primary indicator of feasibility. The process of achieving a good fit of a real estate project to the context in which its investors and the physical real estate must operate is often a negative process of neutralizing the incongruities, the irritants, or unpredictable forces in context which could cause very unsatisfactory outcomes for the space user or the space owner.

This abstract thought that feasibility implies satisfaction of objectives and a freedom from the financial irritations of certain types of

incongruities or misfits in a proposed course of action can be reinforced by a few actual situations:

EXAMPLE #1

A Townhouse project in Cleveland was not feasible because of the noise of the adjacent inter-state truck route until the irritant was neutralized by an earth berm which reflected the noise above the site, thereby providing the required domestic attribute of peace and quiet.

EXAMPLE #2

An apartment project was attractive in every way except that the financial default point was too high until mortgage terms were revised to produce a default ratio that fit the criterion of the lender and the acceptable financial risk level of the owner.

EXAMPLE #3

Rezoning of a site for apartments was an irritant to a contiguous single-family home owner until the irritant was neutralized by purchase of the home of the complaining property owner and introduction of a buffer strip of single-family lots on the development parcel, thereby making the unfeasible "feasible."

D. Specific Definition of "Feasibility"

A real estate project is "feasible" when the real estate analyst determines that there is a reasonable likelihood of satisfying explicit objectives when a selected course of action is tested for fit to a context of specific constraints and limited resources. The language of this definition has been chosen with care and contains a number of critical implications:

1. Client objectives are unique and a major function, perhaps the primary function of a feasibility analyst, is to seek a correct statement of the problem in order to evaluate the fit of a proposed solution to that problem. These objectives are often peculiar to the client and irrational in the narrow economic sense of "highest and best use" that maximizing returns is the rational overriding objectives.

2. "Likelihood" implies explicit recognition that forecasting results involve the use of many variables about which subjective risk judgments must be made. The real estate community may not be ready for the more sophisticated concepts of probability. Still a typical real estate practitioner is usually able to sense correctly that a horse is a "nag" without being qualified to be the odds-maker for the racing sheet.
3. The concept of "satisfying" must be organized to deal both with intangible requirements of social planning and real estate "amenities," and with the more tangible decision points of financial ratios and dollar profits.
4. Identification of the "context of specific constraints" requires research of limitations not only in zoning or soils or structural layout but in the politics and preferred transaction styles of consumers which may rule out certain courses of action. Specification of political-legal or marketing requirements is analogous to modern design methods referred to as pre-programming of an architectural or engineering project to define the functional attributes required of an adequate solution.
5. "Limited resources" is a broadly defined concept which relates to all of the financial, talent, good will, and time tools which may be tapped by the decision-maker while providing acceptable alternative courses of action.

#### E. Framework of Total Feasibility Analysis

The structural framework for comprehensive development of feasibility

analysis (and the structure of the balance of this Sketchbook) provides for identification of objectives, existing constraints and self-imposed standards, and finally alternative courses of action in the following subject matters:

1. Objectives of the parties at interest and for whom the feasibility study is done. (Chapter II)
  - a. Strategic objectives and priorities.
  - b. Acceptable tactical alternatives.
2. Market trends and opportunity areas. (Chapter III)
  - a. Aggregate data on local population, employment, income, etc.
  - b. National economic and political policies affecting incentive, timing, risk, etc.
  - c. Industry trends relevant to the client.
  - d. Significant popular attitudes and trends.
3. Alternative merchandising targets or market segments (Chapter IV)
  - a. Special micro-markets with space needs.
  - b. Product and price specifications.
  - c. Effective demand for the product at a price.
  - d. Preferred merchandising methods.
4. Legal-political constraints and alternatives (Chapter V)
  - a. Regulatory constraints on the parties at interest.
  - b. Regulatory controls on site and space development.
  - c. Exogenous political structure influencing alternatives available.
5. Esthetic-ethical constraints and alternatives (Chapter V)
  - a. Project relationship to immediate community.
  - b. Project obligations to space users.
  - c. Prime contractor-subcontractor relationships.
  - d. Client obligations to his preferred personal commitment pattern.
6. Physical-technical constraints and alternatives (Chapter VI)
  - a. Space user requirements as to location and improvements.
  - b. Site attributes satisfying elements of item #1.
  - c. All other space product engineering considerations.
7. Financial constraints and alternatives (Chapter VII)

- a. Time line or assumed calendar of events for financial assumptions.
- b. Capital budget required and sources.
- c. Operating budgets and revenue sources.
- d. Direct cash profit expectations.
- e. Indirect benefits and returns.
- f. Measurement of risks and yields.

It is recognized that the appraiser or feasibility analyst may be called upon to do only a portion of the total analysis briefly outlined above. Nevertheless someone must provide explicit assumptions in those elements listed prior to financial analysis or someone must specify the preliminary objectives and viewpoint from which the project must be justified as feasible. Every feasibility study must have the specific viewpoint of a single decision maker in order to define success in terms of satisfaction of goals. Profitability and thus feasibility in a FHA 236 subsidised rent project has one measure for HUD reviewers and quite another measure for the project developer. The suggested framework above will be shown to be an outline for a statement of limiting conditions and assumptions under which the additional inputs of the real estate analyst must operate.

#### **F. Classification by Feasibility Component**

The range and variety of considerations which may be involved in a total feasibility analysis are seldom done at one time by one individual. Indeed, the appraiser may be presented with a complete project design or existing facility and asked only to comment on its economic aspects. How well does it fit market and merchandising contexts? How well does it fit capital budget constraints or prudent investment locations in view of resale value constraints? Nevertheless the components give rise

to the proper nomenclature of the various reports that may be lumped under the general term "feasibility study."

1. Strategy study: selection of objectives, tactics, and decision criteria.
2. Market analysis: economic base studies or other related aggregate data review.
3. Merchandising studies: consumer surveys, competitive property analysis, marketability evaluation, etc.
4. Legal studies: opinion on potential legal constraints, model contracts or forms of organization, and political briefs.
5. Compatibility studies of project to community planning, conservation standards, or other public policies.
6. Engineering, land planning, and architectural studies.
7. Financial studies: Economic modeling, capital budgets, present value and discounted cash-flow forecasts, rate of return analysis, financial packages.

#### G. Classification by Contents

There is great confusion on the proper nomenclature and classification of the variety of research assignments in which the appraiser may participate. The most thorough effort to define some categories and report attributes to date was done by Anthony Downs of Real Estate Research Corporation, and his chart in the Appraisal Journal<sup>(4)</sup> suggested the matrix of contents and report classification in Illustration #1.

#### H. The Appraiser - Playwright or Critic?

At this point the appraiser may well ask if the definition of feasibility does not imply that he is the creative genius assembling the project under analysis rather than simply the economic critic of a project conceived and planned entirely by someone else. The position of



the real estate analyst in the creative process of developing a project can be compared to the various levels of involvement in preparation of a Broadway play. An appraiser is trained to be a neutral observer and interpreter of the crowd in the lobby after the first-night performance when it is too late to affect the box-office results. The analyst of feasibility is more in the nature of constructive critic invited to the out-of-town trials by the producer. He is permitted some involvement in terms of redefinition of character, conflict and dialogue. However, it presumes the critic has some technical standards with which to judge the format and execution of the drama unfolding. The moment that the analyst imposes his artistic impressions on the drama he has been transformed from critic into artist at work and his critical statements are no longer to be trusted. The constructive critic at the out-of-town trials may probe the playwright's intent with questions which will help the playwright perceive his own characters and plot, thus serving as a foil for discussion but he dare not collaborate in the rewriting of the script lest the critic become co-author. In this role of detached involvement in the decision-making process, the professional training of an appraiser is both an asset and a liability.

The appraiser is trained primarily to observe what "has been" successful rather than what might be. "Highest and best use" must be reasonable and non-speculative, but some shrewd analyst saw Disneyland as "feasible." Chances are that analyst was not an appraiser. Professional training and data collection about real estate matters is the appraiser's prime advantage in performing feasibility studies while traditional patterns of appraisal analysis are his prime source of inappropriate conclusions as to feasibility.

First, market comparison justification stresses historical satisfaction of needs rather than opportunity for satisfaction of unmet needs. If two-bedroom apartments have no vacancy it infers that more two-bedrooms at that price are not a bad idea but what of those families who did not find a four-bedroom apartment? How many did not rent the two-bedroom apartment because it lacked a carport? These are the questions that properly answered provide the best profits rather than average profits. Highest and best use studies search for that class of improvement which can bid the most for the land. Most reports of this type avoid the more realistic question of choosing the optimal plan for a given type of development which will maximize developers cash returns, minimize his own investment and/or financial risks, and fit the merchandising strategy appropriate to the then current market. With increasing and decreasing returns to scale, financial risks relative to scale, and holding power of the developer, the most satisfying or successful improvement may be distorted from the premise of appraisal theory to favor the requirements of pragmatic business standards.<sup>(5)</sup>

The definition of market value does little to encourage the appraiser to study the profile of buyers and sellers because the basic definition of value presumes the classical definition of "economic man." First it assumes that both buyer and seller have equally desirable alternative courses of action available but the object of merchandising is to make the buyer believe no other equally desirable opportunity exists as an alternative. Nobody competes on price by cutting net profit if he can compete successfully on product differentiation. What may be

significant about comparables is the amenities which are not present which some segment of the market must have. For that matter appraisal theory presumes rational behavior on the part of the buyer and seller while much merchandising of real estate is calculated to encourage irrational behavior. At the same time many investors are not trying for maximum profit so much as they are for a minimum exposure to loss of capital and reputation or for intangible strategic gains of advertising image, self satisfaction, or captive markets for retail services, construction services, and other generators of income and business stability. The typical business motivations for monopoly pricing, for minimum exposure to loss, and for satisfaction of irrational needs of both buyer and seller are out of harmony with the conditions presumed in "fair market value" but very much in tune with a definition of what is feasible in terms of subjective satisfactions.

#### 1. Starting Point and Structure of a Feasibility Report

Remove the simple premise that a project is feasible if its market value exceeds its capital budget and then introduce a variety of non-economic factors in the measurements of success or "satisfaction" and no sense of direction, no recognizable starting point, or possibility of conclusion seems to be available. Feasibility studies seem unmanageable and conclusions unreachable when compared to the carefully defined methodology of appraisal. However, the analyst may proceed to chop the problem down to size in the same way in which the appraiser begins to focus on his appraisal problem by defining purpose of the appraisal, the definition of value, the date beyond which information is irrelevant, the explicit exclusions, and the statements of limiting conditions and assumptions.

The analyst enters a situation requiring some aspect of research where the circumstances involve either:

1. A site or building in search of a user, or
2. A user in search of a site and certain improvements, or
3. An investor looking for a means of involvement in (1) or (2).

At the outset of his final written report and early in his analysis procedure, the analyst needs to specify in simple graphic form

or a short statement (similar to the page of "salient facts" which often introduces an appraisal) the following limiting conditions:

1. The viewpoint which he represents.
2. The critical objectives of the viewpoint represented.
3. The elements of the feasibility process provided by others and those assumed by the permission of the viewpoint represented
4. The elements of the feasibility analysis to be researched by the analyst.
5. Description of the decision model by which all elements can be synthesized into selection of a course of action or statement of a conclusion.

With the circumstances, the framework of available or missing information, and assumptions established, the initial thrust of thought and study are quickly limited by logic along the following lines:

1. If you begin with the site, begin with the attributes of the site because these will define the limited range of alternatives and constraints on its future use.
2. Too many projects are first designed and then the ultimate consumer is asked what he thinks. If you enter the process at this stage, the developer will propose, but the ultimate consumer will dispose so the essential premise to attack is the compatibility of project attributes, good and bad, with the decision criteria of the target consumer for which the real estate is intended.
3. If you begin with the need for a site it is necessary to define the static attributes and dynamic functions an appropriate site must possess and the weights to be attached to each for comparative analysis of alternatives.

4. If you begin with an investor in search of an opportunity, first determine the essence of his objectives and modus operandi plus those of his regulatory overseers to generate criteria that will suggest the limitations on any acceptable array of real estate alternatives. Attributes of the desired solution should bring to mind real estate deals which stress such features.

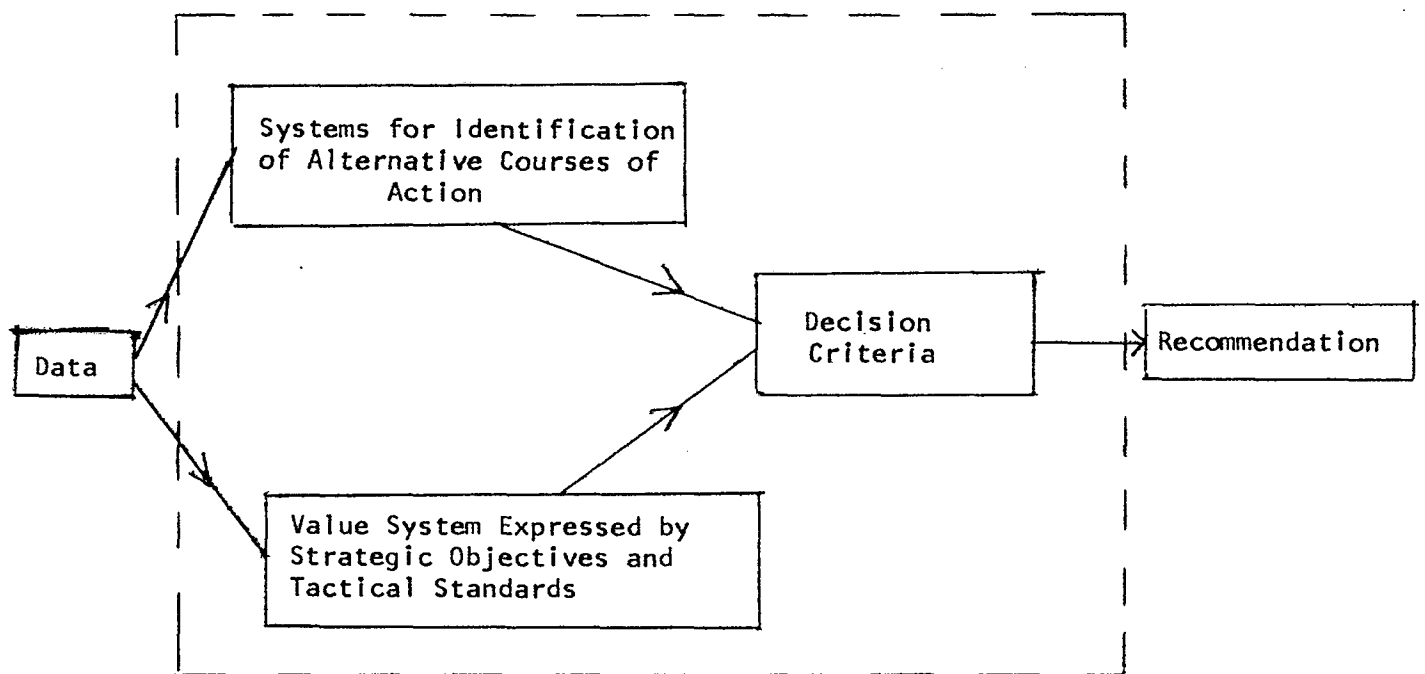
Perhaps the only element not familiar to the training and the good common sense of the real estate appraiser is the need to identify or create a decision model custom tailored to the problem, the available data and the fee. In appraisal the systematic process to arrive at a value decision is largely prescribed by theory; in feasibility analysis it is limited only by the imagination of the analyst and the facts of life as seen from the viewpoint which the analyst must represent and simulate.

#### J. The Value of a Systematic Decision Process

The components of the decision process will be suggested by the objectives of the client since it is satisfying or failing to satisfy these objectives which determine the success or feasibility of the project. The decision machine chosen with which to relate and synthesize tangible and intangible factors alike must serve the following functions:

1. Since there is an infinite amount of information about any project and its environments, the decision process should select only that which is critically relevant. The confusion created by excess detail as well as the time constraint and size of the professional fee requires systematic oversimplification.
2. Systematic simplification must be accomplished with an explicit statement of premises upon which forecasts of success or failure may depend.
3. While the basic framework of the decision machine is always the same the logical process can be executed in a manner improvised for each problem if one can understand the basic process.

Illustration #2



#### K. Four Steps to a Decision

The logical process of reaching a decision has been well described in a fast reading little book Design for Decision by Irwin D. J. Bross (Macmillan, 1953) and the basic concepts of this book have been adapted to this discussion of feasibility analysis. A decision machine can be diagrammed as in the Illustration #2. It consists of four steps or components: Facts (data), identification of alternatives, values and objectives, and decision criteria.

1. The first step requires collection and organization of a wide variety of facts and figures to identify or formulate possible alternative courses of action compatible with the facts from which one must be chosen. If a filling station is put on the site, it excludes the doctor's office but considerable information is required to identify and describe these possible alternatives. One alternative course of action which is often available is to do nothing. For the client to continue the status quo, factual information is necessary to see if the decision making would be permitted to do nothing. The efficient collection of information is possible when the standards by which the alternatives will be judged, the decision criteria, have been selected.
2. Alternative courses of action must be expressed in the form that permits the analyst to compare the likelihood of realization and the desirability of the results. Consider the classical decision machine of Coach Woody Hayes relative to the use of the forward pass; "Three things (alternatives) can happen, two of which are bad." The payoff on the third alternative changes with the strategic circumstances of the team and the completion average of the quarterback. Probabilities in real estate can seldom be statistical; instead they are intuitive judgments which may be expressed as the analyst terms a luxury apartment project, "a natural" or automatic car wash as "out of place." The possibilities for a successful result from the viewpoint of a specific client do strange things to the concept of "highest and best use" which assumes somebody in the market is willing to take the risk of loss for the maximum gain.

#### EXAMPLE #1

The sale of lake front lots might be 90% certain, while the success of a resort on the same site might only be 50% certain. Despite the higher profit on the resort, one might choose the investment that had the lowest possibility of loss rather than the highest potential for profit--the mini-max criterion that most businessmen follow.

EXAMPLE #2

If confident that the zoning board will approve subdivision plan 90% of the time and better than 80% confident of sales estimates, there is a 72% chance of the plan going forward as we expect.

3. Alternatives can also be arranged according to desirability or priority and maximum profit can be only one required desirable attributes. The limit of liability may be a highly prized legal attribute, along with freedom from a commitment of management time. In the ethical area of concern, the preservation of specific ecological qualities may supercede other considerations. Description of courses of alternative action in terms of their attributes to provide certain desirable features or stated possibilities for successful execution obviously requires some knowledge of the objectives and priorities and philosophical values of the client which the analyst must serve. If these are known first it is then possible to assemble the facts about alternative courses of action or consequences which are relevant to the attributes by which the desirable and probable criteria may be applied. Inevitably, therefore, feasibility analysis, that is, the measurement of the likelihood of satisfaction, begins with identification of what satisfies the client and the resources at his disposal with which to seek satisfaction.
4. The decision criteria by which the client may choose between alternatives reflect his objectives which in turn are specifications of general value statements. A planning agency may value public access to all major bodies of water in a given area and state its objectives to be ownership of 25% of all shoreline frontage on navigable water by 1980. This is a strategic objective which in turn provides tactical alternatives which might include outright public ownership, acquisition of scenic easements, conservancy zoning, land planning controls on subdividers and so on. Each of these tactics would generate decision criteria such as requiring a developer to dedicate a minimum of 20% of his shoreline frontage to general public access, requiring building setbacks 200 feet from the shoreline, prohibiting individual piers, etc. Notice values give rise to strategic objectives which may have alternative tactical methods of achievement which in turn suggest standards of acceptable or nonacceptable courses of action.

The creative function of the feasibility analyst is to understand the values, objectives, and alternative tactics of the parties at interest well enough that the analyst can invent methods of assembling



facts about these alternative courses of action or consequences which fit both the information available and criteria which apply the objectives and value preferences to a choice. A "decision machine" is only the careful and conscious application in a simplified model form of the methods by which we all make choices. It is a stylized model of behavior reduced to a point where it is capable of using available information to represent what is a dynamic process relative to real estate questions.

#### **L. Models and Creative Analysis**

It should be possible to create an oversimplified model of analysis for each component of feasibility analysis -- market trends, merchandising, the law, the ethical, the physical, and the financial. Modeling to forecast behavior or result is derivative of thinking by analogy, and the creative uses of analogy have been developed in a powerful little book, Synergetics: The Development of Creative Capacity, by William J. J. Gordon (Harper and Row, 1961). Models for forecasting are not new to the appraiser. The market comparison method models the steps a rational and knowledgeable buyer might take in applying the principle of substitution; the income approach oversimplifies the relationship of net income to value by the model  $I/C = V$ . Feasibility analysis generally requires the analyst to innovate his own model to fit the elements of satisfaction and alternatives at hand.

#### **M. Analysis by Analogy**

The Gordon book suggests conscious methods of stimulating creativity through the basic technique of making the strange familiar and the familiar

strange to gain simplification and perspective. For example in the introduction to this Sketchbook it was suggested that the vital ingredient of real estate is space, empty voids, and that the spatial utilities are manufactured from solid planes such as land and walls and roofs and invisible constraints such as survey lines and flight approach zones. By converting the image of real estate from physical brick and mortar in its familiar sense to the less familiar concept of space, one provides a link to questions of environment, movement of people and goods, and functional efficiency of structural forms. The mechanism for consciously developing this ability to reverse ideas as suggested by Gordon is the use of personal analogy, direct analogy, symbolic analogy and fantasy analogy:

1. Personal analogy to relate to a problem would be to note one's own resentment to noise from an adjacent apartment and assume tenants like yourself might place a premium on soundproofing.
2. A direct analogy would be to compare the flow of traffic to the flow of fluids which would tend to prefer moving downhill and to the side of the current, such as traffic crossing the potential "dam" of an intersection before turning right into a filling station.
3. Symbolic analogy might be found in a name, such as a resort motel called "The Abbey," symbolizing peace, quiet, a retreat from the city, dedication to service.
4. Fantasy analogy might be to analyze the attributes of a motor camper owner by reference to the restlessness of a gypsy caravan and concluding that one would capitalize on this characteristic by providing a chain of campsites, one with the romance of white river water, another with the seclusion of a deep woods site, another with the drama of rocky cliffs, etc.

The ability to associate a real estate problem with some analogous natural or mechanical process and to extend the metaphor may well

lead to creative perception and construction, and this type of thinking by analogy will be repeated throughout the Sketchbook. It is the basic tool of the good writer, the creative artist, or the intelligent analyst and the facility can be increased with deliberate practice.

#### N. Models as a Form of Analogy

Model building is a method of reasoning by analogy. Models are replicas of the real world to permit simplification for analysis and are of three types, physical models, abstract models, and symbolic models:

1. Physical models are objects like sand tables of the topography and architectural models which can be very useful in communicating the findings of feasibility analysis in matters of shape, sun and shadow, micro-climatology and siting questions.
2. Abstract models are graphic layouts such as flow charts of pedestrian and vehicle traffic, production processes, critical path network diagrams and so on which have great value both in visualizing a problem and communicating complex dynamic relationships. Even the physicist uses round balls and pipe cleaners to describe molecular structure.
3. Symbolic models use algebra-type statements such as  $(\text{Cash rent} = \text{operating expenses} + \text{real estate taxes} + \text{interest} + \text{principal payments}) \text{ divided by default point desired.}$

Symbolic models have great value for feasibility analysis both in organizing bits and pieces of information, identifying critical relationships which should be explored, and explaining to the client at the outset of the report the logic of the analysis. With more elaborate development, it is possible to create a mathematical model of whatever phenomenon is to be described, such as cash-flow after taxes over time. Unfortunately, the variety of relationships in a dynamic real world exceeds the capacity of the mathematicians, and so various shortcuts

are chosen to build a model. The creation of a model is not enough however; the model must survive repetitive tests in predicting alternative futures that may result. Thus, there is a constant interplay between mathematical models and available data for testing and application. Any model for feasibility analysis must always fit the data that are available if it is to be tested and then applied in future cases. Most of the millions spent in medical research is spent on collecting data with which to test a hypothesis-- a model. It does not cost much to think up a model. So it is in appraisal: most of the time is spent collecting information to fit the model of what an appraisal should be. So it is in feasibility analysis but unlike appraisal the analyst must also provide the model.

#### 0. Advantages of Analysis by Means of Models

Models are primarily useful when they prove to be good predictors, but models have additional advantages for feasibility analysis:

1. A model provides a preliminary frame of reference for analysis and failure of a model to predict may reveal information gaps not apparent at first.
2. Another advantage of model making brings into the open the problem of abstraction. An apple has an infinite number of attributes or properties in regard to size, shape, color, chemical composition. In deciding to eat it or not, only a few characteristics are considered -- worm holes, color, texture and height above ground on the bough. Some degrees of abstraction are necessary for decision.
3. Once the problem is expressed in symbolic language, one may simplify it by the manipulation of mathematics or publish a concise statement of the problem.
4. Models often provide the cheapest way to accomplish prediction as well as the fastest. The gross rent multiplier is a model of investor reaction to stream of rent dollars, a cheap and sometimes accurate decision tool even though its simplicity contains opportunity for error in application.

5. Models are subject to the usual dangers of abstraction, false premises, translation in scale, or infatuation of the model builder with his brainchild rather than reality. Criticism must always be directed toward the assumptions required by the model to be useful for a specific purpose.

Teaching feasibility analysis is a matter of teaching creative modeling techniques that are adaptable to the great variety of real estate projects which must be evaluated as to their capacity to satisfy the objectives of a specific client. Some basic simple models can be reapplied to these many cases through:

1. A process of enrichment--that is, elaboration of the very simple model such as that above for estimating cash rents required.
2. Analogy and association with a previously developed model such as applying retailing territory techniques to location of an office for an orthodontist.
3. Alternating attention to partial aspects of the total solution, such as relating a physical characteristic of the site to a merchandising technique.

With a little practice the technique of asking the right questions becomes a basic format for the interview with the client.

The analyst has only performed part of his function when he has answered the question, "is it feasible?" He is in the position of the attorney who was told by J. B. Morgan in a shout, "Don't tell me what I cannot do; you are paid to tell me HOW to do what I want to do!" Thus, the analyst begins with the need to specify the objectives of his client.

## CHAPTER II

### DEFINITION OF CLIENT OBJECTIVES

#### A. Introduction

Since feasibility analysis is an attempt to evaluate the degree to which a proposal or alternative proposals achieve some specific goals or objectives, to judge the fit (or feasibility) of the proposal it is necessary to specify the objectives. The analyst may be given a narrow and specific standard to test, such as a presumption by a lender that if the present value of the expected benefits equals or exceeds the capital budget it is reasonably assured of success in the hands of management of average ability. Just as often, however, the analyst will need to interrogate his client as to his strategic objectives and perhaps those tactical alternatives which may be open or acceptable. Objectives can be very broad, indeed more in the nature of loosely structured hopes or expectations, as in the case of reorganization of public land policy or increased production of low-cost housing. On the other hand objectives can be tightly programmed goals, i.e., a specific rate of return on capital or a production schedule which can be completed in 65 working days. In any event there is a hierarchy which can be developed around the concepts of values, strategic objectives, and criteria with which to judge tactical alternatives.

#### B. Values and Objectives

Since feasibility is a rational process for formulating and testing objectives, the following definitions and an example taken from a planning report of the Southeastern Wisconsin Planning Commis-

sion<sup>(1)</sup> will provide both the terminology and an example:

1. Objective; a goal or end toward the attainment of which plans and policies are directed.
2. Principle; a fundamental, primary, or generally accepted tenet to support objectives and prepare criteria and plans.
3. Criterion; a standard of comparison to determine the adequacy of plan proposals to attain objectives.
4. Plan (or tactic); a design which seeks to achieve agreed upon objectives.
5. Policy; a rule or course of action used to control plan implementation.
6. Program; a coordinated series of policies and actions to carry out a plan or tactical alternative.

The statement of land use planning objectives, principles and criteria, in Illustration #3 follow from a general value judgment that carefully planned land use will make better use of this finite resource than uncontrolled development. This general value judgment is given a more specific statement in Objective #1 and a rational guideline stated as a principle. For another example, a Board of Directors may value diversification to stabilize operations but may follow the principle of selecting areas of diversification that are related to basic resources and talent of the parent corporation. The profit objective may be given a criterion such as a rate of return on invested capital of 12% minimum after taxes. The Board may also value protection against losses and the surprise potentials of a venture and provide management with specific risk control policies having criteria in terms of maximum equity commitment, maximum liability ceiling, and default points, etc.

ILLUSTRATION #3

LAND USE PLANNING OBJECTIVES, PRINCIPLES, AND CRITERIA

OBJECTIVE NO. 1

A balanced allocation of space to the various land use categories which meets the social, physical, and economic needs of the regional population.

PRINCIPLE

The planned supply of land set aside for any given use should approximate the known and anticipated demand for that use.

CRITERIA

1. For each additional 1,000 persons to be accommodated within the Region at each density, the following minimum amounts of land should be set aside:

<u>Residential Land</u>	<u>Net Area</u>	<u>Gross Area</u>
Low density	250 acres/1,000 persons	312 acres/1,000 persons
Medium density	70 acres/1,000 persons	98 acres/1,000 persons
High density	25 acres/1,000 persons	38 acres/1,000 persons

<u>Governmental and Institutional Land</u>	<u>Gross Area</u>
Regional	3 acres/1,000 persons
Local <sup>e</sup>	6 acres/1,000 persons

<u>Park and Recreation Land</u>	<u>Gross Area</u>
Regional	4 acres/1,000 persons
Local <sup>f</sup>	10 acres/1,000 persons

2. For each additional 100 commercial and industrial employees to be accommodated within the Region, the following minimum amounts of land should be set aside.

<u>Commercial land</u>	<u>Gross Area</u>
Industrial land	5 acres/100 employees
	7 acres/100 employees



Illustration #3 continued

## OBJECTIVE NO. 2

A spatial distribution of the various land uses which will result in the protection, wise use, and development of the natural resources of the Region.

### PRINCIPLE

The proper allocation of uses to land can assist in maintaining an ecological balance between the activities of man and the natural environment which supports him.

#### A. Soils

##### Principle

The proper relation of urban and rural land use development to soils can serve to avoid many environmental problems, aid in the establishment of better regional settlement patterns, and promote the wise use of an irreplaceable resource.

### CRITERIA

1. Urban development, particularly for residential use, shall be located only in those areas which do not contain significant concentrations of soils rated in the regional detailed operational soil survey as poor, questionable, or very poor for such development. Significant concentrations are defined as follows:
  - a. In areas<sup>n</sup> to be developed for low-density residential use, no more than 2.5 percent of the gross area should be covered by soils rated in the regional soil survey as poor, questionable, or very poor for such development.
  - b. In areas to be developed for medium-density residential use, no more than 3.5 percent of the gross area should be covered by soils rated in the regional soil survey as poor, questionable, or very poor for such development.
  - c. In areas to be developed for high-density residential use, no more than 5.0 percent of the gross area should be covered by soils rated in the regional soil survey as poor, questionable, or very poor for such development.
2. Rural development, principally agricultural land uses, shall be allocated primarily to those areas covered by soils rated in the regional soil survey as very good, good, or fair for such areas.
3. Land developed or proposed to be developed without public sanitary sewer service should be located only on areas covered by soils rated in the regional soil survey as very good, good, or fair for such development.

C. Effective Presentation of Key Objectives

It should be possible to graphically represent the decision path by which available tactical alternatives can be tested as to the degree with which they fit the objectives and criteria of the client. As a method of report writing as well as problem analysis, the use of flow diagrams, charts, decision path networks or any other device for "scoring" a decision process cannot be overemphasized. Two different demonstrations are provided in Illustration #4 and #5. (For a fascinating philosophical discussion of the similarities between the graphical scoring techniques used in music, architectural design, land planning, and engineering see The RSVP Cycles: Creative Processes in the Human Environment by Lawrence Halprin (George Braziller, Inc., New York, 1969, particularly pages 122-169 on the development planning of Sea Ranch.)

There are a manner of devices for modeling the decision-making process for particular problems. Too often, the real estate appraiser resorts only to a checklist or standard topic outline provided in one-day seminars or basic appraisal. Checklists and resort outlines often require long verbal explanation whose relevance to the total problem is often difficult for the reader to grasp. What is needed is a preliminary screening device to focus more detailed investigation.

Relative to Illustration #4, consider an industrial development board which is attempting to decide which firms and industries it should circularize to attract new industry into a particular community or region. If one of its objectives is to attract industries which have a good prospect of growing once they are established in the area, one might first screen alternative possibilities on their recent past

## Illustration #4

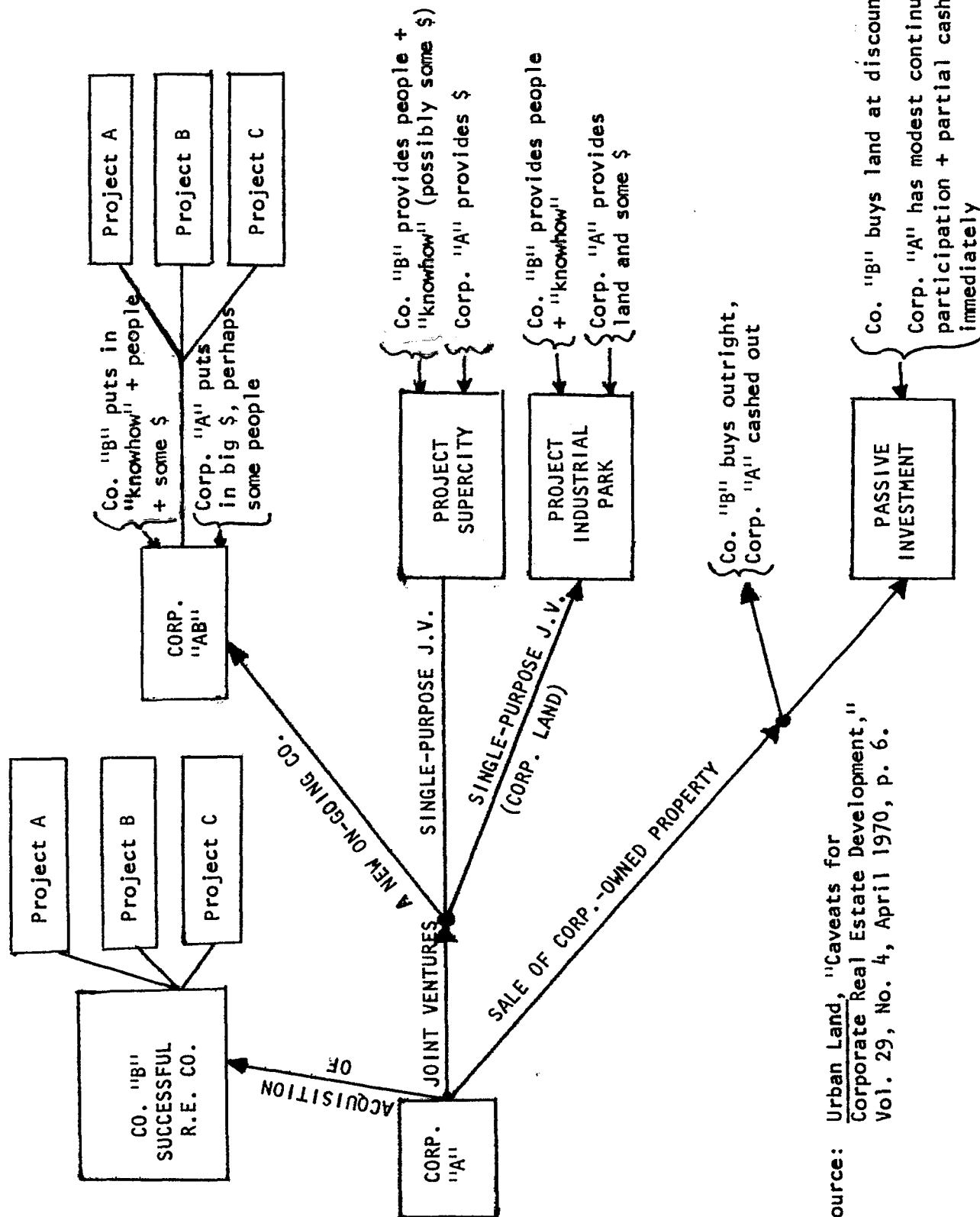
## THE SCREENING MATRIX

Criteria	High Growth, 1960-1975	Wages		Labor Intensive	Linkages			Labor			Materials		Markets		Total	
		Very High	High		Most in Region	Partially in Region	Most Links Elsewhere	Professional	Skilled	Semiskilled	Port Orientations	Generally in Region	Partially Found in Region	Regional		National
Industry 4-Digit SIC	Weight:	10	5	5	8	5	2	2	4	6	2	6	3	3	5	
2611 Pulp mills	X		X		X				X		X	X		X		38
2732 Book printing	X		X	X		X				X		X			X	42
2911 Petroleum refining	X	X				X			X		X			X		36
3541 Machine tools	X		X	X			X	X	X						X	33
3673 Electron tubes	X		X	X			X		X						X	31
3831 Optical lenses	X		X				X	X	X						X	28

Source: Urban Land, "The Systematic Approach to Industrial Development Research and Calculating the Profitability of Industrial Land Developments," Vol. 29, No. 6, June 1970, p. 6.

Illustration #5

DECISION PATH FOR CORPORATE ENTRY INTO REAL ESTATE DEVELOPMENT



Source: Urban Land, "Caveats for Corporate Real Estate Development," Vol. 29, No. 4, April 1970, p. 6.

and near future growth record, a criterion growing out of the objectives of continued growth which is generated from a value placed on dynamic economic base. To create buying power within the community it may be further decided that industries will be preferred with high wage scales. If there is a principle that industrial relocation is more easily accomplished where customers and supplies are nearby, then there is a premium for those industries which have most of their required linkages in the community or region. If the community has a port facility it may be possible to promote most advantageously among industries requiring such a facility. By weighing these desirable factors with a point system, and then requiring a certain minimal total point score for further consideration, it is quickly possible to exclude a majority of alternatives where the payoff in employment and income gains would be relatively unimportant. Assume the development board might examine any industry which scoring thirty-five points or more disregard the others. With this first cut, a new type of matrix might be applied relative to legal or labor problems or compatibility with environmental factors. The reader of a report would very quickly grasp the logic, which he could accept or reject, by which the analyst arrived at a conclusion as to the compatibility of a given course of action with the objectives of the scoring. The first step in making a choice is to eliminate all the alternatives which do not fit or serve the specified objectives. The second step is then to evaluate which of the remaining courses of action may best serve the specified objectives.

With some experience and common sense the objectives and the appropriate decision screening devices can be suggested by analyzing the key attributes of the three basic problem types, a site in search of a user, a user in search of a site, or a client in search of an opportunity. Identification of critical constraints permits oversimplification to provide an approach to definition of objectives and most likely courses of action to be studied, a method of thinking best illustrated by a few examples:

EXAMPLE #1: A Site in Search of a User

A modern cabin resort with a large acreage of wooded lakefront land had overbuilt its restaurant and recreation facilities relative to its cabin capacity. The resort provided a stable with hiking and riding trails, water sport facilities, tennis courts, and other capital improvements. The analyst was asked how the resort could use its long lake frontages to advantage when the cost of building deluxe cabins in the north woods was not justified by cabin rates for a 3-month season. The analyst could attack the problem by either discovering a cheap way to build cabins or find a customer for the advantages of the site who would bring his major capital requirements - a cabin - along with him. Note that by reversing the problem from the logical to the whimsical the analyst by analogy replaced a \$12,000 cabin paid for by the resort owner with a \$12,000 motor camper brought by the guest himself, a guest who could be presumed to afford the other facilities of the resort. Merchandising and financial feasibility studies strongly supported the concept but the owner feared a potential misfit or irritant in the fact that campers and cabin fans don't always mix, particularly if it were necessary to accept smaller pickup vans and trailer campers to maintain high occupancy. The solution was to place the motor camper resort on a point across the bay from the cabins but with a view of the main lodge and the tennis courts. This solution, however, reduced the strength of the linkage of the motor camper to the existing recreational facilities for lack of proximity. To increase the linkage and reduce the tendency of the motor camper to turn his engine and take his spending to other points in the area, the plan added a paid lake-side trail to connect the two areas, free bicycles, and a jazzy little paddlewheel barge to connect the two dock areas. First it was necessary to find a customer for the site with the necessary attributes to meet the constraints of the resort owner and then it was necessary to hold a mobile customer on that site to achieve one of the objectives, namely increased restaurant-bar-stable-equipment usage.

EXAMPLE #2: A User in Search of a Site

Economic feasibility is often both oblique in its standard of its success and largely defensive in its objectives. A paper company made its money producing paper for cardboard containers but to sell all the paper it could produce it was necessary to own and operate box companies to convert the paper for sale to the ultimate users. The marketing objective was to secure and then protect from competitive sellers those customers for boxes who used the largest square footage of container board. Within the typical trade area of a box plant it was possible to truck the finished product with little difference in cost relative to location. Therefore, the objective was to locate a box plant in a generally good market for containers in such a way as to maximize the square footage sales of container board. This economic fact became the screening device for the selection of sites. Within the proposed trading area the sales manager of the paper firm indicated the largest users of containers, both customers and potential customers. A number of specific customers obtaining only part of their container board requirements from the client were identified as prime merchandising targets and sites were sought that might be adjacent to these customers. A suitable box plant site was found contiguous to the best potential customer in order to sell more paper board. A conveyor belt from the box plant to the adjacent appliance manufacturer secured 100% of that customers paper box business by eliminating his need to inventory container requirements in his own plant. In this case the objectives produced a criterion of feasibility that was expressed as sales of "X" million square foot of paper board a year. The real estate man did not need to know the costs of constructing and operating a plant or the dollar sales volume to determine economic feasibility. Location was a matter of strategy while the addition of the conveyor belt was a tactical move to achieve the strategic objectives. A plan and a program would follow as a matter of implementation.

EXAMPLE #3: A Client in Search of a Real Estate Opportunity

A small insurance company client had located his home office on the corner of a large tract of land which had appreciated from \$1000 an acre at purchase to an average of \$12,000 an acre at the time of analysis. The company sought a feasibility analysis of a handsome apartment project which it proposed to build and operate on the site. The company thought it wanted a standard appraisal and market study to determine the economic merits of the project. However, an interview and interrogation of the investment committee indicated that investments of a growing insurance company would be judged as successful relative to some investment needs perhaps unique to the insurance company. The insurance company was turning to real estate because growth in the valuation of its stock portfolio had disappeared at a

time when it needed to manufacture profits and surplus for the company to underwrite their rapid growth in the insurance business. Insurance companies are legally required to expense all costs on a cash accounting basis while premiums received must be taken as revenue on a conservative accounting basis. For a growing company there are thus no prepaid expenses as assets to offset a growing reserve for premiums written but not earned despite payment of commissions and underwriting expenses with the result that earnings and surplus decline for the growing insurance company. To offset this there must be investment profits from sales or from permissible and automatic revaluation of securities in the marketplace. Relative to the apartment project in this case, simply building the unit would not necessarily bring any increase in the land account which would continue to be on the balance sheet at cost and in addition insurance regulation would require straight-line depreciation of the asset without regard to the market price. Insurance auditing formulas further provide for evaluation of a future schedule of payments to be received from a mortgage or a lease by means of present value discounting of expected mortgage or a lease by means of present value discounting of expected future return. Mortgage interest and net leases with proven averages are returns eligible for discounting valuation while equity returns are regarded as unreliable and valued at cost less depreciation.

In conversation with the client it became clear that the first objective was to recognize the great appreciation in land which had taken place and second to participate in the returns from the apartment house in a form which could be rediscounted from time to time as market rates changed. Another objective third in priority, was to acquire some management skills that could be devoted to development. These objectives quickly led to recommendation that they sell the land to a joint venture corporation and take back a participating mortgage which gave them an immediate sale profit and a contract cash return which could appreciate if participating shares rose with inflation or interest rates fell resulting in a regulatory adjustment downward of the appropriate discount rate for asset valuation. The investment returns in this form made the project feasible when simple straight-line ownership would not have been justified despite great economic demand for the apartments to be built.

Oversimplification of a problem to make it manageable means discovery of the priorities as well as the measure of success required in a statement of objectives. In all three examples everyone wanted to



make money, to make an adequate return on capital but the form of a feasible solution was different because the context of each situation was unique. Without discovering the context within which the client was operating the analyst could not make a meaningful statement about the best solution to the problem even where he could indicate the present value of the benefits would exceed the capital costs. Moreover, it should become obvious that with a variety of objectives and tactics available no one choice will be optimal. Real estate is largely a result of choosing a program (a combination of tactics, policies, and guidelines) which provide a satisfactory result under a given set of conditions.

D. Areas of Inquiry to Define Client Objectives

For the client in search of a real estate investment opportunity or as a method for defining the range of acceptable alternative courses of action, the analyst may find it advantageous to profile the business objectives of those from whose viewpoint the study is to be done. Profit making is too generalized a statement of objectives and profit maximization is always tempered by a variety of management preferences and philosophies, particularly in regard to business risk or uncertainty and personnel management. In addition each businessman may see the essence of his business as something much different than it appears. It is not uncommon for a restaurateur to see the preparation and serving of food as part of the entertainment business or theatre while a fast food manager may regard it as a manufacturing and materials handling process. An airport terminal building may be a valve for

regulating the flow of people, baggage, and vehicles while a retail store could be thought of as a stage-in-the-round for the display of merchandise. The developer of lake lots may see himself selling daydreams and proximity to home while the manager of a "swingles" apartment is providing social entre.

Each business enterprise will have an approach to risk management of possible static risk events such as fire or flood and dynamic risk contingencies such as introduction of a technically superior product or loss of a competitive advantage due to highway relocation, etc. Static risks may only cause a loss while dynamic risks have to do with profit or loss of entrepreneurial opportunity and economic competition. Growing out of their view of risk and the degree to which their plans have a conscious anticipation of the surprise potential, each business will have:

1. A preferred method of reaching its customers via high cost locations, lower cost real estate plus higher cost advertising, lower cost real estate plus higher transportation cost, or lower cost real estate and better values, and so forth.
2. A preferred method of maintaining supply sources and cost via standardized products, special bidding procedure, captive contractors, close supervision of low bidders, inspection controls on regular suppliers, etc.
3. Preferred scale of operation to achieve certain economies of scale, geographic dispersal, diversification of markets, or maximum cash equity for any one building project.
4. Preferred time line or length or business horizon as one business may prefer to complete any cash cycle within two years and to stress short term turnover of assets while another may be willing to take a 10 or 20 year viewpoint for the purchase of land or some other real estate opportunity.
5. Preferred methods of personnel recruitment, control, and motivation will affect the use of employees versus subcontractors, arrangements for a property manager, and business organization and legal framework to provide profit shares to employees.

6. Preferred static risk management treatment relative to property losses such as insurance for earthquake in Palo Alto or high tides in a New Orleans delta or riot and strike in a campus area.
7. Preferred method of meeting or controlling dynamic risks of competition in terms of location tactics, advertising, land use controls and other control strategy.
8. Personality attributes of decision making team that will be utilizing feasibility report.

Questions by the analyst of his client will tend to stimulate the latter as well as the analyst toward new thinking about real estate and permit some brainstorming of alternative courses of action. The analyst should not be overly critical of the first list of alternatives but rather should encourage development of a list of alternatives as long as possible. At the same time a strong business preference for a certain style of operation may preclude the most obvious solution or avenue of research.

## CHAPTER III

### MARKET TRENDS AND OPPORTUNITY AREAS

#### A. A Definition of Market Analysis

Market analysis is concerned with a reduction of aggregate data, such as population, employment, and income totals to factors which are relevant to the site, the merchandising target, or the client. Everyone recognizes the general significance of such information but it is often mishandled by the analyst who sledge hammers his economic points with masses of data rather than "counter-sinking" his arguments with well-sharpened facts. The reader in turn resents impressionistic economics which rely on endless listings of facts and figures to establish an inference of growth or market size, or good times! These abuses of data are in part related to the tendency to place this information at the beginning of the report as "background" and then to move from the general to the particular rather than working from the specifics of a site in search of a market, a need in search of a site, or the preferences of a client in search of a market to serve. Market data has application to the determination of:

1. Growth factors present in the general community or region
2. Geographic direction and momentum of real estate activity in a given locale
3. Favorable timing for development
4. Appropriate scale of development
5. General supply and demand for space units of a given type
6. Sensitivity of economic assumptions for community growth
7. Sensitivity of sub-market sought to economic base

However, aggregate data declines in significance as the analyst is better able to name his customer for merchandising purposes. For example,

for the developer who knows of eight doctors in town will need office space adjacent to the hospital, the value of the aggregate data about the town is minimal. It becomes increasingly necessary to talk about aggregate market data the less one is able to be specific about identifiable space users.

#### B. Simplification of Data Selection

There is virtually an infinite supply of statistical data with some tenuous relationship to real estate needs, values, and trends. Sharp analysis results from the editorial ability to quickly exclude or ignore almost all of this data for any one project. In short, the analytical technique for handling aggregate data is first concerned with devices for excluding most of the information easily obtainable and then refining selected bits to direct focus on the analytical problem at hand. The best devices for excluding information, refining data, and explaining the conclusions to the reader of the report are simple mathematical or graphical models.

The first control on the quantity and nature of aggregate data to be used in the report often lies within the three basic feasibility situations, a site in search of a market, a need in search of a site, or the preferences of a client in search of a market to serve:

#### EXAMPLE #1

A site zoned for high density residential in the center of a university student district will be influenced by various trends affecting the student and staff population and their choices for housing. As a state university the growth factor may be heavily influenced by state high school students going to college, and the per cent of these students expected to attend the school adjacent to the subject site. Economic base in the

college town or agricultural employment in the surrounding county is irrelevant. The analyst can eliminate the need to manhandle a great variety of traditional data types by choosing only those that focus on the primary economic characteristics of uses of the subject site.

#### EXAMPLE #2

A space need in search of a site might be a gasoline company with financial resources to build 100 stations in the next 5 years. The firm would prefer to place these stations in those communities with relatively high ownership of automobiles as a per cent of population, relatively high growth rates in population age brackets with high auto utilization (say to 16-60) and higher average distances to employment. With key aggregate indicators of gasoline consumption, it is possible to select a town preferred for new station construction. Merchandising data is then required to select the best site opportunity in each town. Fast food operators as with a gasoline retailers have computerized their technique and criteria to locate potential areas of opportunity from taped census data using statistical correlation<sup>(1)</sup> of those sales to commonly available data on neighborhood census tracts traffic counts, and pedestrian volume. The point is to choose available aggregate data that is correlated to demand or supply for a specific land use.

#### EXAMPLE #3

A client in search of a marketing opportunity is looking for some subgroup within a larger consumer group who is not satisfied with available alternatives. The key may be a pattern of remarks by those in a certain age group, with a certain hobby, or some other interest in common but it is then necessary to measure the possible size and amount of effective demand by reducing aggregate statistical data to a group of related submarkets.<sup>(2)</sup> For example student housing actually consists of a large number of diverse special submarkets. Classification of students by sex, graduate or undergraduate standing, married or unmarried, state resident or non-state resident, and preference for college operated or private operated facilities makes it possible to identify 32 separate submarkets. For example, one could analyze the housing need of female, graduate, unmarried, out-of-state persons preferring off-campus housing. When this was done at one university it was discovered the overwhelming majority preferred one bedroom units for two persons within a few blocks of campus. The study was applied to all 32 combinations of five binary classifications to discover the profiles of apartment rental submarkets in the university town. For a useful demonstration of subclassification of the housing market

by number of rooms, location, rent, and housing by price, number of rooms and neighborhood characteristics, one should consider purchase of Projection, a report available for each SMSA as a ten year housing forecast by W. R. Smolkin and Associates, Inc. of New Orleans, Louisiana. It is available from the builders service department of Barrett Division of Allied Chemical Corporation.

With a specific situation type in mind the analyst can then formulate a model with which to state the relationship of relevant data and to explain the exclusion of much seemingly related but inconclusive information. In general the economic relationship of data can be stated as a simple mathematical equation or outlined graphically as a flow diagram or logic tree. For a thorough demonstration of structuring aggregate data with a basic arithmetic model the analyst should read "A Systematic Approach to Housing Market Analysis," By Bruce Singer, Appraisal Journal, October 1967. To suggest the thrust of his essay consider his basic model for forecasting the demand for additional housing units of some particular type:

If for a given area, the warranted number of housing units at any point in time may be expressed as:

$$D = H + V_n$$

Where: D = Warranted number of dwelling units  
H = Number of households in the market area  
 $V_n$  = Allowance for a normal vacancy level.

It follows, therefore, that the warranted increase in dwelling units from some base year, b, to some forecast year, y, may be represented by the following equation:

$$D = (H_y + V_{ny}) - (H_b + V_n)$$

To reflect conditions of surplus vacancy, demolition activity, and units under construction at the time of the analysis D, the equation

may be adjusted as follows:

$$D = (H_y + V_{ny}) - (H_b + V_{nb}) - (V_s + C) + R_{b-y}$$

Where:  $V_s$  = Surplus vacant units

$C$  = Units currently under construction

$R_{b-y}$  = Anticipated demolitions during the forecast period.

The formula expresses, in literal terms, the warranted increment to the supply of dwelling units over a selected forecast period. Because the increment is calculated in terms of the growth in households, the warranted increase in housing space is identical to the additional demand.

The statement of the relationship by formula is easy enough; the problem is collecting and assembling data to fit the model, but at least the reader of the feasibility study should be told at the outset of the relationship or principles which dictate the choice and arrangement of data so that the report which follows has a thread of continuity.

Graphical methods of exclusion of data include definition of a primary or secondary trade area on a map by means of geographic and topographic boundaries, by driving time, distance factors or political boundaries. The market area remaining might be further subdivided into quadrants, or by land use of some other visual classification device. The data available in these boundaries must then be refined or modified to increase the probability and accuracy of its relationships to the desired forecast. A logical flow chart will combine selection of gross data with reduction of data discussed next.



C. Reduction of Aggregate Data for Better Focus

Generally the form in which aggregate data is available is not necessarily directly related to the demand or supply factors to be measured. The data which has not been excluded by the basic devices above or data which does not exactly fit the requirements of the model must be modified to increase the value of its contribution and the accuracy of forecasts derived. For example the article by Bruce Singer goes on to develop submodels for processing available data to fit the variables required by the general model. He found it necessary to modify total building permits per month with time lag factors to more accurately determine actual housing starts per month, as in illustration #6. Each step is an attempt to focus more carefully on the nature and character of the market place. Total increases in reported population can be very misleading about the need for housing until the time series data has been stripped of gains in the reported area from annexation, of increases in university enrollments housed on campus, or of those in age groups such as 0-9 or 70 and above, who may not be actively in the market for new housing, at least not housing already accounted for by other age groups. Most analysts have used this process in typical retail site analyses. In retailing studies the trade area is first, carefully circumscribed and then income data and purchasing power is determined in the aggregate for those remaining within the selected perimeter. Total income is then further reduced by various ratios to measure total family retail purchases,

ILLUSTRATION #6

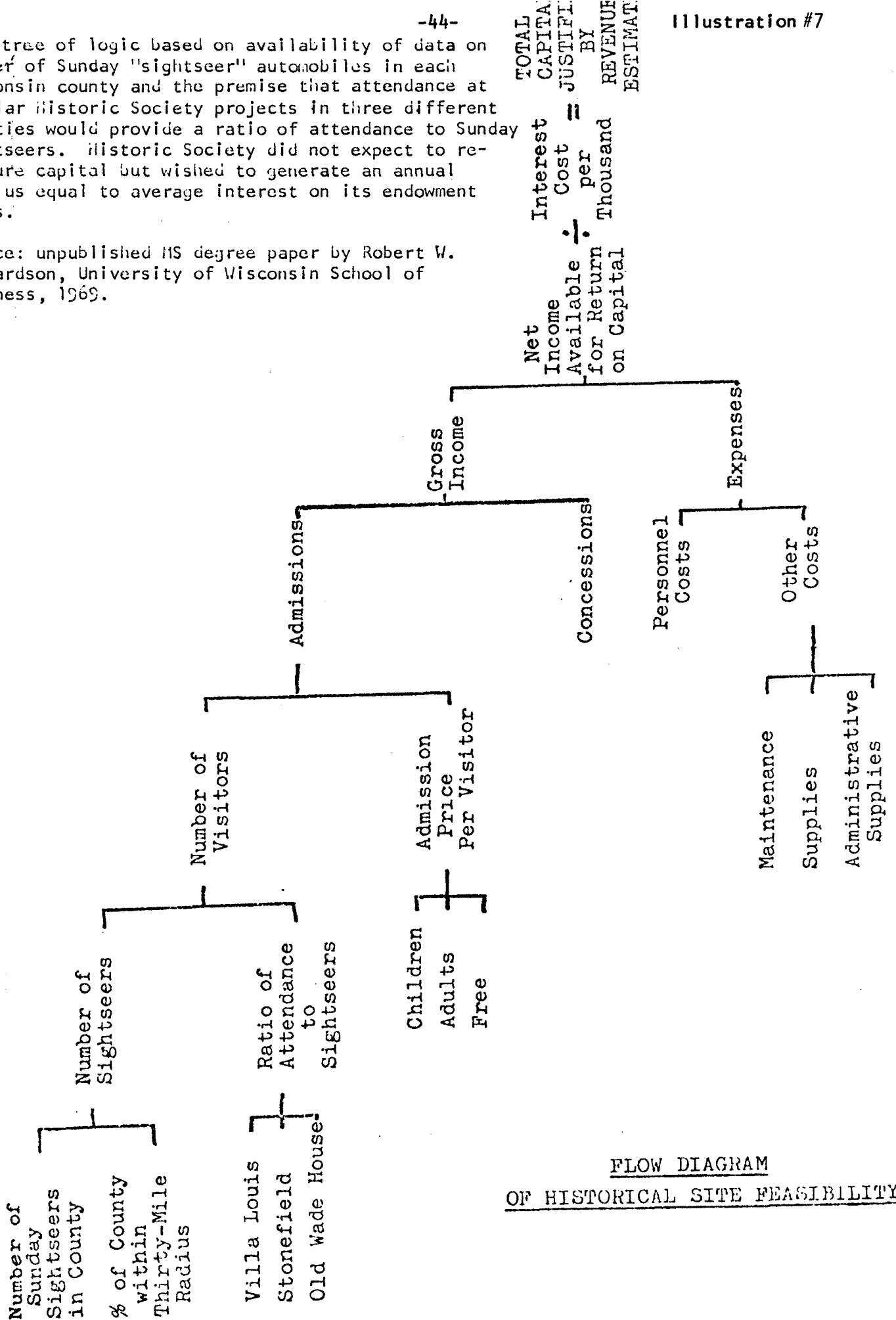
AVERAGE TIME LAG BETWEEN DATA OF PERMIT ISSUANCE AND HOUSING START

Percentage of Permits Becoming Starts					
	1st month	2nd month	3rd month	4th month	5th month
Single Family Dwelling }	65-70	15-20	5-10	5-10	
Multiple Family Dwelling }	40-50	20-30	10-15	5-10	5-10

Based upon a sampling of building permits issued in Los Angeles County during the months of January and July 1964. Subject to variation on a seasonal basis and by geographic region of the United States.

This tree of logic based on availability of data on number of Sunday "sightseer" automobiles in each Wisconsin county and the premise that attendance at similar Historic Society projects in three different counties would provide a ratio of attendance to Sunday sightseers. Historic Society did not expect to recapture capital but wished to generate an annual surplus equal to average interest on its endowment funds.

Source: unpublished MS degree paper by Robert W. Richardson, University of Wisconsin School of Business, 1969.



purchases within the trade area, purchases of a particular line of goods, purchases at a particular site, average sale per visit and so on.

The techniques of aggregate data analysis for standard retailing purposes can be adapted by analogy to all manner of real estate user problems. Consider Illustration #7 for the technique of using a graphic logic tree, the selection of the relevant aggregate data, and data reduction to focus on specific types of demands in this case for a historical site development project by a non-profit group, State Historic Society. The particular site was convenient to two interstate type highways and an earlier study for the State Historic Society had used the traffic count on these interstate highways as a basis for its demand forecast. Since most of this traffic was through traffic to resort areas in Minnesota and Wisconsin, the tremendous vehicle count was thought on review to be very misleading, i.e., lacking focus on the demand question. The Wisconsin Highway Department, however, has maintained road traffic counts on state and county roads by county and by planning district for weekdays and weekends. Furthermore extensive state studies have shown that the increment in traffic on weekends is explained by automobile sightseers using state highways and trunk roads for Sunday drives instead of the interstate. These drivers tended to operate within 30-60 miles of home and since the subject site was within 30 miles of points in several different counties of different population densities, it was necessary to adjust and add data by counties to arrive at the sum of sightseers in the

primary trade area. To determine the number of visitors at the subject site which would be generated from sightseers in the general area, it was necessary to reduce the aggregate number of sightseers by some ratio. Since the State Historic Society already operated three similar sites<sup>(3)</sup> in very different parts of the state for which attendance figures were available, it was possible to establish a range of ratios of actual attendance to county volume of sightseers using the same 30 mile radius method of computation and the same highway department data source. A ratio thus computed and adjusted for the urban proximity of the subject site was then applied to the number of sightseers to determine the number of visitors. The mix of adult, school age children and others of the three comparable historic society project attendance figures made it possible to compute an average admission price per visitor and therefore total admission revenue. The balance of the diagram should be self explanatory. The important point to note is that the model for processing aggregate data must begin with the form in which the data is available and the data which is most likely correlated with the demand or supply factor to be measured.

#### D. Impressions from Selected Data

Another device to control the amount of aggregate data included in the report is to review available data for some items which will best dramatize or characterize a point to be made. For example, it takes only one simple set of data to dramatize to the extent in which a community is vulnerable to employment changes in a military base

or in a group of related manufacturing firms within a single industry or on seasonal influences. Moreover, comparison of local unemployment rates or population growth or bank activity between communities can be highly misleading so that to include much of the time series data often requested by insurance companies and other institutional plants requires additional explanation of why these deviate from presumed standards of normality or are characteristically distorted for this particular community. The more incisive report is the one which provides the model which is relevant and then includes the data which is required by the model. Why provide all the available information and then edit within the report? Too often the analyst regards his function as the collection of a data bank rather than the selection and analysis of the data pertinent to the issue of feasibility in a particular situation. Data collection is clerical and if the report depends on inferences drawn by the reader from raw data collections then the analyst should be paid the wage of a clerk.

Often more important than statistics are attitudes within a local economy which may be suggested by political observations, such as:

1. The age and ability of the mayor and the size of the working majority on the council.
2. The frequency with which city bond issues have been approved by referendum.
3. The existence and attendance at graduate school facilities or continuing adult education programs.
4. The degree of respect for the electorate shown in the scale of services offered by city, county, and metropolitan planning agencies.
5. The proportion of annual city budgets allocated to parks, schools, interest on debt, medical programs and welfare programs as compared to police and fire protection, city hall payroll, and engineering services.
6. Average age and years of school completed.
7. Volume of non-residential construction for local service firms such as banks, local retail chains, and employment

- centers such as office and research parks.
8. Success of industrial development in land owned and merchandised by city or Chamber of Commerce.
  9. Indicators of progressive political unity such as local hospital consolidations, metropolitan consolidation of government functions, or success in state government decisions to locate some major state facility.

The population growth, employment, and income forecasted for a given part of the city can quickly be inferred by a knowledgeable reader when he is told that Sears, Penney's and Gimbels are building a million square foot regional shopping center and that other commercial retail construction is averaging so many million dollars a year in a given trade area. What more needs to be said about sophisticated expectations for the general area if one is analyzing filling station sites? If such a brief sketch of other investment expectations are indicative of the area, it is then possible to focus on more critical site considerations such as traffic counts for right turn lanes to the station, access points, and other particular specialties related to that land use.

#### E. Aggregate Data - A Merchandising Context

A characteristic of aggregate demand and supply data is that it generally represents factors that are beyond the control of the real estate entrepreneur. Except for the largest projects, the individual developer will have little influence on general levels of demand and supply although he must understand their nature and prepare his own programs with capacity to meet the surprise potentials inherent in these uncontrollable variables. On the other hand the entrepreneur

can adapt his real estate product, price and merchandising appeal to attract a smaller group of users with a particular behavior and preference pattern. Aggregate data may help to understand the effective demand characteristics of a particular usergroup but seldom does aggregate data provide the decisive identification of marketing opportunity. In our opinion market data plays only a supporting role to merchandising analysis of product, price and consumer and therefore the proportion of feasibility studies devoted to aggregate data analysis and its place in the report should be downgraded as merchandising data can be provided.



CHAPTER IV  
MARKET SEGMENTS AND MERCHANDISING TARGETS

A. Merchandising - The Drive Gear of the Cash Cycle

Real estate investment is a trade or business, for the most part,<sup>(1)</sup> and like any other business is a cash cycle - cash-to-raw material-to-inventory-to sales-to-accounts receivable-to-cash. Before committing to inventory a prudent businessman needs a clear idea of how a dollar invested will return in the form of sales, hopefully bringing a few more dollars profit as well. While market analysis deals with elements beyond the control of the real estate project entrepreneur, described as demand, competitive supply, and prevailing public attitudes, economic feasibility and success ultimately depends on the crucial fit of product, price, and merchandising appeal, all factors subject to development control, to the needs of a particular customer group.

B. Real Estate - The Natural Monopoly and the Competition Differential

The ultimate strategic objective of the firm within a free enterprise system is to create a monopoly to some degree either in fact or in the mind of the consumer. Nobody wants to compete as equals on price at the cost of reducing net after taxes. Since it is easier to corner the local market for canary seed than to corner the national market in grain, as a general observation development of a monopoly requires careful delineation of many small submarkets, learning much about a few users with particular economic, behavior, and preference

patterns. Dependency on a special submarket tends to insulate the enterprise from general supply and demand trends but magnifies the significance of critical profile characteristics of the submarket.

EXAMPLE #1

One national developer of luxury garden apartment projects first chooses communities in terms of five-year average of square foot construction of industrial and office space and then insists on paying whatever price it takes to purchase the last open area in an exclusive residential neighborhood with conditions as to his owning change. At that point he could care less about the supply and demand for apartments in general and the rest of the community and such data won't infer much about the feasibility of the project.

EXAMPLE #2

There is a supermarket chain which first locates residential areas which lack a high style supermarket. It then purchases or options all potential competitive supermarket sites in the market area, if possible, using the best for its own store and developing the others for other uses such as garden apartemtns or complementary retail space to eliminate competition for the potential food store market in the community.

Unlike many consumer products which require mass volume sales of a low priced product, a relatively small real estate product in terms of unit sales involves large scale enterprise. A 24-unit apartment building involves no less than a \$300,000 balance sheet and \$45,000 if gross sales (rents), considerably larger than most small business enterprises. Still it only requires 24 customers for one year leases to be sold out and probably no more than 12 new customers each year to occupy apartments as they become available. In a medium sized community of 150,000 persons there will be more than 18,000 apartment units so an apartment project of 100 units does not represent a major share of the market and in fact competes only with units

Illustration #8

- I. Location
  - A. Direction and distance from town center
  - B. Proximity to major shopping areas
  - C. Proximity to public transportation
  - D. Proximity to important employment centers
  - E. Proximity to other apartment projects in immediate area
- II. Structure
  - A. Architectural style of buildings
  - B. Type of structure -- garden, high rise, etc.
  - C. Size and color of building
  - D. Special uses of materials -- glass, etc.
  - E. Entrance description and name presentation
- III. Price Range
  - A. Monthly rental by type of unit
  - B. Monthly rental per square foot
  - C. Presentation of rentals in brochure and price lists
  - D. Utilities included in rent?
- IV. The Units
  - A. Appearance of halls and lobbies
  - B. Grade of appliances and fixtures
  - C. Square footage by room
  - D. Gas or electric cooking equipment
  - E. Location of entry
  - F. Closet space
  - G. Special features
    - 1. sunken living room
    - 2. washer and dryer in kitchen
    - 3. balconies
    - 4. tv outlets
    - 5. other
- V. Recreational Facilities
  - A. Exterior
    - 1. swimming pool
    - 2. tennis courts
    - 3. horse shoes
    - 4. other
  - B. Interior
    - 1. club house
    - 2. sauna bath
    - 3. organized entertainment
    - 4. other
- VI. Amenities
  - A. Type and degree of security
  - B. Services
    - 1. secretarial answering service
    - 2. in-structure shopping facilities
    - 3. other
  - C. Parking
    - 1. number of spaces per unit
    - 2. percent covered
    - 3. percent uncovered
- VII. Atmosphere
  - A. Density per acre
  - B. Relation of style to surroundings and community
  - C. Landscaping and relation to project
- VIII. Type and Attitude of Rental Agent and/or Resident Manager

Source: The Waiting List, Stanley Edge, Owens/Corning Fiberglas.

in comparable locations and rent levels in the city. Stanley Edge has well recognized these implications in his manual on apartment house research called The Waiting List . He distinguishes between the necessity of defining the competition in terms of the market standard, those attributes a project must have in a given rental class to be competitive, and identification of several features which could establish a competitive differential. Illustration #8 is his check list for defining the competitive standard while Illustration #9 suggests a graphical method of summary. The comments on each attribute specified for a competitive unit should indicate whether the feature is a must, is unique and apparently popular, or a frill which has little bearing on market acceptance. The competitive differential must be sought from clues provided by trade magazines, inspection of the most luxurious apartment groupings in town, or consumer surveys. In short he is advocating monopoly product differentiation through selection of a key competitive differential such as a fireplace, a carport, sound conditioning or other similar amenity (not gadgetry). Market analysis provides a description of the competitive environment and conditions beyond the control of the developer while the thrust of merchandising analysis is to discover the minimum elements necessary for survival plus the competitive edge which increases the likelihood of success which reduces the influence of the uncontrollable. The critical difference between demand, supply, and attitude analysis and product, price, and merchandising analysis is the difference between proving corn will grow in a soil as opposed to choosing the strain of corn seed that will thrive in that soil.

Source: The Waiting List, Stanley Edge,  
Owens/Corning Fiberglas

### Illustration #9

#### CHECK LIST ANALYSIS FOR DEVELOPING A MARKET STANDARD

CHECK LIST	PROJECT #1 (photo)	PROJECT #2 (photo)	PROJECT #3 (photo)	PROJECT #4 (photo)	PROJECT #5 (photo)	MARKET STANDARD	COMMENTS
<u>LOCATION ANALYSIS</u>							
Direction & distance from town center	n ne, 10 mi	n, 12 mi	n ne, 15 mi	e, 20 mi	e, 10 mi	ne quadrant 10-20 mi from center	primary method direction of growth
Proximity to major shopping centers	2 mi	1 mi	less 1 mi	4 mi	2 mi	radius 3 mi	important
Proximity to public transportation	adjacent	adjacent	2 blocks	1 block	adjacent	adjacent	important
Relation to important employment centers	5 mi	8 mi	6 mi	10 mi	15 mi	15 mi radius	not too important inside 15 mi radius
<u>STRUCTURE</u>							
Architectural style	contemporary	contemporary	traditional	contemporary	contemporary	modern-contem	very important
Type of structure	garden	garden	garden	garden	garden	garden	no high rise acceptance yet
Size & color	2-story dark brick	2-story brick	3-story blue brick	2-story red brick	2-story wood red brick	2-story colored brick	2-story unusual colors imp.
Special materials	lots of glass	glass					
Entrance & name	brick wall large logo	small "watch tower"	none	"wishing well" well done	contemporary sign lots of color	imaginative entrances	must relate to architecture
<u>AMENITIES</u>							
Security	spot lights	lights	lights & patrol	lights	lights	lights	patrol not too important
Services	"7-11" shop	central TV outlet	none	bus to downtown	none	small shop	investigate
Parking	100% covered	80% covered	80% covered	50% covered	75% covered	75-100% covered	important

C. Identification of Revenue Unit and Prospective Space User

Precise and imaginative recognition of the true unit of revenue or name on the customer check or decision maker from which all cash flows is the key step to excluding irrelevant information and focusing merchandising analysis. If the University decides where students may live this highly structured artificial demand or cash flow can be redirected any time by a change in housing rules by the University. The point is the location decision may be made by someone other than the consumer. Here the technique of restating the conventional wisdom to make the familiar slightly strange, as suggested in Chapter I, can be useful as in the following examples:

EXAMPLE #1

A public auditorium generally receives its income by the event rather than per seat and the check is signed by the promoter of the specific event. Feasibility therefore first becomes a matter of how many events and potential events might occur in the community requiring the facilities in question and what is the distribution by size of audience for these events. It may well be that a single political rally per year requiring 12,000 seats is both a low rent payer and out of line with the more typical event attendance of 7,000, suggesting both the optimal size of an auditorium and the commercial thrust of its economic viability. A count of events and preferences of this procedure rather than population count may be the critical research need.

EXAMPLE #2

A lumber company wishing to raise the income of its forestry division may find it significant that it relates a dollar of revenue to an acre of forest. Income per acre suggests that there may be more financial impact for merchandising acreage for hiking or hunting than from subdividing a few acres for cottage building. Leasing 50,000 acres of woods to bonafide vacation clubs for \$10 an acre will increase the net income on 100,000 acres far more than the sale of 100 lots for a net of \$2,500 each after considerable development and capital risk.

### EXAMPLE #3

Too often developers think of merchandising a sq. ft. of office space rather than an office unit. The customer for the office unit is generally the local office manager but may be a corporate real estate manager so that it is possible to construct a profile of preferences reflecting the person who signs the contract rather than the more generalized specifications of corporate tenants in general.

#### D. Name the Customer to Know His Preferences for Product and Price

Accurate identification of the income unit will generally achieve some insight as to the customer. Prospect identification is the key to control of real estate risks and the likelihood of feasibility just as it is in the merchandising of cars, life insurance, or machine tools. The degree of precision and identification depends on the number of units to be merchandised. A 300 unit recreation garden apartment project will be directed toward several subgroups of varied professional and married status within a given age group and the employment rolls at certain job centers in the community may be the key to these groups. Learn where these groups live and it is possible to learn what they like and their key dissatisfactions. All other aggregate data is relevant only to the degree that it suggests the conditions under which the particular age group and specific subgroups continue to be employed and attracted to the area. Still the developer is playing a statistical game in terms of the eventual balance between the supply and demand of units for this relatively large but specialized market. On the other hand a small clinic building with space for 10 medical office suites need only find 10 doctors in town who need the conveniences

and luxury of new offices. The yellow pages of the local phonebook name all the doctors in town while the staff at the nearby hospital may focus the prospect list even further. Real estate sub-markets are so small it is generally possible to identify past or future customers for a real estate product by name and until naming the prospect, it is often difficult to say much about his preferences. Customer spotting can be done by means of a telephone directory, city directory, accounts receivable lists, license plate spotting, magazine mailing lists, and tenant rosters.

#### EXAMPLE #1

A particular site in search of a user which could afford high rent per square foot with a low personnel density indicated potential for luxury apartments. Census data indicated the highest income people tended to live in three specific neighborhoods in Madison, all single-family homes. The street map indicated the streets and street numbers that lay within these neighborhoods and the reverse telephone directory indicated their names. Obviously not all of these home-owners were candidates for apartment living and so the current city directory was matched against the directory of 15 years earlier to increase the chances that those remaining on the list were now tired of home maintenance of closer to retirement. To those remaining a questionnaire printed in the style of a blueprint generated a 50% response and confirmation that the site under study was on the wrong lake and in the wrong location. The likely prospects were already retired and preferred linkages to their social group rather than the political-employment center of town.

#### EXAMPLE #2

A study of need for downtown office building began with rosters of surrounding buildings and the discovery that most apparently competitive buildings were partially occupied by their owners who had expansion plans. As leases expired tenants were to be moved out to make room for the landlord operations which included two banks, two utility companies and an insurance corporation. The rosters named the customers for the new rental building and the facility was planned to accommodate a group of prospects who in many cases did not know they were about to have a need.



It was observed earlier that one objective of analysis is to identify devices which can safely exclude the mass of easily available information as well as devices for selecting the relevant demand and competition of data. The best editorial device for excluding data and for measuring the fit of the real estate proposal to the space user requirements is to have a profile of space user behavior patterns, their preferences, their means to pay and their decision systems.

Merchandising real estate space is a retailing operation. While the retailer doing a volume in a mass market like Sears Roebuck is interested in national market factors like effective demand and public attitude, the success of the local store outlet depends on the knowledge of individual buyers as to price, product, and preferences of a segment of the total market. Feasibility analysts serve in the role of department buyer in a retail firm and therefore the merchandising of the real estate space can be made analogous to retailing research, particularly definition of trade areas, buying power, location strategies, and product feature.

#### EXAMPLE #1

Using the tenant roster of several apartment buildings with similar locational features as a site in search of a market, it was possible to identify where the people worked and therefore the pattern of jobs relative to residential location. This pattern defined a primary trade area for the apartment neighborhood just as a primary area for a supermarket might draw a ring around its prospective customers.

#### EXAMPLE #2

A profile study of those who have bought lake lots in the past two years by means of a mailing to names taken from a register of deeds office in selected counties or selected recreational plats

established the primary market for lake lots within two hours driving time and the secondary market area within 4 1/2 hours driving time of any particular second home development. It further established the acceptability of advanced cluster planning to buyers and the fact that the majority bought on impulse without shopping alternatives. As a result the developer focused on sale upon the first visit and seldom followed up on those who visited but who did not buy.

#### EXAMPLE #3

A suburban office strip provided a clue to office tenant submarkets in the case of a building on a wider than normal lot. Rather than exceed normal depths for office space from outside wall to corridor, the architect opened up the center of the building into a long narrow atrium with skylight above and a reflecting pond on the lobby floor level. The building rented first while others were vacant and only then was it observed that all of the tenants were in businesses in which the client visited the professional as opposed to the professional circulating among his clients. The architectural excitement of balconies instead of corridors, a stream of sunlight, and a soothing pond set the stage for the professional-client relationship that created a competitive differential for the building. The building was unwittingly sensitive to a need of a special submarket of office tenants.

#### EXAMPLE #4

Perhaps more useful than information about those who did rent or buy competitive space is information about those who did not. One major builder of luxury apartments sends his primary questionnaire to those who sign the guest register at the model apartments but never returned to see if he can pinpoint the source of dissatisfaction. Should their response indicate the kitchen was cold and uninteresting, the developer immediately redecorated the model kitchen with warm colored counter tops, perhaps a textured cork screw, and rosy lighting and then observes how money potential tenants units lease following the change and again inquires those who did not.

The techniques of trade area determination, customer spotting, and customer profile and market penetration studies regularly used by store location specialists are readily converted to the merchandising of all types of real estate space by naming or locating his customer

the analyst can make rather concrete assumptions which convert space users to revenue units, product specification, profit centers and net income, and thereby financial feasibility. The best guide to store location research methods and therefore feasibility merchandising analysis is an anthology, Guide to Store Location Research, by William Applebaum and Curt Kornblau (Reading, Mass.: Addison-Wesley Publishers, 1969). Richard Nelson in his classic book, The Selection of Retail Locations (New York: McGraw-Hill, 1958) has identified the most common points for a potential misfit of an enterprise relative to the context of its location and its market as follows:

1. Adequacy of present area potential.
2. Accessibility of the site to the trade area.
3. Growth potential.
4. Business interception.
5. Cumulative attraction.
6. Compatibility.
7. Minimum competitive hazard.
8. Site economics.

This book is must reading for any feasibility analyst together with the previous Guide to Store Location Research for a rich combination of feasibility problems. Retailing principles have been adapted to a variety of fields such as Guide to Selecting Bank Locations (New York: American Bankers Association, 90 Park Avenue, New York, New York, 10016, 1965), or Restaurant Site Selection Seminar (on Cassette tape), from Restaurant Executive Institute, 405 Lexington Avenue, New York, New York, 10017. A basic reference text

on the construction of various types of developments which should be required reading for all feasibility analysts is Community Builders Handbook (Urban Land Institute, 1968: Washington, D.C.) which is loaded with mailing addresses of trade organizations for the great majority of land use specialties with which the feasibility study may treat.

#### E. Obtaining a Profile of the Space User

To test the merchandising advantages and disadvantages of a specific real estate proposal, it is necessary to accept a profile of anticipated space user subgroups from previous surveys or to develop primary data from a survey conducted by the analyst. Surveys of special real estate users have been done by Universities, State Development agencies, local planning agencies, or private firms investigating other projects at a previous time. The various trade organization and franchise firms have completed profiles of prospects or computed ratios for reducing aggregate data to expected transaction volume and net income for a variety of land uses. Some outstanding work in consumer analysis and conversion of marketing data to real estate revenue has been done recently by:

1. Owens-Corning Fiberglas with Stanley Edge (The Waiting List) has developed a manual for apartment house research and tenant profiles for apartment tenants, townhouse dwellers and single-family home buyers looking toward purchase of another home (see bibliography).
2. Barrett Division of Allied Chemical has done several "how to do it" books on developing market plans for home builders and apartment builders, authored by W.R. Smolkin.
3. Michigan State University School of Hotel, Restaurant and Institutional Management offers a series of excellent manuals on motels and recreational property under the guidance of professors Robert W. Macintosh and C.A. Gunn.
4. U.S. Savings and Loan League together with the American Marketing Association Occasional Paper #5, Local Housing Research Techniques and Data, Chicago, 1965.
5. University of Michigan Consumer Studies, Survey Research Center, Ann Arbor, Michigan.

Where the analyst cannot find a usable prospect profile, he can do his own survey research. While it is important to structure

such studies to some extent, too much importance and mystery has been generated for textbook statistics. Too many survey statisticians are insensitive to side comments of the respondent. In a survey of railroad commuters to downtown Chicago, the statistics showed clearly that people tended to disembark in the morning at several stations near the loop but the majority much preferred to board the train in the afternoon at the Randolph Street Station. A comment in the margin of a single reply gave the reason "why" however, it was impossible to obtain a seat for a ride home unless a commuter boarded at the outset of the run at Randolph Street Station. To attract commuters to a building on railroad airrights, it was therefore very desirable to have several trains begin at the station to be incorporated into the major office building contemplated. Very structured questions in which the answer is "yes-not" or \$10 or other specific choices are easy to answer and to process in statistical form but it is often difficult to detect the degree of intensity with which the respondent holds his opinion for the value judgments behind his preferences. Prospective attitudes nevertheless are critical in determining product and price.

For a good primer on how to do survey research, particularly for preferences and attitudes, the analyst should use the paperback edition of Survey Research, by Charles Backstrom and Gerald Hursh (Evanston, Illinois: Northwestern University Press, 1963). The survey procedure consists of identification of a group to be surveyed which may be representative of a special group of space users, a decision to use mail, phone, or a personal interview, preparation of questions, and then tabulation and analysis of the response.

Once the analyst has begun to define his primary trade area or prospect group it should be possible to create methods for naming potential customers from which a sample may be surveyed. The more accurately one can focus on the source of potential customers, the higher the rate of response, as those most interested in the subject matter are most likely to respond and participate. Even a small number of respondents can provide useful results. For example, 200 replies will produce an error factor of about 7% 95 out of 100 times while a response of about 350 questionnaires would improve the probability of the error estimate of 99 out of 100 times. The key and often the most laborious part of a survey is building a list of names of prospects.

#### EXAMPLE #1

To do a survey of families using cabin resorts it was possible to distribute the questionnaire to guests from a sample of resorts in various counties either at the time of the checkout at the end of the vacation or on the dinner table near the end of the weeks stay. To eliminate embarrassment for the respondent or the resort operation, each questionnaire was given a stamped envelop addressed to the University. It was found the best response was had when they were distributed at the dinner table, possibly because by the end of the week the family had run out of table conversation or was feeling blue and introspective with the last day of their vacation having past and needed distraction.

#### EXAMPLE #2

Attitudes to a condominium parking ramp for downtown businessmen were surveyed by compiling names of all the business owners indicated on office rosters, financial institution officers, and government officials whose salaries were above a specific dollar amount. Financial officers names were taken from newspaper financial statements while public officials were neatly listed for the state and city in the reference libraries for each.

### EXAMPLE #3

To explore the market for upper-middle income apartments it was necessary to phone all the apartments which had been built in the previous three years to learn other rent schedules. Those which represented the upper range for Madison were then used to provide addresses by which tenants were identified in a reverse street directory from the telephone company. Return mail envelopes were keyed to the apartment complex of the respondent by the type of 6¢ stamp placed on the prestamped return envelope and the survey produced not only invaluable information as to the major deficiencies of competitive units but in addition identified two complexes as the major source of tenants for the proposed project.

### EXAMPLE #4

In a survey of motor-campers it was possible to obtain the cooperation of several trailer dealers by having them mail the completed survey package to their customers from the previous year and by sharing the results of the questionnaire with the dealer. In this way they did not have to part with their customer list since they did the addressing and mailing and at the same time several questions were designed to help the dealer rather than the developer of several motor-camper parks for whom the survey was done.

Another key element in determining the number of type of questions is a judgment on what needs to be learned or confirmed by means of a survey that cannot be learned or supported from some other source. It is here that an outline model (like Illustration #7 ) of the feasibility process can be revealing, for the analyst can quickly see that most of his time will be spent finding ratios with which he can focus aggregate data on the problem. It is relatively easy to define a primary trade area and estimate gross income within the area. There are federal studies which define what percent of gross income is spent on food and related household products by various family income groups. However, it is more difficult to say how much of this potential is spent inside or outside of a particular trade area and what per cent spent

outside the trade area would be shifted back if there were an appropriate retail facility. Moreover it is critical to know with good precision what sales volume is being done by each competitive alternative in order to estimate the per cent of market penetration required of the new proposed outlet. Further ratio analysis can convert the sales figure to required store area, service areas, parking areas and hence required lot area. The conversion of general demand figures to specific sales estimates and project specification requires progressively more accurate assumptions as to prospects, preferences, anxieties, requirements and responses. National chain operations or existing local businessmen have the best chance to observe and measure the retail profiles of their business to provide these key assumptions for future business sites. It is the new idea or the developer without a business generator of appropriate consumer information who must resort to a "cold turkey" survey. The following quotes from Backstrom and Hursh suggest some of the guidelines appropriate to the construction of the questionnaire:

1. "The ideal questionnaire treats four basic types of questions, each intricately related to the other; questions of fact, opinion and attitude, information, and self perception."
  - a. Fact questions, ask the respondents to provide information about themselves, their social and personal characteristics.
  - b. Opinion and attitude questions, seek to determine what the respondent thinks or feels at a particular point in time about a particular subject.
  - c. Information questions, are used to find out what people know, how much they know, and how they happen to know.



- d. Self perception questions: Here the individual is asked to evaluate something about his own behavior in relation to others.
2. "The ideal questionnaire is one in which all but a few questions are highly structured so that the respondent cannot deviate wantonly from the intention of the question."
3. Ambiguity questions that are exact in their meaning are much easier to grasp and respond to correctly than those that are incomplete, imprecise, or indefinite.
4. Misconception words that lie outside the respondents' experience have no meaning for him. Misconception of words also occurs where the writer violates idiom. Custom has shaped much of our language usage--grammatical or not. When a question is worded contrary to the respondents' expectations, they are likely to respond nonetheless, in terms of their expectations.
5. Loading: The atmosphere in which a question is asked must be neutral. A question is loaded when something in the question suggests to the respondent that one particular response is more desirable than another.
6. "The order in which the questions are asked may determine whether the questionnaire is successfully completed and returned, and whether responses to questions are adversely affected by earlier questions. The model questionnaire is designed in four parts; the introduction, the body of the study, and demographic questions."

Sample questionnaires can be found in materials prepared by W.R. Smolkin, Owens/Corning Fiberglas, and the National Association of Home Builders listed in the bibliography.

One discouraging factor to survey research is the fact that many hours of prospect identification, questionnaire preparation and expense, and patient tabulation of response finally boils down to a few relatively small charts and figures. A carefully done survey may cost several thousand dollars and reveal that:

1. No more than 150 present home owners in high income areas are ready to consider a return to an apartment.
2. The apartment should be located near a certain lake and contiguous to the respondents present neighborhood.
3. In addition to more typical features it should offer a fireplace, a walk-in closet with size enough to replace the attic, and an individual entrance. Living room should be open glass which cannot be seen by any passer by and walls should be impervious to sound.

So what? Was it worth a \$3,000 survey? Assuming one could capture 20% of the market with the right product, 30 apartments at \$400 a month means a long-term business grossing \$150,000 a year and requiring more than a half million dollar investment. Best product in the acceptable price range means a monopoly position relative to competitive alternatives and far more certainty as to which alternative outcome, happy or unhappy, which the investor may expect. Even fire insurance may cost 1% of the property value per year!

A survey may confirm what was known intuitively or reveal an unexpected misfit of critical importance in the design proposal fitting the project to the market.

#### EXAMPLE #1

The survey of commuters for a Chicago Loop office project above Illinois Central tracks revealed that on that railroad the majority of passengers were middle management or clerical people with favorable preferences but no say in the decision of the lease of office space for their employer. Following the principle of looking for the consumer who signs the check, a second survey was done by spotting license plate numbers of higher priced cars turning off the Outer Drive and passing the subject site on the way into the Loop. Of more than 500 license numbers, at least 200 were leased automobiles or owned by a national corporation, indicating the selection process was reaching upper level management. Mailing to those who personally owned their cars provided an excellent response and revealed that these key management people were parking in or within half a block in covered parking of their office. The proposed building project which expected to attract some of these tenants was designed without integral parking

facilities and two blocks from covered parking. How does one induce an executive who prefers to drive to sign a lease for space in a complex which makes no provision for his car? This drastic misfit between the design and the decision-maker profile meant the project was not feasible regardless of hypothetical financial profiles or office space absorption rates in Chicago. Both surveys referred to above meant a total cost of less than \$5,000 and yet uncovered the critical flaw in a project contemplating construction of 700,000 square feet of space.

#### EXAMPLE #2

A survey of motor-campers was accomplished by distributing questionnaires and stamped return envelopes to campers found in state parks and private camping grounds in a given area within 45 minutes driving time of a subject site in search of a market. The overwhelming majority of respondents desired well marked hiking trails in preference to any other specialized recreational activity, apparently because the majority of new camper-trailer owners were neophytes in the woods or the children were too young to always be near the water or fish from a boat. The second most important clear preference was for a swimming pool rather than a sand bed lake! Apparently most children had learned to swim in pools or parents felt there was better control in terms of the boundaries of the water play area. One thing the subject site had was acreage, and acreage with snowmobile trails connected to further trails in the contiguous county forest. A competitive differential had been identified. Another design feature proposed for the subject site was a honeywagon to pump out sewage retention tanks of visiting trailers daily as a substitute for a sewage collection line. The survey of camper equipment, revealed, however, that sinks drained to the ground while retention tanks were only for toilet bowls. Thus a honeywagon did not solve the problem of dirty dish water soaking into the pad and this potential design misfit was eliminated in favor of a standard mobile home sewer line hookup.

There was a time when the small developer might build a dozen units for the rental market at a time or the developer would specialize in a single type of property. With time and operating experience he corrected his mistakes until he found a combination of location attributes, building features; and management policies that eliminated the great majority of his irritations, misfits of product and prospect,

and optimized his profit relative to effort. And then he just repeated the same formula which he had derived from his experience, and working with small batches there was ample opportunity to adjust the form of the project to the slowly changing context of the marketplace. But real estate development today is no longer an unconscious small scale folk art but involves large-scale development of 100 to 1,000 living units or hundreds of thousands of square footage built according to specifications virtually fixed by financing, zoning, and contracting arrangements prior to development. If product and price do not fit the preferences of prospects at the start, it is most difficult to modify the project after the fact. How can there be a design without a well-focused prospect profile, a specification of what is required to meet the competitive standards and what provides the best opportunity for achieving some elements of monopoly by means of a competitive differential? The appraiser trained to seek the market by reference to existing "comparable projects" is well prepared to define the competitive standard without consumer surveys. However, is the appraiser prepared to identify and confirm the nature of a possible competitive differential? When demand exceeds supply the competitive standard is sufficient to produce an average profit, but in good times or bad, a few well-selected competitive differentials will provide the best profit to be had and the strongest assurance of "likelihood of success" which is the essence of the conclusion that a project is feasible.

## CHAPTER V

### LEGAL-POLITICAL-ETHICAL CONSTRAINTS

#### A. The Legal-Political-Ethical Tie

Real estate is more highly regulated than any other form of private enterprise including public utilities. Alternatives must fit the constraints imposed by law (1) on the site, (2) on the enterprise to be located on the site, (3) on the mortgage lender, (4) and by those regulating the investor. The analyst is not expected to provide legal opinions, but must at least request the client to identify major regulations relative to real estate to be observed. The analyst can be expected to anticipate the more common requirements of mortgage lending. As to constraints imposed on the site and improvements by zoning, deed restrictions, existing liens and leases, the analyst again can be expected to ask questions, request opinions, or identify critical issues requiring administrative application of the laws. A legal point may be pivotal in the issue of feasibility and must never be assumed away by the analyst as may be appropriate in appraisal. What is feasible is therefore what is permissible within administration of the law or obtainable within the realm of politics. Since the outcomes in both the law or politics are sensitive to the spirit or ethics with which the ground rules are observed, what is a feasible or satisfactory outcome may depend on what is considered an acceptable ethical standard by the client. Thus the elements of law, politics, and ethics are considered together in the chapter although treated individually in a feasibility report.

## B. Legal Constraints on Use of Site

The real estate professional is well aware of restrictions placed on land use by both public devices and private agreements.<sup>(1)</sup> For the initial pre-programming study the feasibility analyst can be expected to note the existence of those constraints which are well defined and to raise questions for study in depth by the appropriate legal or engineering specialist if prospects warrant further study. To specify what constraints exist is largely a factual matter but analytical judgment is often required to interpret ambiguous terminology and to discover which apparently fixed legal points might be modified by negotiation and the basis for such negotiation.

### 1. Public constraints on land use to be reviewed:

- a. The official map for the area, if any;
- b. Master plans for the community, the county, and the regional planning commission;
- c. The prevailing attitudes and biases of those responsible for administering the above master plan;
- d. The 5-year capital budget for metropolitan improvements;
- e. Zoning classification and its options;
- f. Building codes, procedures, and file on existing improvements, if any, including outstanding liens for violations;
- g. Subdivision ordinance, if applicable with schedule of platting procedures and agencies having jurisdiction;
- h. Highway department access controls;
- i. State Industrial Commission codes as applicable;
- j. State and Federal easements for avigation, scenic easements, shoreline control and bulkhead lines, and restrictive covenants under urban renewal, surplus property, or foreclosure deeds.

### 2. Private constraints on land use require a review of:

- a. Private covenants and time features running with the land;
- b. Control provisions administered by home owners associations, merchants associations, or tenant committees.
- c. Outstanding licenses and easements or implied easements;
- d. Existing leases and life estates;
- e. Mortgage lien and board liens with restrictions on use or reuse;
- f. Requirements of income tax strategy;
- g. Requirements of certain real estate tax procedures and exemptions.

In any particular case some of these public or private constraints will restrict ownership options and will serve to quickly narrow the preliminary scope of inquiry. After careful research these can serve as devices to exclude irrelevant considerations and much related data. The balance of these constraints need only be researched as tentative solutions are found to other requirements of feasibility, which then must be fit to the remaining context.

C. Legal Constraints on the Space User

Since the enterprise to be located on the site may not be the viewpoint from which the project is analyzed (a tenant versus the investor), it is important to recognize the constraints placed on the merchandising of space by the public and private elements affecting occupancy noted previously or by others who influence strongly the space user. For example, in Wisconsin the branch banking law specifies that new state banks be at least 3 miles from any other state bank or that drive-in facilities cannot be more than 1500 feet from the related bank location. These distances can lead to severe restrictions on locating the desired facilities on the available site as the prescribed distances must be measured with great care and accuracy to avoid legal injunctions generated by an aggrieved competitor. Most non-residential uses may be affected by State Industrial Commissions or others concerned with "safe place" statutes. Food operations may be regulated by the Board of Health and gasoline distributors by the Fire Marshall. Franchise operators may have to meet certain requirements in terms of their franchise while those in communications must be responsive to the

Federal Communications Commission. Even public agencies are subject to odd constraints imposed by other agencies as in Wisconsin statutes establish that a city cannot lease surplus land or air rights above municipal parking lots!

Even in residential real estate prospective tenants must consider policies of their "guardians" or sponsors of assistance programs. Student housing may be indirectly controlled by University approved housing standards and various welfare programs may prescribe acceptable minimum and maximum housing amenities. These types of controls are highly artificial, subject to arbitrary modification, and potentially dangerous to specially designed buildings and their investors. A policy set by a parent corporation, University Regents, or legislative whim can become pivotal in defining the adaptability of real estate attributes to meet a given need. Often these elements are carelessly ignored because the analyst has not carefully identified his prospect or the real estate profile of that potential space user. These kinds of regulatory boobytraps will receive ever greater attention in a decade when many will seek indirect public regulatory method<sup>c</sup> to accelerate social, environmental, or economic priority goals without direct tampering with private contracts or private property. It is far more effective reform to restrict the demand side of land use economics than to legislate and enforce specification on the supply side of the real estate industry.

#### D. Financing Constraints on Land Use

Most real estate projects must be tailored to meet the land use



standards required by the preferred source of financing as well as the minimum local requirements for regulatory approval of the land use. For example, zoning controls may permit a given maximum density of dwelling units per acre which would significantly exceed land use intensity controls on multi-family projects<sup>(2)</sup> receiving federal loan guarantees. Even conventional lenders have both regulatory standards to observe and preferred transaction guidelines imposed by underwriters on every detail from loan size to construction specification, lease provisions, and financial ratios of pro forma statements. Either the analyst must test a project against the lender standard most likely to be applied or must receive explicit permission to assume that the details provided by the client will meet or can be modified to fit investor specifications. Certainly in preprogramming of a project or in identification of reasonable alternative courses of action the analyst is not expected to "nitpick" the underwriting manuals but the basic screening techniques of the lender should bear on the project. For example, if the local savings and loans are requiring an overall capitalization rate of at least 12 1/2% and using the mortgage equity method, it is pointless to make a loan application on a pro forma statement suggesting a gross multiplier of 9 as the application will not survive the first screening of the morning mail. If certain lenders require that rezoning must be completed before the loan application is submitted, the achievement of rezoning becomes material to feasible available lending sources. There was a time when the property owner probed for free financial analysis by submitting half completed

plans for loan consideration in order to have benefit of patient critical analysis by loan officer professionals. Under current money market conditions the project should be substantially correct in all of its appointments and programs for the first submission lest the owner lose his credibility and his access to the short supply of credit monies available. Since real estate success eventually hangs on the ability to finance, preferences of investors become a major portion of the context by which "likelihood of satisfaction" must be judged.

Today the equity investor and the mortgage lender are difficult to distinguish due to the variety of hybrid financial arrangements that prevail. Both are concerned with meeting basic business controls on limit of liability, required specifications of a desired tax status, procedures for solutions of joint ventures or liquidity, low silhouettes on public relations matters in potentially sensitive issues, and conformity with parameters established by regulatory agencies. Investors can be stymied by those enforcing corporate charters and security sales, interstate land sales, utility commissions (does a limited profit utility have power to develop limited dividend housing?), fair trade laws (when does a building materials-land development-home construction firm begin to control the market and reduce competition?) or a transportation commission (when does the investment in industrial land by a transportation service company fall under review by those setting tariffs?). The feasibility analyst must request that either he be provided with a list of critical legal constraints by his client be judged feasible until someone else has fit the project to its proper legal context.

"And if Americans are no longer as convinced as they were forty years ago of the self-evident truth of Cal Collidge's epigram - "The business of America is business" - recent soundings of public opinion show that they are ever more widely convinced of Ted Sorensen's inverted epigram - "The business of business is America."

In the same sentiment the American neighborhood city is no longer to be a collection of individual real estate investments with zoning used as a device to be manipulated by the property owner. Instead real estate operations must be subordinated to city building and community values must prevail. The business of city management and planning is no longer to service real estate but rather it is the business of real estate to serve the community. It follows that the professional broker, appraiser, or analyst is obligated as an objective and educated citizen to comment on the compatibility of a real estate proposal with community standards and expectations, project occupants and to a lesser degree with project associates. The expansion of tax base without increased school enrollment is not always the ultimate criterion representing community values and objectives.

Since feasibility is a comprehensive question of the fitness of a project to its total context, the written report should recognize that what is technically legal at any given time may not be what is politic or ethical. While the analyst may wish to avoid an express or implied ethical judgment upon his client there are several alternatives which can be explicit:

1. At the outset of the study the analyst should either receive permission to identify in his report the appropriate legal-political-ethical constraints or specify the absence of such analysis in a statement of limiting conditions and assumptions.

2. If feasibility depends upon achievement of rezoning, the analyst should require the client to writing to state that the study should either assume zoning change or measure the probability and desirability from the community viewpoint of such a change.
3. Where the existing zoning is subject to a real possibility of an adverse change in zoning, there would seem to be an equal obligation upon the analyst to identify this portion and to measure its likelihood (as in a case where controls will be placed on wetlands development and the project in question has been accelerated to avoid a subsequent expected restriction).

Here is a serious issue inherent in moving from the appraiser who may value 'what is' and the professional analyst who is asked to measure a proposal against some standard of his own devising as to 'what might be.' The appraiser with his designation should not use the title, "feasibility study" to avoid the objective review implied by a certified appraisal report and to become an advocate for the project of the client. The professional appraiser is expected to be an advocate of only his professional opinion. Ethics committees of professional societies face interesting questions of performance standards where misleading advocacy for financing or regulating purposes is cloaked by report titles which presumably alert the reader to the fact that it is not an appraisal. In Wisconsin the real estate broker is more and more being held accountable for the misrepresentation of silence as to known public or private restrictions, conditions in the premises, or defects in the title or public administration. If a real estate salesman may be liable, is the far more professional appraiser and feasibility analyst legally safe in remaining silent regardless of who is paying his fee?

## CHAPTER VI

### PHYSICAL-TECHNICAL CONTEXT OF REAL ESTATE FEASIBILITY

#### A. Attribute Analysis

The physical attributes of land and improvements are well known to the professional undertaking a feasibility study, and need not be developed here except to the degree that they provide an insight to other issues of feasibility analysis or require proper utilization in the final report. There is a school of creative thinking which finds that through breakdown of physical properties of a material problem comes a breakthrough to perception of a solution. Study of each individual attribute provides opportunity for free association of ideas and concepts. For a review of physical property analyses, for a variety of land use types the Community Builders Handbook (Urban Land Institute, Washington, D.C., 1968) is recommended. For measuring the fitness of a proposal to its site and environs it will be useful here to distinguish between static physical attributes, dynamic site attributes, and the product to be merchandised. The static attributes are physical facts which limit the utilization of the site or provide opportunities for creating the competitive differential. Dynamic attributes of a property are its linkages in time and space to potential users, their environmental response, or behavior. The product is the sum of attributes consciously selected for merchandising or for neutralizing through design of improvements.

#### B. Static Property Attributes

Static attributes of a property are best incorporated into a

feasibility report in summary form only by reference to the work of the engineer, the geologist, or other technical specialists for two reasons. The first is to avoid smothering with too much data the decision process by which the issue of feasibility is determined affirmatively or negatively; the other is to provide credibility and responsibility for the factual technical assumptions. For the problem situation in which there is a site in search of a market, analysis begins with an inventory of the static and dynamic attributes of the site; for a market in search of a site the selection is governed by a specification of the required or desired static and dynamic attributes.

One function of preliminary analysis of the physical attributes is to aid the process of data exclusion and identification of alternative courses of action, a role suggested by the following comments on common static attributes of real estate:

1. Size and shape may identify the need for a particular market target. For example, a triangular site of one client would permit construction only of a 10-story cylinder with less than 5,000 net usable feet per floor and 35 underground parking stalls. High cost of services per floor would require high rent per square foot of usable space, while limited parking meant low density occupancy. Proposed solutions were a luxury apartment building or telephone company exchange facility or old existing buildings refurbished.
2. Topography can no longer be presumed reshapable to most any use due to the wonders of civil engineering. The analyst would do well to reverse the conventional wisdoms (to make the familiar strange) by first judging the project on how well improvements have been reshaped to fit the topography. Such care pays dividends in lower costs, in higher merchandising appeal through visual interest, as well as in conformity with the environmental ethic of the 70's. For example, access to a small subdivision was in close proximity to a sandstone quarry. A modification of the proposed plat put the entrance in the quarry providing a dramatic entry

framed by a sandstone cliff, eliminating a lot unable to qualify for septic percolation, avoiding a potential nuisance for children, and reducing development costs as well for the standard plan which expected to backfill and thereby conceal the quarry.

3. Storm Water Drainage can be converted from a land consuming vacant swale to a highly merchandisable pond. Owners of some well situated acreage were appalled to find the city would condemn the center of their commercial plat for a storm water holding pond for gradual release of area drainage into an existing and inadequate storm water interceptor. After both parties were staggered by before-and-after appraisals presuming economic ruination of the site, an analyst suggested creation of a lagoon and fountain maintained by the city and surrounded by a circular drive. The office park would then face a unique and desirable feature where none existed before and the land was given free in exchange for city commitment to build and landscape a pond and land owner agreement to provide a fountain for aerating stagnant water and for day-long esthetics.
4. Springs, Watersheds, Lakes and Ponds are extremely delicate resources in declining supply and of increasing value economically and ecologically. The analyst of land economics must be sufficiently informed on water resources to raise the issues inherent in lakefront development, artificial lakes, development of high water recharge areas, and the geology of water tables relative to fill sites, waste disposal, or platting. The wholesaling of lakeshore lots may be permissible and outstandingly profitable but is it feasible if cottage construction and myriads of piers destroy the visual appeal of the lakeshore and corrode the water quality? Advanced land planning techniques clustering cottages perhaps 200 feet back from the waters edge, community piers and anchorages, and preservation of wilderness have been proven to fit both the ethical dimension and the merchandising requirements for holiday property. The failure to provide a total feasibility analysis including ethical concern for land and water as a resource generates a totally erroneous conclusion that the conventional is financially feasible when it does not successfully satisfy the objectives and meet all constraints including those of community concern.
5. Soil and Subsoil may be the first question to ask in regard to subdivisions. Soil conservation service data are only appropriate for surface soils, and the issue of feasibility is not served by simple introduction of a limiting condition

on subsoils unless the analyst is explicitly permitted to do so by the client. The feasibility analyst is expected to probe the question of 'will it work?' rather than appraise it under assumed conditions.

6. Utilities must be analyzed by somebody, if not the analyst, for type and adequacy to the needs of the client. The client must specify minimum capacities required, provide engineering technical assistance, or explicitly relieve the analyst of responsibility. A conclusion that a certain land subdivision is feasible when soils will not support septic tanks, sewer is unavailable and there is no outlet for on-site treatment plant effluent is a fraud.

#### C. Dynamic Property On-Site Attributes

Dynamic property attributes are those which arise out of the interaction of people and place and might further be subdivided between people on the subject site and those off-site with some relationship to it. People make values by their density, attitudes, behavior, economic decisions and responses of all kinds and there is an interaction between physical form and human response which is barely understood. For background reading in this subject area consider a fascinating book, The Hidden Dimension, by Edward P. Hall (Doubleday, Garden City, New York, 1966).

From the standpoint of people on or within the subject property as a space user or visitor there is an endless variety of interactions to be considered, functional items or attitude items which may be classified:

1. Functional layout is concerned with the physical activities which will be housed, including flows of people, materials and equipment. Apartment design relative to furniture arrangement and circulation pattern is a common example. (1) A medical clinic building may be designed around the flow of patients, doctors, preparation procedures and paper work flows. Many of these things may be minor items on



which the project will not rise or fall but when an architect designs a modern clinic building, as one did, to fit a five-foot square module dictated by the esthetics of the sun foil, it forced doctors to choose between treatment rooms which were 5' X 20' or 10' X 20' and the building failed as a medical office building. The feasibility analyst should have faulted this proposal for lack of suitably dimensioned merchandise. Every building type has basic functional requirements which the analyst should prescribe (if not furnished by another) when providing pre-architectural programs or use as a standard of criticism for proposals put forward for "economic" analysis. The classic reference text on floor area requirements or other essential features and dimensions of building types is the handbook Time Saver Standards (2) and should be on the shelf of every real estate professional.

2. Personal response factors are a more subtle element of the functional characteristics of a property which are less important to the engineer but all-important to merchandising analysis since competitive differentials must be created largely by influencing customer attitude and response. There are few engineering monopolies on matters of functional layout. Monopolistic advantage is partially tied to elements of personal response by space users and are related to but broader in their import than functional engineering elements, and might be classified as follows:
  - a. Orientation to the sun and the micro climate of the site is a factor which will determine both the efficiency of heating and air conditioning and the glare or warmth and color of the interior. In northern climates apartment projects have failed because the only views were to the north over a frozen lake and no provision was made to allow the sun to reach the interior of the apartment. There are other modern buildings which have won architectural awards despite the staggering property management problem of apartments with all glass walls facing a western sun. If the feasibility analyst had been oriented to merchandise analysis instead of market trends and idealized pro forma income statements these mistakes would not have been made. (3)
  - b. Scale and texture have enormous psychological impact on the prospect as known by the appeal of red cedar mansard roofs, colonial patterns, wood paneling and other small pattern surface materials in apartment units to one time single-family home residents. Architectural techniques are very sophisticated in choosing motifs and proportions which will make a desired statement for the building owner but these must be carefully considered in regard to the merchandising thrust.

- c. Comfort is more than a functional matter of light and air and temperature for it is also a function of anxieties generated by security, privacy, or other visual depressants inherent in the design.<sup>(4)</sup> Consider how low ceilings may depress or create a sense of shelter. The triangular-shaped mail center has reduced walking in hot or cold climates distances and increased comfort of the shopper, thereby stimulating more frequent visits, longer stays, and more purchases.
- d. Security has in recent years become such a major factor in putting the space user at ease and protecting the property that it deserves special consideration both in functional layout and merchandising treatment. The glass wall staircase to discourage mugging or lighted halls in full view of the street are architectural common places. Still each special use has additional requirements such as the control desk in public entrances in a library or the multiple entrances for different types of occupants in the John Hancock Building. The analyst should make inquiry as to key security requirements necessary for a satisfactory achievement of objectives.
- e. Nuisances of sight and sound and smell can condition the space users and adversely affect the efficiency of activity within the subject site. There are luxury apartments with fine outside patios which are bathed in the sound of window air conditioners and thus little used by tenants and therefore ineffective as the competitive differential. There are modern office buildings improperly soundproofed which betray the confidences of conversations unless background music is continually provided as a kind of auditory guaze.
- f. Hazardous conditions are those which create explicit fears and anxieties either real or imagined as in the case of a high rise apartment well below the glide slope of an airport but enjoying a headon view of take-offs five miles to the south. The project was unsatisfactory as a result of this psychological misfit with dynamics of site context and consumer anxieties.

The feasibility analyst must simplify the problem of detail management by selecting those elements of functional layout and personal response which seem to have the most bearing on increasing or decreasing the likelihood of success of the project. It is then

possible to draw up a suitability matrix like that in Illustration #8

which was prepared for a land development project involving 3300 acres of land of all types and requiring a variety of recreational land uses. Maps of each condition when overlayed identified the areas appropriate for each land use and underscored a major problem in that the best and second best residential land were located at great distances from the recreational water resources. Each project will have its own matrix of physical attributes which are used to meet various constraints in each sector of analysis from strategic objectives to financial parameters. The project which best matches its physical attributes to its space users or occupants is the one most likely to succeed and therefore most appropriately designated as feasible.

#### D. Dynamic Property Location Attributes

The location features of real estate may be the most dynamic set of physical attributes relative to determining the likelihood of success. It is worthwhile however to look closely at the adage that there are three elements to real estate success "location, location, and location." A locational advantage may be the best form of monopoly merchandising but not the only form. The easiest way to merchandise may be to put the real estate where the people already wish to be but for non-pedestrian markets other competitive differentials such as advertising or amenities may offset the merchandising disadvantages of a less confined site at less cost. Location may be a functional requirement serving specific flows of people and

[illegible]

goods or it may simply be used to capitalize on existing personal response attitudes rather than to merchandise skillfully to overcome consumer habit and inertia.

The geographic location of a vacant lot has little economic significance without reference to some specific use for the site.

"Thus, it will be expedient to adopt the term establishment as defining the basic unit of land use consisting of ... 'individuals or groups occupying recognizable places of business, residence, government, or assembly ...' A retail store, a factory, an apartment building, and a single family dwelling are all establishments."<sup>(5)</sup> (A rich vein of analytical material on the dynamics of real estate location is Chapter IV of the text Real Estate Analysis, by Professor Richard U. Ratcliff; McGraw-Hill, New York, 1961.) Each establishment has a "packet of functions" which could each ideally utilize a different location. For example, the retail counter space may best be in the 100% block downtown while supporting storage space or shipping space could be located at much lower rents at the edge of town, the savings in rents being offset by interlocation transportation costs and loss of convenience. Without significant differences in net cost all functions may be housed downtown. The functions of each establishment have some interdependence with other establishments and people and utilities and flows of goods and services. These relationships are termed linkages and these linkages may be direct or indirect.

#### EXAMPLE #1

A direct linkage is a downtown store which has a bridge to a parking lot or a law office which does business in the courthouse across the street or the federal building nearby and the exclusive luncheon club on the roof of the law office building. Here there is a direct interchange of people and papers on a daily basis.

#### EXAMPLE #2

A more complex illustration of the dynamics of location is the siting of a motel to be within the drawing power of industrial plants with a national sales force during the business week and a large VA hospital for weekend visitors to patients at the hospital. The developer in this instance determines feasibility with half-a-dozen phone calls to determine the average number of stay-overs per night at these traffic-generators. The facility has since operated at peak capacity for years as it is located within the field force generated by half dozen terminal points for travelers despite the fact that it is far removed from major intersections, strong retailing centers, or more commonly recognized "tourist attractions."

The analyst must question his client and space user, or research the nature of people in the neighborhood, or learn the linkage patterns of merchandising targets to determine how a site can best serve existing needs. Aggregate data can be very misleading if it is not tested with primary research of its individual members. Certain streets on the way to commuting rail stations may have heavy pedestrian counts but as the individuals trudge from a train to work or hurry for the train and home, they are not in a mood for shopping although liquor and tobacco stores may flourish. A pedestrian count without some analysis and common sense could suggest far more retail potential than actually existed. The movement of people must be judged as to the frequency and economic or emotional significance of their desire to receive a service, to provide a service, and to deliver or obtain goods.

Related to the concept of an establishment as a packet of functions is the idea that the linkages of any one particular land use establish a geographic tributary area of linked establishments. The newstand in the lobby of a major office building is primarily linked to the offices in the building and perhaps weakly linked to pedestrian flows and the subway entrance outside the main door. Analysis of credit accounts of a floral shop showed 80% of its business came from two high income areas on opposite sides of the city and its business volume as well as its market position was enhanced when it relocated by creating a shop on each side of town. Linkages to a property are enhanced or weakened by a variety of responses to it by people off the site and these dynamic attributes may be designated and defined in the following manner:

1. Transportation access is the critical dynamic attribute in most cases. Save for billboards and transformer stations, people must reach the subject property to interact but access has several dynamic components:
  - a. Transportation mode may be by foot, bike, car, little plane, big plane, bus or train and possible ship or watercraft. The mix between modes may be important in determining critical parking requirements as well as the buying power of the space users. Registration of the appropriate vehicles is often an excellent way to name the prospect. Trends in transportation may also be a key element to forecasting market trends. The hotel which keyed on rail passenger traffic lost out to those which keyed on main intersections or anticipated interstate routes by a year or two. A marina on Lake Superior keyed on the railroad track to permit yacht owners in Chicago and Minneapolis to ship their boats north to cruise the Apostle Islands. It is important to know how your customers will arrive and therefore what they can afford. Public transportation routes will become more significant as public expenditures for urban systems in this country continue to grow.

- b. Physical access is concerned with the fact that proximity to markets is not access due to limited access rights of many parcels, speed of traffic, median strip controls, turn controls, etc. The number of access points is no more important than the capacity relative to the need and traffic engineers have a variety of standards as to the cars per hour moving in and out of various sized retail facilities, factory shifts, fast food stands, and the like. While car flows have been well studied less work has been done with pedestrian flows, particularly for retailing purposes where there are changes in grade, multiple stories or any other vertical move required of pedestrians. For example, Ghiradelli Square moves its patrons up or down the side of a hill with gradual changes in the terrace height using both ramps and steps and keeping the pedestrian always in view of the upper levels of stores. The Cannery however has been less successful in drawing shoppers to the third floor on a flat site by use of a clever glass elevator, an escalator, and a number of grand stairways set in atriums leading to their top line stores on the third floor. The combination of high style stores at the top and catchy vertical transportation systems has not been fully successful in moving people straight up rather than luring them in easy stages up or down a hillside. Analogy of access movements to fluid flows is useful in evaluating patron approaches to an establishment, particularly considering the nature of fluids to resist flowing uphill or to eddy around obstructions, etc.
- c. Travel anxiety or aggravation is partly related to safety and ease of physical access and partly related to attitudes generated by the approach zone. Speed or heavy traffic may discourage turns while a variable such as a stop light tends to draw people through the intersection when the light is favorable or to give time to think of turning while waiting for a red light. Filling stations on the right on the route home and on the far side of the light thus do the biggest volume. Decision time is related to other demands on mental concentration. The high gasoline sign on the Interstate may provide 60 seconds more decision time to check lanes, gas gauge, and priorities, and to slow down, thereby reducing the anxiety of a hasty move. Pedestrians may be deterred from crossing an intersection at the foot of a steep hill, a blind alley, or a gauntlet of old men sitting in a park. Often factors which create transportation anxiety must be found in trends such as expected traffic volumes on a new boulevard when it is linked to major arterials two years hence.



- d. Transportation costs money or time, and real estate is always a transfer point from one transportation mode to another which in itself is a cost in money and time. A drive-in window at a bank saves both a search for a parking spot, a parking fee, and a transfer from car to foot and back again. Real estate is always concerned with the ease with which this transfer can take place and with minimizing the cost, discomfort, and time required. Traffic engineers have techniques for forecasting long term costs of equipment repair or replacement, accident damages, injury rates and time costs of alternative routes. At the very best the analyst should consult early with city and state traffic planners.
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2. Exposure of site and structure covers a variety of attitudinal relationships between people and property. Exposure is usually a visual feature having to do with sight lines but it may also be accumulative impressions of the approach zone. The positive visual exposure of an office building at the foot of a traffic lane or a site on a hill or slope by a highway is well known. More subtle are the negative impacts of an establishment above the sight line of a pedestrian or a building which so impresses with its height it detracts from identification with ground floor activity. Consider how Rockefeller Center uses a small garden strip and the Center fountains to hold the eye of the pedestrian at street level and reduce the awe and chilliness of those narrow canyons between massive buildings. John Hancock Center uses a small plaza, flags, and trees as well as a white marble base to establish a human texture and scale on its mammoth tower pedestrian approach areas. A motel above a parking ramp is lost for lack of pedestrian and vehicle visibility plus the necessity of vertical access from street level to the plaza above the ramp. Good city planning utilized sight lines to alternate long views with surprises for the pedestrian or the vehicle operator. Attitude to a specific property is often influenced by the approach zone through which the space user reaches the property. A subdivision approached through a high grade neighborhood enjoys a more favorable reception than one of equal or better design approached via an unattractive roadway of older homes, ill-maintained businesses, or indeterminate vacant land. A well-designed apartment building for urban renewal in Cleveland failed as its primary traffic approach was through two blocks of structures scheduled for demolition but creating a visual barrier at the time of initial marketing effort to other urban renewal areas which had been reconstructed.

3. Tributary area analysis is a more elastic concept than neighborhood analysis for it is concerned with the specific establishments to which a property is linked. If a retail operation depends on residential units, it is important to note property tenure patterns, remodeling vs. resale and relocation, the stability or shift in age and number of school children. Workers in a particular neighborhood may largely depend on a volatile industry such as auto making or stable employment such as civil service. A wholesaler may define his tributary area to be many counties in several states and the wholesaler will be concerned with size and number of retail outlets, their inventory policies, and regional alliances. An improved highway network and larger stores may mean more long distance shopping by small town consumers and less need for large stocks by rural dealers. Economic prosperity for most may mean significant economic upset for a site depending upon a specific tributary support system modified by prosperity of the region. In our opinion a real estate study should move from specific site to a definition of tributary area by linkage analysis and then selected market data which bares significantly on tributary linkages. The tributary linkage analysis provides the logical tie or reduction factor between merchandising analysis and market aggregate trend analysis and specific relationships between aggregate trend analysis and specific property values when he insists on doing national and regional trend analysis first, before key linkages and tributary establishments have been defined in the report.

#### E. Property Merchandising Attributes

While the physical attributes of the real estate must conform to static constraints on the site and take maximum advantage of or neutralize the dynamic attributes of its relationships to others, the improvement within the control or discretion of the decision maker must have those attributes which best serve the merchandising thrust. The competitive standard may provide the minimum satisfactory product attributes and then the elements of competitive differential must be ranked by some cost-benefit scale. Financial parameters as well as good taste will limit the selection of differential features

to only a few of the options. These differentials should be selected from consumer interviews, review of trade magazines, and research of the special preferences of the lenders to whom the project will be submitted. Of course, each alternative package of differential features must then be considered relative to the initial capital cost, its impact on rents and prices, absorption rates, and long-term operating costs so that the financial advantages can be tested as discussed in Chapter VII relative to various financial indices of profit, risk, and solvency.

Differential features should always be selected with preference to items which have the most emotional appeal for the least investment. For example, a fireplace may have the initial capital cost of \$400 per apartment but may permit (in combination with other residential scale details) an additional \$10 in rent per month, or \$120 a year. Assuming the lender will provide funds equal to five times gross rent, the increment in rental power may provide additional loan monies of \$600 for an additional investment of \$400, providing both additional leverage and a more enthusiastic lender. Lenders tend to be enthusiastic about yesterday's ideas and so it is desirable to make a loan presentation of a new idea based on consumer surveys, thorough research of the competition, and illustration by means of trade publication feature articles. Designs which capitalize on views, the romance of trees and water, or visual references to upper income style items all create product values with minimum capital outlays.

The danger of selecting merchandising attributes without adequate profiles of those who are expected to sign the check are those of the implicit assumption or of the unforeseen contingency. For example, the assumption may be that if the developer cannot afford to build garages at least a carport would protect the finish of the tenant automobile. However, close questioning of the tenant would reveal that he really preferred to start his car on a cold winter morning and a garage kept it warmer and increased the chances of a quick start. Thus, it was determined that an outlet box at the parking stall connected to an off-on switch in a tenant apartment would permit use of an inexpensive "head-bolt" heater (or electric tools) with control of outlet use from his apartment. Such an installation is far cheaper than a pre-fab carport but directly on point relative to the needs of the tenant.

The surprise potential of the unforeseen contingency in product merchandising should be anticipated by an adequate capital cushion plus a product that is not inflexible in its use. Proper understanding of student housing markets structured by University regulations would have prompted risk control by installing utility chases to permit conversion of poured concrete dormitory buildings to efficiency apartments or offices. Product attributes must always be judged for both their dynamic merchandising power and their defensive holding-power over a long term of investment.

#### F. The Physical-Technical Attributes Summary

The attributes of land and improvements in terms of those existing, required, or desired, need simplification for presentation

in a prose report as well as committee meeting. By far the best method of presentation is the use of a matrix of attributes, specifically attributes which are not common to all alternatives. If alternative proposals for a specific site or property all fit the existing zoning, or deed restrictions or other attributes in common, these can be stated simply at the outset and the matrix reserved for differential factors among alternative courses of action. Each component of a feasibility study should have its own detailed matrix of analysis while the final conclusions and recommendations could be summarized in two chart-type or tabular summaries, one for the financial consequences of alternative courses of action and one for the qualitative differences between these same courses of action as in Appendix A. Less detailed strategy studies may be summarized in a single matrix as illustrated in Appendix B.

CHAPTER VII  
FINANCIAL CONSTRAINTS AND ALTERNATIVES

A. Range of Inputs for Investment Analysis

Real estate questions for both public and private investors eventually involve issues relative to management of long term capital assets. Analysis involves comparison of cost-benefit relationships of alternatives over specific time periods. For the investor in a government bond the capital outlay, the date of outlay, the coupon payment dates, the maturity repayment date, and the relative risks are all defined by contract or standardized investment services. The investor can compute benefits as a yield with four decimal places since all of the numbers required are supplied by the contract. Real estate seldom provides any fixed points relative to capital costs, scheduling returns, or size of returns and so these necessities of risk and yield comparisons must all be supplied by assumption. Indeed, public and private investors redefine benefits differently for each specific problem and so financial comparison depends on specific assumptions and these assumptions are highly volatile numbers. In practice the cost of achieving certainty in regard to these numbers may be such that the feasibility analyst will need to use approximation and decision rules in lieu of careful cost and revenue computations. Thus it is far more dangerous to base decisions as to feasibility on a single valuation conclusion than is true for a standard appraisal. The single number conclusion on an appraisal may be misleading but a necessity due to the fixed point required by legal loan ratios, tax assessments, or eminent domain awards. However, in feasibility analysis a major responsibility of the analyst is to define and measure in some modest way the risk or uncertainty inherent in al-

ternative courses of action as well as the optimal consequences of each alternative. One of the few meaningful methods of discussing risk at all is a forecast of a range of alternative financial results that foreseeably occur. Why lenders accept a report which determines a project is feasible when the present value of a single set of returns equals some single estimate of cost is inexplicable unless the lender is naive or devious in his actual decision process relative to the written record for those who monitor his decisions.

#### B. Measuring Investment Value of a Capital Investment

Measurable returns to the investor must normally be regarded as cash returns or cash equivalents of benefits received. "Highest and best use" might better be defined for feasibility purposes as that use which maximizes cash to the developer and minimizes cash exposure (to loss) of the developer. Cash flows can be treated either in cumulative totals in retrospect, as stylized economic studies in the mortgage-equity pattern, or as more elaborate cash management simulations.

Cumulative totals of outlays and revenues summarized for the total development period can provide initial order of magnitude relationships between sales, cost, and profit margins. One rule of thumb might be that raw land cost should equal no more than 20% of total sales value of developed lots, with streets, utilities, and administration overhead each accounting for approximately 20% of sales proceeds, leaving a balance of 20% of sales as gross profit. With these guidelines the developer would make a judgment about the feasibility of a project as structured in Illustration #9. If the gross profit cushion appeared large enough, the developer may commit to the second cycle of

# Illustration #9

## CUMULATIVE CASH-FLOW ECONOMICS

Total lot sales (300 lots X \$8,000 average price) =	\$2,400,000	100%
Less: Commissions and closing cost	240,000	10%
Total interest and financing charges	280,000	11%
Water, sewer and electric	600,000	25%
Streets grating and fees	500,000	21%
Original cost of land	200,000	9%
Management salaries	80,000	3%
Miscellaneous expenses and contingencies	100,000	4%
	<hr/>	
Total profit over 4 years of Average of 100,000 per year on initial equity cash Investment of \$100,000	\$ 400,000	17%



analysis to elaborate his initial feasibility study recorded on the back of a large envelope. However this approach eliminates meaningful analysis of credit requirements, tolerance for surprise potentials, proper staging and timing, periods of major risk exposure, or yield of money at work over time.

If one accepts the position "that any carefully prepared appraisal is truly a feasibility study"<sup>(1)</sup> then the best recognition of money at work over time is the mortgage-equity approach to real estate financial analysis. The classic statement for this position can be found in the writings of the Dean of real estate analysts, James E. Gibbons, particularly his treatises on "Apartment Feasibility Studies,"<sup>(1)</sup> and "Mortgage-Equity Capitalization and After-Tax Equity Yield."<sup>(2)</sup> However, it is our opinion that an economic justification for a capital expenditure is not quite the same as a statement that a specific project by a specific developer operating in a context unique to him, the times, or the place is feasible, i.e., enjoys a good likelihood of a satisfactory outcome. Neither the real estate entrepreneur nor the money manager organizes his affairs according to the stylized assumptions of appraisal. There remains in our mind some specific distinctions between financial analyses within reports designated as feasibility studies and financial assumptions in appraisal treatments of projects yet to be built. For purposes of loan analysis of a specified design project the mortgage equity approach may be adequate for the lender but for purposes of telling the borrower when he has a "go situation" a somewhat different financial presentation is called for to forecast a range of "success patterns."

If one accepts the generally recognized theory that the value of a capital asset is the present value of a stream of benefits measured in dollars to be received by those furnishing capital, then it is important to know the returns to each investment position after all of the claims have been met. Claims include not only operating costs but shares taken by local and federal government in the form of real estate taxes and income taxes. Considering the proportion of gross return taken by real estate taxes and federal income taxes and the variety of computations which may be made in each case, alternative courses of action should be evaluated in terms of after-tax spendable cash attributable to the real estate interest owned. Therefore, it is necessary to identify and forecast alternative sources of cash returns: (3)

1. Positive cash flows remaining from normal operational revenues over successive periods of time.
2. Positive net worth received as proceeds on sale of the property after debt and capital gain tax claims have been paid at a single point in time.
3. Surplus proceeds not subject to tax derived from refinancing of an existing mortgage balance with a larger loan balance at infrequent points in time.
4. Spendable cash salvaged from other income subject to income taxation unless shielded by tax losses generated from real estate ownership over successive periods of time.

In addition the sequence of these returns must be matched to required cash outlays to measure the nature and scale of business risk and financial risk. Business risk is concerned with the adequacy of cash resources to meet cash outlays at any given point in time. Financial risk is concerned with the adequacy of cash surpluses to repay financial obligations for interest and principal according to the terms

of financial agreement. Thus, the requirements of money management, risk analysis, and comparative yield measurement all point toward some minimum set of assumptions on the following items:

1. A time line or calendar of events related to financial assumptions.
2. A product mix and revenue sequence.
3. An operating cost and outlay sequence.
4. A capital budget outlay schedule.
5. A financing plan of credit and equity contributions and expected terms.
6. Summary sequence of cash outlay and surplus expectations.
7. Identification of possible indirect benefits and profit centers.
8. Measurement standards of risk.
9. Measurement of yield.

The analyst must recognize that with increasing detail in his simulation of financial consequences comes an expanding opportunity for error and exaggerated credibility inherent in pseudo-accurate detailing. The financial assumptions can be no more specific than confirmed planning details of the six previous elements of feasibility and yet the quantitative nature of finance can quickly lead to deceptive decimals to four places and unlimited use of significant numbers in dollar amounts. It is difficult to specify where the trade-off occurs between simulation for analysis and make-believe precision of assumptions. Also it should be recognized that when the analyst departs from gross time units of 6 month periods or quarters he is entering into the field of accounting rather than preliminary budgeting. Indeed, many CPA firms can do a better job of capital budget scheduling than the analyst who should include such professionals on the feasibility team. In any event the analyst should make explicit warning to the reader of the report as to the sensitivity of various assumptions and conclusions to modification in execution of the project.

C. The Time Line or Calendar of Events

The relative investment value of alternatives is measured by some standard of money at work over time. Financial considerations begin with a calendar of events determining outlays and receipts and thus the span of time for which specific amounts of money would be at work. Typically the appraiser assumes that the project is valued as an investment at the point where it reaches normal occupancy. Instant financial returns may be true of an existing building but feasibility analysis is generally concerned with a project to be built or a property to be reemployed in some alternative manner. Therefore, there is a lead time before plans can be made and executed and income generated from sales or rents, and lead time becomes a major factor in the scale of projects usually receiving a formal feasibility analysis. Subdivisions require a minimum of a year of progressive investment before experiencing any revenue returns and even then continued development outlays may exceed net cash returns so that continued investment is required until net cash flow is turned positive. Shopping centers may have lead times of three to five years while new towns often have time horizons for completion and full investment recapture of 51 years or more. While the project may have an ultimate value in excess of its cost it is not feasible for a specific client if the cumulative outlays of cash have exceeded the financial resources available or assumed. Thus, even the initial studies must presume a simple calendar of planning and construction schedules, absorption rates for sales or unit rentals, and cash flows over time. Progressive detailing of plans will permit more detail of the calendar of expected financial events

until ultimately the investor is able to key his weekly financial planning to the critical path of the development process.

Feasibility analysis will customarily work with annual, semi-annual or quarterly analysis and must be continued to some point where sales are completed or the investment property is assumed sold. Over this span of time various amounts of capital will be invested and hopefully a series of cash returns of irregular size will have re-turned to the investors. The time line can be indicated in the report by a schedule of financial events and assumptions, or a graphic layout of essential components in the development process, or by description in the tab of the cash flow worksheet.

#### D. Product Mix Assumptions

The cash cycle discussed earlier in Chapter IV begins with revenue from sales or rentals. The analyst must provide in a level of detail appropriate to the degree of planning completed a schedule of sales units as to type, quantity, price, and time of closing. "Time of closing" is measured in time period units chosen for analysis so that if the study is on an annual basis it is the number sold per year, or for six months or per quarter. Some caveats are in order, however, which can be illustrated by example:

##### EXAMPLE #1

If an apartment building can be rented 100% in a year, the average rate of occupancy must be used to determine first year revenue. If occupancy goes from 0 to 100 units in a year, the average occupancy is 50 units. It may be useful to use unit months if apartments are rented on a monthly basis; 100 units would have a potential revenue base of 1200 unit-months and the curve of occupancy might be skewed to favor a stronger demand in the early part of the year by basing revenues on 700 occupied unit months instead of 600 as suggested by the average of 50 occupied apartments. The use of unit-months available for rent is valuable

in testing the effects of staging or premerchandising so that units are occupied as completed. The ability to collect a given number of unit-months rent prior to closing of permanent financing, say in a 236 apartment case, will offset points paid to secure an FHA insured loan and perhaps provide opportunity for a new profit center and for a positive decision on feasibility.

#### EXAMPLE #2

When analyzing a sale of lots or other types of units, there is a significant lag between date of sale and date of closing. If many sales are financed by the seller, there is an even longer lag before sales actually generate cash for the developer. Nevertheless, the lag on revenues is not equal to the repayment terms of the financing as many land contracts and second mortgages are prepaid well before maturity date. The analyst must either provide a worksheet of cash generated from sales over time or assume sale of the financing paper by the developer at a financing charge to be included in cost projections. On one project a difference of only 9 months in lead time and revenue lag meant a shift from 1 million dollar development loan to a 2 million dollar development loan and the latter loan was not available with the conclusion that the total plan was not feasible unless it was more adroitly staged.

An adequate statement about product mix can only be made as a result of careful merchandising analysis or precise analogy to a completed project, the latter technique being very risky as it leads to an implicit assumption that all other conditions have remained the same and would be true again for the next similar project. Where the analyst uses quantities and prices supplied by the developer, he should indicate the source of the numbers as well as the method of setting the absorption rate.

#### E. Operating Budgets For Revenues and Outlets

For purposes of preliminary estimate operating expenses may be divided between those which can be stated as:

1. Fixed expenses for salaries and logistical support during the entire development period.
2. Variable expenses as a per cent of construction in place per period for professional fees, supervision and indirect items related to the building process.

3. Variable expenses as a per cent of gross sales per period to reflect commissions, closing costs, advertising and other sales related items.

With each cycle of progressive detail of feasibility for a specific project these categories can be expanded and refined but it is important to notice that items 2 and 3 are direct functions of the time schedule for construction operations and the distribution of sales units over time. The appraiser is well prepared to forecast operating expenses for the general range of investment properties but may wish to research cost assumptions appropriate to some of the more esoteric real estate development ploys of the time. For example, recreational lot developers will spend 30% of sales on commissions and promotions and secure financing at a cost of 25% or more of net profits with priorities given for allocation of available cash profit to favor one group of investors or another. With increasing detail the analyst must examine previously acceptable stereotype allowances for various expenses. For example permissible indirect cost allowances under the 236 housing program may actually provide the developer with significant profit centers. To measure the profitability of such ventures it is useful to know the difference between the cost of a payment bond as allowed by HUD and the cost of a letter of credit from the developers bank, the cost of paper work certified by HUD as opposed to the cost of repetitive processing by the skilled developer, or allowable overhead charges and those of more efficient scale operation. When critiquing operating budgets prepared by others, the analyst should strive to identify the implicit assumptions which lie behind cost forecasts or presumed cost relationships.

F. Capital Budget Outlay Schedule

The capital outlays required of any project may be supplied by existing engineering estimates, appraisal methods for estimating cost to build or replace, or by special rules of thumb appropriate to the property type and the budget constraint on the analyst. Certainly plans in an advanced state of preparation will have a variety of engineering estimates which the analyst must review to comment on their reliability, their exclusions and necessary adjustments for indirect cost items, etc. There are dozens of engineering manuals and services which may be applied as economical estimating techniques, and the cost approach favored by the appraiser has significant application to capital cost aspects of feasibility.

Actually there are successive phases of capital cost estimating for various proposed projects. First there may be capital budget allowances for broad economic studies, order of magnitudes estimates for comparative design analysis, and finally there may be specific bids available on the designed set of working drawings. Even "pre-design" estimating is misleading as there must be some design assumptions as to size of project, approximate number of units, and at least a mental picture of the final product and its construction characteristics to permit selection of comparative or analogous project costs.

Experienced developers have been testing feasibility relative to capital budget constraints with simple all-inclusive unit costs to provide decision rules as to economy and potential profitability:

EXAMPLE #1

The capital budget parameters for Columbia were initially set by its planners by deriving an average cost per acre for



water, streets, etc. for each different type of land use from single-family to industrial park lands.

#### EXAMPLE #2

A major developer of resort lands has developed a cost factor based on lineal feet of road in place and the total cost on this basis must fall below a certain percentage of total product sales value and commitments are made on these premises or decision rules long before engineering plans are available for more accurate cost projections.

In keeping with the need to simplify data collection presentation and integration into the total decision process, the analyst must rely on estimating devices and decision rules appropriate to the scale of the project, the level of planning completed at the time of the study, and time justified by the fee. Regardless of the level of planning completed, the analyst is well advised to recognize the sensitivity of conclusions to the accuracy of cost forecasts by consulting with others on the appropriate cost factors. Engineers and architects are becoming more proficient at estimating cost and in some parts of the country there are automated cost estimating services for a variety of engineering and architectural types of development. The use of such a professional service increases the credibility of the report, provides some assurance to the analyst as to the range of cost realizations which should be reasonably anticipated, and shares some of the responsibility for decisions reached. For an excellent introduction to considerations of capital budget estimating as well as the nature of construction project economics in general read Control and Management of Capital Projects, by John W. Hackney (John Wiley and Sons, Inc. New York, 1965). To control pre-designed estimating Hackney suggests matching the method to the state of existing plans, estimating by analogy to comparable projects in the early stages of analysis and allowing for some accuracy. Pre-designed estimating should make specific assumptions on those design elements which have the greatest impact on total cost. He recommends

avoiding dependence on published data for which full information on record keeping practices are unavailable and the accumulation of project costs where full data is available, analyzed by ratio and graphic curves indicating the impact of scale, number of stories, square feet of floor area and so on. At the very least the appraiser providing an economic study should provide two sets of income appraisal assumptions, one set representing an over-run in costs and underachievement of income potential (the "down-side risk") with the other set demonstrating the more likely expectation (the "up-side potential").

Perhaps the best available comprehensive study of the relationship of construction costs to economics of an investment property and required reading for any appraiser is An Economic Analysis of the Housing and Urban Development Act of 1968 by Robert P. O'Block and Robert H. Kuehn, Jr. (Division of Research, Graduate School of Business Administration, Harvard University, Boston 1970). Of particular value to a general understanding of a feasibility analysis and interplay between planning detail and financial estimating is chapters 2 & 3 of this study which describes a computer model for analyzing rents under various forms of housing finance and construction methods. Chapter 3 provides graphic representation of the relative effects of different cost variations, identifying multipliers for each cost category: (4)

$$\text{Multiplier} = \frac{\text{Change in rents}}{\text{Change in cost category}}$$

The larger the multiplier, the greater the impact on the cost structure and their relative impact is ranked by O'Block as in Illustration #10. Thus capital cost should not be regarded as an item independent of present values as some study must be provided the decision maker as to the sensitivity of dynamic relationships between capital cost and required income, operating costs, debt service payments, income tax consequences, lead time, rate of return and potential variance.

#### G. Financing Inputs and Constraints

The initial constraint on financing plans is the available capital

input by the developer, the degree to which the ownership position is willing to remain invested in the project, and the credit power of the ownership position. Unlike a mortgage equity appraisal which presumes someone in the market will have sufficient equity to meet typical credit terms for a particular real estate situation, a feasibility study must sooner or later establish the willingness or the capacity of a specific investor to supply certain resources and then devise both a schedule of net cash outlays and credit terms that have acceptable likelihood of solvency and profitability for all parties.

Reston, the new town west of Washington, D.C., may still prove to be economically justified but it was not financially feasible within the means of the original developer without proper attention to the priority of capital and operating outlays. In this era of hybrid equity-credit arrangements, including income participation loan, equity "kicker" concessions, and elaborate joint venture agreements, the feasibility analyst needs some current appreciation of formulas for dividing profits, payment and computation of interest, and forms of ownership incentives to management skills.<sup>(5)</sup> For some basic understanding of these issues and background reading the analyst should refer to the monthly The Mortgage Banker for such articles as "Lender-Developer Participation," John Opperman, The Mortgage Banker, September 1968. In the cycle of progressive detailing of feasibility considerations the analyst may begin with a standard pattern of financing appropriate to the land use under study and then should identify significant modifications of the finance plan which would increase the likelihood of success by decreasing the financial risks of the project.

Decision rules can be devised for preliminary feasibility studies to simplify financial planning , particularly where the analyst or the client has had extensive experience with a relatively standardized product. If the developer has always merchandised lots with a 100 x 150 foot frontage it is a relatively easy matter to review past projects and produce financing cost curves related to the size of project, absorption rates, expressed per lot or per lineal foot of road. These financing cost relationships can then be applied to future projects so long as the product and the absorption rate remain highly comparable. Since real estate finance is a field of its own it is impossible to treat the subject adequately in a few short lines. Suffice it to say that financial risk as well as availability of resources with which to maintain a solvent project are critical elements in determination of feasibility for a given project.

#### H. Summary Sequence of Cash-Flows

Having determined the sequence of sales revenues, operating outlays, funding schedules and costs, and capital budgeting, it is necessary to integrate these sub-schedules into a summary sequence of cash management to test business risk, financial risk, profit magnitudes, and yields. Appraisal techniques for land development have long recognized the need for cash flow sequence analysis as in the classic land appraisal demonstration article by Paul Fullerton, "Development Analysis for the Valuation of Vacant Land", The Appraisal Journal, April 1965, pp. 211-227. Is not an apartment development or an office building development subject to the same lead time considerations, absorption rate, patterns, and variable outlays per year schedules which characterize land development? Why should land development be analyzed and valued as a process while rental properties are valued as though created instantly with a full

compliment of tenants?

For an example of an integrated operations and capital budget to determine the source and application of cash resources, the financial profile of the process of development, and the basis for yield calculations, refer to Illustration 10. This illustration is taken from a complete case example of financial assumptions made for an actual subdivision project provided in Appendix C. The computer offers opportunity for the analyst to test a variety of assumptions with some attention to detail at modest cost when previously such studies were done, if at all, only after the developer had made most major decisions as to the form and character of the development. Indeed, such projections were the province of the tax accountant or the controller and were often not regarded as elements in feasibility analysis at all. There needs to be more study and education of appraisers on the difference between gross budgeting estimates appropriate to feasibility analysis and more refined detailing of plans which is properly a matter of accounting control. At a preliminary stage in planning the architect and engineer are working with schematic layouts which must be converted into detailed working drawings before final bidding and actual construction may start. Financial assumptions as to the sequence of cash flows for feasibility analysis are analogous to schematic drawings of floor plans and general specification sheets. Moreover, cash flow can refer to the monetary measure of benefits from a cost-benefit study relative to public policy questions. While many public benefits may be qualitative and better measured with some weighted point system of analysis, many benefits are dollar quantities in the form of tax revenues, sale proceeds, opportunity costs, or offsetting economies of one sort or another which have comparability to private investment cash flows and may be discounted at the cost of money rate for the agency in

### Illustration #10

#### COST CATEGORIES RANKED ACCORDING TO DECREASING MULTIPLIER EFFECTS ON RENT LEVELS REQUIRED

##### New Construction

1. Construction costs
2. Interest rate
3. Mortgage term
4. Operating expenses
5. Land acquisition cost

##### Rehabilitation

1. Rehabilitation costs
2. Interest rate
3. Operating expenses
4. Mortgage term
5. Land and building acquisition cost

Source: P. 20, An Economic Analysis of the Housing and Urban Development Act of 1968.

question.

A schematic drawing and list of assumptions for the subdivision project summarized in Illustration 11 are briefly stated in Appendix C. These assumptions quietly conceal much research necessary to justify the unit sales expectations, lot prices, inflation trends, financing costs and all the other details which underlie the summary statement. The summary statement in Illustration 11 represents a source and application of funds, an income tax approximation, and a decision machine relative to measures of profitability and risk cushion. The various items can be grouped as follows:

1. Source of funds generated must be matched to net cash generated from debt incurred in Group 4 to indirect and relative sensitivity of project to each in each period.
2. Cash outlays combine operating costs plus various capital outlays for general area developemnt for specific product construction.
3. Net cash revenue represents the balance between operating revenues and all cash outlays which needs to be funded to maintain solvency. Reference to assumption sheets in the case will indicate certain standards have been set as to the minimum cash balance, original cash equity, and the upper level of credit lines. Should cash outlays exceed equity and credit loans available, Group 8 provides a measure of the insolvency in the line "Working Capital Loan Balance".
4. The project debt structure represents a summary of financing assumptions which includes both a land contract balance and construction financing.
5. Cash available before taxes is the sum of original corporate cash resources from equity in debt adjusted for net revenues and outlays and has nothing to do with traditional views of income. It is a cash budgeting figure.
6. Taxable income from taxable operations involves sales revenue less installment balances less those outlays which are expenses, tax deductible interest, and pro rated capital costs of sales.
7. Net cash after taxes is the rational objective of the investor and a critical element in determining financial feasibility or at least relative degrees of success and satisfaction between alternative plans.

8. Anticipating the need to reinvest these proceeds for a time in the development, dividends are restricted by control of minimum of cash balances through the year 5 when retained earnings become available for distribution and are recognized as dividends paid. Strictly speaking for investors in this land development corporation, there is no investment return until dividends are paid so that the investment analyses in #9 (below) is from the viewpoint of the stockholders. If the investment were to be viewed from the standpoint of the corporation prior to dividends, then the assumptions would not permit any lag between cash available for reinvestment or for dividends paid. This particular model permits a variety of investment viewpoints to be reviewed for the same project by the way in which it can be manipulated via cash retention controls, working capital interest rates, marginal tax rates, and present value assumptions.
9. Investment analysis is concerned with cash returns on an ongoing basis and improvement in the net worth position of the investor, net worth defined as the liquidating value of the ownership position after taxes and after repayment of all debt balance. The appraiser familiar with Ellwood methods will see the parallel with his distinction between annual cash dividends and equity reversion upon resale.

Each situation for the analyst may require a variation in the model of financing assumptions and it is not the intent of this essay to elaborate on cash budgeting techniques and formats. The point to be made is that the analyst has made some study of the magnitude of resources required under several sets of construction and merchandising assumptions and match these requirements to credit and equity resources available over time.

In this era of hybrid financing which permits the lender of long term capital to receive both a basic interest charge on monies advanced and a share of residual annual cash surpluses or a share in net worth, it is desirable to extend the sequence of cash flows to the division of profits between the interested parties. A project may be most fitting in every respect to its context and the objective of profits but if these profits are siphoned from the equity position by the formula for allocating "participation shares" to creditors how can the project be judged feasible (i.e. acceptably satisfying the objectives of the developer) if there are



no cash returns? Either the explicit objectives of the developer are something other than cash flow on a long term investment or there are indirect satisfactions in maintaining operations "as usual" even though relatively profitless to the firm. Profit centers in land appreciation, construction, mortgage banking, property management, or income tax and estate planning ploys may make the project feasible but obviously such considerations are those of a specific client in a specific context. Real estate in and by itself cannot be judged financially feasible without providing a point of view from which to generate explicit financial objectives.

#### 1. Indirect Benefits and Profit Centers

Many objectives and benefits from a real estate decision are less direct than the profits of construction, land appreciation, rents or sales. These spinoff effects are often subjective and speculative but often need to be recognized if not measured. The indirect benefits are often related to the dynamic attributes of the property, particularly influence on personal responses and attitudes. One of the first contemporary office buildings found the architectural excitement of the structure drastically reduced absenteeism and employee turnover while increasing productivity of the individual. In addition the building produced much free advertising of the company name as it was used for photographic backdrop for a wide variety of consumer products advertising. These benefits will operate through the profit and loss statement of the firm but would be most elusive quantitative to measure. A well known research firm can provide invaluable prestige to a new industrial park as can an individual doctor to a clinic. Location of a public facility like City Hall may stimulate new private investment contiguous to the public site only if

it is located where there are private lands available for such spinoff. Locating a civic auditorium or music hall at a point too remote from private ownership areas implies that no value was placed on its possible stimulus to urban redevelopment and area tax assessment values. A condominium project may create listings for a brokerage office as condominium buyers sell their former homes, or lease their recreational condominiums, or look for property management assistance. These potentials exist in a majority of real estate decisions and should be recognized by an explicit listing in a report, perhaps in declining order of importance or certainty, even though no dollar value may be attached. The influence of these indirect benefits or potential adverse consequences on the decision process is directly dependent on the explicit statement on client objectives and values.

#### J. Measurement Standards of Risk

Risk is an illusive concept for real estate, a factor which everyone recognizes and "considers" but few define explicitly. One useful definition of risk is a potential variance between realizations and expectations. As income fluctuates, there is more or less doubt that the lender will receive his regular debt service payment, but the problem is establishing the degree of doubt which is acceptable. Rather than measure potential variance, most lenders attempt to provide capacity to absorb foreseeable shifts of income, occupancy and expectations. The two typical measures of cushion for variance in creditor realizations are the default ratio and the debt coverage ratio. The default ratio is the ratio of all foreseeable expenses plus real estate taxes plus interest and principal payments to the gross cash rent schedule. A default ratio of 80% in effect means that vacancies may increase 20% or rental prices can be cut by the same

amount to achieve 100% occupancy or the 20% cushion may be split between increased vacancies and expenses. The capacity of the project to meet interest and principal payment, despite unexpected variations is far more critical in determining the size of a loan and the risk of the lender than the loan ratio. Many lenders set maximum default points for each type of real estate to alert the underwriter to the significance of the cash breakeven point. If moderate rent apartment loans should produce a default point of 80% while motels are required to have default points of 60% at an average occupancy rate of 70% of capacity, the two loans may be regarded as equal risks from the standpoint of making payments on the loan. The equity position is interested in the degree to which it can generate revenues in excess of the default point, a far narrower range of alternative outcomes. From a standpoint of equity risk in regard to future expectations, a lower default point increases the range of outcomes which can provide some return to the equity position.

The debt coverage ratio is the ratio of net income available for debt service to required debt service payments, a ratio borrowed from bond analysts and less explicit as to the relationship of its magnitude to the risk position of the lender or the equity investor. If net income is 1.3 times debt service, there may be less cushion than if net income is twice that of debt service but this does not reveal the magnitude of the relationships among expenses, debt service, and gross rents as the variations that could occur which would absorb the cushion for variance.

If one defines risk as maximum potential loss as opposed to the capacity to meet minimum expectations, then risk positions shift significantly, particularly if maximum potential loss is restricted by definition to unrecovered cash outlays. The payback ratio is the cumulative after

INSERT ILLUSTRATION 11  
BETWEEN PAGES 113 AND 114

tax cash received by equity divided by either (1 total equity cash outlay or 2)) cash equivalents of property plus additional cash invested. Much of the uncertainty of real estate is concerned with changing conditions due to the passing of time. Consider a small apartment project of \$100,000 value for which an \$80,000 loan is secured with acceptable debt coverage, default point, rent levels and all the rest. If the owner had paid \$5,000 for the site some years earlier and prior to development, it then would be possible for him to recover his initial cash outlay during the first two years of operation where revenues exceeded the default point by \$2,500 a year. In another two or three years he might recover the profit he could have enjoyed by selling the lot without development. While the equity investor may no longer face any loss of his cash outlays by the end of four years, the lender may not recover all of his cash outlays for another five nor have made his desired rate of return unless he has recaptured all of his outlay as scheduled over twenty years following payback of the equity investor's "risk" capital. Moreover, there is an issue as to whether risk is concerned with expectations of future gains or maintaining past accumulations of money and prestige. It is our observation while equity positions are most concerned with conservation of existing assets. Thus the owner with little to lose is more aggressive than the lender with a long term exposure of his capital and dividend commitments to savers in the meantime. The institutional lender may be willing to take the long term risk of variance in revenues precisely because its ability to combine risk exposures into a portfolio allows it to make more precise forecasts of total variance in its results. The individual investor with a few discreet properties has less control of the cyclical swings in his average results and is therefore first concerned

with time required for payback and elimination of his maximum loss potential.

Appraisal fascination with income streams and reversion to be converted to a single present value tends to obscure the greatest risk to the investor - reliability of acquisition cost assumptions. Bargaining for an existing property or construction costs of any type are prone to lead to "surprise outlays" in excess of contingency reserves. These "over-runs" have a drastic impact on every measure of yield. A \$20 million project with an \$18 million loan would require 100% more equity if costs were only 10% higher. Therefore it is necessary to test the range of acceptable results or optional costs which will still provide acceptable default points and payback ratios. Provision for over-runs is a major measure of risk to the equity and ultimately to the credit position.

Presuming for the moment that a range or set of default points and payback rates can be set for each project type, then risk can be set equal between alternative investments or at least specifically recognized in the schematic financial plan. If that is the case, interest rate differentials and yield to various invested shares are more related to what the project can bear, yields in alternative investments, and arbitrary subjective attitudes to review results than to risk differentials of economic theory.

#### K. Measurement of Yield

Measurement of yield in real estate before the fact of having received every last nickel is an intellectual process at best and more generally a rationalization of value judgments leading to certain explicit objectives and criteria. Yield may be in terms of the mathematics of finance, the utility of disposable income, the serving of a public need, the alleviation of pain or mental anguish, or in the exhilaration of whatever it may be that turns us on to a "high". Why sneer at an equity return of 4% (ala

the Ellwood formula, for instance) on a four-flat owned by a machinist when to that owner the investment is within his means, is a sponge for his leisure time, and is a major contributor to his pride and his peace of mind? There was an investor who enjoyed a complete estate plan and super adequate income who was purchasing farm land in a small valley to assemble and maintain that valley in its natural beauty. Faced with a decision as to whether to purchase the next farm for \$50 more per acre than he had paid for any previous land, he was attempting to make a decision by devising an elaborate formula for financial yield. In this case a consulting fee was earned by requiring him to review his objectives and financial needs to convince himself of the obvious irrelevance of yield as a decision rule. Values and objectives of the investor should suggest criteria by which to judge yield in terms of money, satisfaction, and anxiety levels.

Most issues of financial yield revolve around the stream of cash dividends from all sources, the date and size of capital reversions, and the opportunity for reinvestment of cash outlays and cash receipts during the span of the investment process. For a thorough introduction to these debates the analyst should be familiar with Chapter 2, Real Estate Invest- New York, 1969. However, the Ellwood form of discounting or simple cash flow discounting is of questionable merit for the equity position as different investors have distinctively different reinvestment opportunities and money management policies. These arguments are well stated in the article "Eyeing the ROI", by Stanley B. Henrici, Harvard Business Review, May-June 1968, pp. 88-97. Publisher: Harvard School of Business. Computer systems for investment yield projections have brought these debates into the foreground.(6) From this array of alternative measures of yield the analyst may choose one appropriate to the level of detail available at the time the study is

being done and to the objectives and investment sophistication of the client from whose viewpoint feasibility must be determined. The point this essay wishes to make is the need to select a present value method of yield ratio formula compatible with the client to be served rather than any predetermined orthodoxy, economic theory, or intellectual conceit of the analyst. If the sequence of cash flows and its related inputs and assumptions have been carefully done in absolute dollar terms, ratio and yield analysis will only serve to express what common sense observation of the figure will reveal to sound business instinct. It is the opinion of this author that financial planning work sheets in dollars will suggest decision rules consistent with the character of information available at any specific stage in the decision process while overly detailed theories of yield ratios are more useful for historical financial reviews and autopsies.



FOOTNOTES

CHAPTER I:

- <sup>1</sup> "More and More of My Reports Are Valueless," Charles F. Seymour, The Appraisal Journal, Vol. XXXV, No. 4, October 1967, p. 453.
- <sup>2</sup> "Characteristics of Various Economic Studies," Anthony Downs, The Appraisal Journal, Vol. XXXIV, No. 3, July 1966, pp. 329-338.
- <sup>3</sup> "Entrepreneurs and Urban Renewal," Jewel Bellush and Murray Hausknecht, Journal of the American Institute of Planners, Vol. 32, No. 5, September 1966.
- <sup>4</sup> "Characteristics of Various Economic Studies," Anthony Downs, The Appraisal Journal, Vol. XXXIV, No. 3, July 1966, pp. 329-338.
- <sup>5</sup> Since these comments were written a far more skillful statement of the relationship between highest and best use and development profit has been published by Bruce Singer, a financial analyst with Dillingham Land Company in an article, "Optimum Developmental Intensity," The Appraisal Journal, July 1970, pp. 406-417.

CHAPTER III:

- <sup>1</sup> Larry Smith and Company offers tapes and census data with basic growth and demographic information for primary selection of retail markets.
- <sup>2</sup> For a useful demonstration of subclassification of the housing market by number of rooms, location, rent, and housing by price, number of rooms and neighborhood characteristics, one should consider purchase of Projectron, a report available for each SMSA as a ten year housing forecast by W. R. Smolkin and Associates, Inc. of New Orleans, Louisiana. It is available from the builders service department of Barrett Division of Allied Chemical Corporation.
- <sup>3</sup> Indicated as Villa Louis, Stonefield Village, and Wade House in illustration #5.
- <sup>4</sup> On the theory that the government knows government data best, refer to FHA Techniques of Housing Market Analysis, Department of Housing and Urban Development, techniques developed by FHA Field Market Analysis Service, January 1970.

CHAPTER VI:

- <sup>1</sup> Office Building and Office Layout Planning, Kenneth H. Rippen, McGraw-Hill Book Company, Inc., 1964.
- <sup>2</sup> Time Saver Standards, John Hancock Callender, Ed., McGraw-Hill Book Company, New York. 4th Edition, 1966.

Footnotes (cont.)

- 3 Construction Lending Guide, U. S. Savings and Loan League, 1970 (Outstanding reference text for residential buildings and land development).
- 4 Community and Privacy, Serge Chermayeff and Christopher Alexander, Doubleday and Co., Inc, Garden City, New York, 1963.
- 5 The analyst should have some sensitivity to the art and science of approach space arrangements. A well illustrated quick reading primer for the layman is The American Landscape, Ian Vairn, Random House, New York, 1965.

CHAPTER VII:

- 1 "Apartment Feasibility Studies," James E. Gibbons, The Appraisal Journal, July 1968, p. 325-332.
- 2 "Mortgage-Equity Capitalization and After-Tax Equity Yield," James E. Gibbons, The Appraisal Journal, January 1967, pp. 31-49.
- 3 "A Practical Computer Service for the Income Approach," James A. Graaskamp, The Appraisal Journal, January 1969, p. 50.
- 4 P. 20, An Economic Analysis of the Housing & Urban Development Act of 1968, by Robert P. O'Block and Robert H. Kuehn, Jr. (Division of Research, Graduate School of Business Administration, Harvard University, Boston 1970)
- 5 The Mortgage Bankers Association of America, 1707 H Street NW, Washington, D.C., 20006
- 6 "Computerized Calculations - Rates of Returns and Risks in Commercial Property", The Appraisal Journal, Robert C. Higgins and R. Hugh Cunningham, January 1970, pp. 37-49

## PART II

### SUGGESTED READINGS FOR FEASIBILITY ANALYSIS

Professor James A. Graaskamp  
University of Wisconsin

#### Market and Merchandising Analysis

##### BOOKS:

A Guide to Selecting Bank Locations. Department of Automation & Marketing Research, The American Bankers' Association, 90 Park Avenue, New York, N.Y. 10016 - 1965.

A Marketing Plan for Apartment Builders. William R. Smolkin. Barrett Division, Allied Chemical Corporation, 1966. (Strong on survey research and questionnaire techniques for apartment projects)

A Study of Apartment Residents Reaction to Their Apartments - 1969. Owens/Corning Fiberglas, Home Building Produces Marketing Division 1969.

A Study of the Washington, D.C. Area Apartment Residents Reaction to Their Apartments. Owens/Corning Fiberglas, Home Building Products Marketing Division, Toledo, Ohio 1968.

A Systematic Guide to Supermarket Location Analysis. Bernard J. Kane, Jr. New York: Fairchild Publications, Inc., 1966 (Author was a student of Applebaum and it is an excellent how-to-do-it text)

An Introduction to Appraising Real Property. Prof. William Kinnard, Society of Real Estate Appraisers, 1969.

Apartment and Townhouse Salesmakers' Course. Owens/Corning Fiberglas Corporation. National Bank Building, Toledo, Ohio 43601.

Control and Management of Capital Projects. John W. Hackney, John Wiley & Sons, Inc., New York 1965.

Design with Nature. Ian L. McHarg, The Natural History Press, Garden City, New York 1969.

Guide to Store Location Research. William Applebaum et al, Curt Kornblau, editor. Addison-Wesley Publishing Company 1968. (The best publication available on techniques)

Handbook on Industrial Development. The American Industrial Development Council, Inc. Executive Offices and Library, 230 Boylston Street, Boston, Mass. 02116, June 1969.

How to do Housing Market Research. A Handbook for Local Home Builders Associations, Uriel Manheim, National Association of Home Builders of the United States, Washington, D.C. 1963.

BOOKS: (Continued) SRA Feasibility Methods Outline

Local Housing Research Techniques and Data. United States Savings and Loan League, 1965.

Market Analysis Program for Home Builder-Dealers. United States Gypsum, Washington, D.C. 1963.

Metropolitan Housing Markets Forecast. National Association of Home Builders Washington, D.C. 1965.

Motels and Resorts, A Guide to Better Planning. C.A. Gunn, Cooperative Extension Service, Michigan State University, E. Lansing, Michigan, 1968.

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Report on Home Buyer's Preferences. Owens/Corning Fiberglas Corporation, Home Building Products Division, Toledo, Ohio 43601 1967.

Researching Your Local Housing Market. United States Savings and Loan League, Harold L. Jenkins, director of marketing services, 221 N. LaSalle Street, Chicago, Illinois 60601, 1963.

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The Community Builders. Edward P. Eichler and Marshall Kaplan. Berkeley: University of California Press, 1967.

The Community Builders Handbook. J. Ross McKeever, editor. Washington, D.C., Urban Land Institute, 1968.

The Hidden Dimension. Edward T. Hall, Doubleday and Company, New York 1966.

The RSVP Cycles, Creative Processes in the Human Environment. Lawrence Halprin, George Braziller, Inc., New York, 1969.

The Selection of Retail Locations. Richard L. Nelson, F. W. Dodge Corporation, New York 1958.

The Tenant Point of View. Owens/Corning Fiberglas, Home Building Products Division, Toledo, Ohio 43601, 1968.

Urban Analysis. Alfred H. Page and Warren R. Seyfried, University of Washington, Scott, Foresman and Co., 1970.

Urban Housing Market Analysis. U.S. Department of Housing and Urban Development, R. C. Weaver, Sec., Prepared by R.W. Lippold, Economist, 1967.

PERIODICALS: SRA Feasibility Methods Outline

Appel, James R. "Preparation of the Feasibility Report," Real Estate Appraiser, November 1964, pp. 33-38.

Bowes, W.A. "What is Market Analysis?" The Real Estate Appraiser, July-August 1968, pp. 11-14.

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Singer, Bruce. "Systematic Approach to Housing Market Analysis," The Appraisal Journal, October 1967, pp. 527-549.

PERIODICALS: (Continued) SRA Feasibility Methods Outline

Smith, Arnold R. "Feasibility Study of a Shopping Center," The Real Estate Appraiser, July 1967, pp. 9-15.

Smolkin, William R. "Here's a Shortcut to Estimating Garden Apartment Feasibility," House and Home, September 1965, pp1 84-85.

U.S. Housing Markets. Published Quarterly 1968, Advance Mortgage Corporation First National Building, Detroit, Michigan 48226, 1968.

Wall, Norbert F., "Planning the Housing Market Analysis," The Appraisal Journal, January 1968, pp. 98-101.

## APPENDIX A

## APPENDIX B