

JAMES A. GRAASKAMP COLLECTION OF TEACHING MATERIALS

V. INDUSTRY SEMINARS AND SPEECHES - SHORT TERM

A. Appraisal Organizations

2. 1969

- b. "Definitions and Concepts of Feasibility Analysis" and "The Real Estate Appraisal Process and Potentials of the Computer Age", sponsored by American Institute of Real Estate Appraisers, October 24-25, 1969

CHATTANOOGA MAI CHAPTER SEMINAR

American Institute of Real Estate Appraisers

October 24 - 25, 1969

"Definitions and Concepts of Feasibility Analysis"

Professor James A. Graaskamp
University of Wisconsin

1. "Feasibility studies" is a broad descriptive term for reports which are concerned with the likelihood that a particular real estate project will satisfy specific objectives within a context of limiting constraints. It is no more useful than is the generic term theft which includes robbery, burglary, embezzlement, and so on, among its specific variations.
 - A. Therefore it is necessary to analyze the concept and components of this definition in order to structure the process of performing "feasibility studies" for a client.
 - B. It will also be important to establish that various feasibility studies represent a significant departure from real estate appraisal. While your professional training as an appraiser is most valuable from the standpoint of data collection, I believe you will find your analytical training relative to appraisal a handicap in regard to comprehensive feasibility work.
 1. The well trained appraiser is trained primarily to observe what is rather than what might be. To find patterns in the past rather than to foresee a drastic new future, to avoid speculation, and to be comparable to precedents already found in the market.
 2. An appraisal report is a specialized type of feasibility analysis in which the objective of the buyer are presumed to be typical, average rather than unique, rational and objective rather than subjective.
 3. Any type of feasibility report reflects user value systems and the market is defined as the ultimate revenue source to be tapped. It is axiomatic that we can build whatever we can finance and we can legitimately finance anything which will tap a source of cash returns --- the ultimate market factor.

- II. For a given project to be determined "feasible" it is necessary for the real estate analyst to determine that there is a reasonable likelihood of satisfying specific client objectives within a network of constraints and given specific and limited resources.
 - A. "Likelihood" is a judgment call --- an intuitive or subjective statement of a probability and is related to the question of risk. Risk is concerned with the possible variation in results relative to expectation. To talk about risk it is necessary to know as many of the variables which can go wrong and the tolerance of the decision maker to absorb the surprise potential. Simply not to know is to be in doubt but it tells you nothing about the nature of the business or the financial risk.
 - B. The concept of satisfaction --- the definition of criteria of acceptable satisfaction levels depends upon the specific objectives to be achieved, measurement of the results, and the constraints which are not to be exceeded. The viewpoint and definition of satisfaction is therefore subjective because the criteria must be generated from the objectives and limitations of a specific client plan.
 - C. Because the definition of "feasible" will shift with each client, proper feasibility analysis is therefore as much concerned with precise problem stating and formulation as with measurement of the success of the problem solution.
 1. Ideally feasibility study and therefore the analyst must provide a total system of objectives, standards of satisfactions and definition of constraints to the degree that the client or the context of the situation does not clearly provide these.
 2. Many clients are unable to clearly state their own problem and so the first step is to review with them in a systematic way the elements which may be found to bear on the problem. As will be shown the appraiser most often is asked to do only a portion of the total problem stating-problem solving process but it is important to establish in writing, if only in outline form, the premises and objectives of the client which underlie the balance of the analysis to be provided by the appraiser.
 3. In appraisal you always provide a definition of value, highest and best use, theoretical definitions, shaping your procedures, and the statement of limiting conditions. These become so automatic that one loses sight of the fact that these represent a presumption of buyer-seller objectives, resources, and limiting constraints within which it is feasible to obtain a certain price in the market. The viewpoint of the appraiser is to compare a given property interest with the consensus of other users as seen in the historical market place. Feasibility analysis however, generally requires replacement of these standard subjective and unique user requirements.

III. The basic framework in feasibility analysis requires identification of constraints, alternatives, and evaluation of criteria in each of the following subject areas:

A. Objectives of the parties at interest.

1. Strategic objectives
2. Secondary objectives
3. Preferred style of business management
 - a. Scale of enterprise.
 - b. Time horizon for a commitment and realization.
 - c. Essence of role or function of enterprise to be housed.
 - d. Specific functions of enterprise to be served.
 - e. Preferred method of static risk control.
 - f. Preferred method of dynamic risk control.
 - g. Preferred revenue source and its characteristics.
 - h. Preferred method of personnel management and motivation.
 - i. Preferred method of leasing capital.

B. Market trends and opportunity areas.

1. Aggregate data on population, employment, income, etc.
2. Economic and national policies affecting timing, risk, etc.
3. National programs with specific focus on a community or client.

C. Merchandising targets and alternatives.

1. Specific small groups with space needs.
2. Characteristics of these space requirements.
3. Ability to pay for required space.

D. Legal-political constraints and alternatives

1. Regulatory controls on all investors.
2. Regulatory controls on site and space development.
3. Political attitudes and consequences.

E. Physical-technical constraints and alternatives.

1. Location requirements.
2. Site attributes.
3. Improvement attributes.
4. Space user requirements.

F. Esthetic-ethical constraints and alternatives.

1. Community considerations and relationships.
2. Space user considerations.
3. Prime contractor-subcontractor relationships.
4. Client obligations to his own interest and goals.

G. Financial constraints and alternatives.

1. Financial time-line assumptions.
2. Capital budget requirements and resources.
3. Operating budgets and resources.
4. Profit expectations.
5. Measurement of yield and risk.

- IV. Only after you have identified the full range of considerations which may be involved in feasibility analysis can one begin to understand the proper nomenclature of the various types of reports which are lumped under the general terminology of "feasibility studies".
- A. Reports can be classified as follows: (refer to syllabus for article by James Downs).
1. Strategy studies---selection of objectives and measurement criteria.
 2. Market trend study---economic base, and related aggregate data analysis.
 3. Merchandising studies---consumer surveys, competitive property analysis, marketability evaluations, etc.
 4. Legal opinions, model laws and forms, and political strategies.
 5. Engineering, land planning, and architectural studies.
 6. Compatibility studies.
 7. Capital budgets, cash flow forecasts, rate of return analysis, financing plans, etc.
- V. At the University we define real estate as artificial space. The first man to roll a rock in front of a cave delineated a natural void from the total space that surrounds him (to achieve some attribute of safety or comfort which he did not find in nature) and thereby created real estate. Whether the delineation of space is a simple pilon at the corner of a field on the Nile or a condominium plat on file with the register of deeds, all of the hardware of real estate is concerned with delineation of space, space which is fixed in reference to some point on the surface of the earth.
- A. The essence of real estate is space, and that is the commodity which has value. Since the space must house some activity of those who built it, it can be given various attributes in regard to its function.
- B. Real estate is the business of manufacturing, financing, merchandising, and managing artificial space. The essence of any business, public or private, is the management of resources, generally cash, through a process which eventually brings back the resource. Cash---raw material---goods in process---inventory---accounts receivable---cash plus surplus is the abstract pattern of the cash cycle.
- C. Completion of the cash cycle is the ultimate demonstration of feasibility. Thus before an outlay is made there must be some expectation of how these outlays will be returned. The revenue source to be tapped defines the limits of feasibility. Today cash receipts may include cost, interest, or rent subsidies both public and private. Therefore the primary concern is determining effective demand and how this is converted to completion of the cash cycle process.
- VI. The first step in doing a total feasibility study is to define the essence of the enterprise to be housed in the space to be tested for feasibility. This essence will determine both its appropriate situs factors and its desirable or essential physical characteristics. But most important its economic essence will determine the model of the process by which it converts and attracts cash into the cash cycle. Economic feasibility is economic model building---something you have been doing for years although perhaps not by that name. (I/C = V is an economic model which can be elaborated many different ways).

- A. Teaching feasibility analysis is a problem of teaching creative modeling techniques which can be adapted to the great variety of real estate projects which you may be called on to analyze.
 - 1. Teaching modeling as a method of creative thinking about real estate is different than teaching models in the form of check lists for various types of projects.
 - 2. The requirements of a specific filling station company site are check lists derived from a model of that particular operation. A format of a study of a supermarket may become stereotyped as a model.

- B. What I would like to demonstrate in part this morning and tomorrow morning are ways of thinking in order to better state the clients problems and objectives or to simplify the collection and analysis of information relative to the constraints and alternatives specified for the problem. Model building can operate through:
 - 1. A process of enrichment, i.e. elaboration of very simple models.
 - 2. Analogy and association with previously developed model.
 - 3. Alternating attention to partial aspects of the total solution.

- C. A point to begin analysis can be suggested by a variety of conscious mental tricks which will stimulate and increase the frequency of a breakthrough in your understanding of a particular modeling problem, such as:
 - 1. Begin attribute analysis of a factor such as the site, or the client business operation, or a consumer iwth money to spend.
 - 2. Study behavioral pattern of ultimate consumer.
 - 3. Search for the implicit assumption of clients premises.
 - 4. Attempt to justify the reverse of the client suggested solution.
 - 5. Search for a method to merchandise the negative factors in the solution to be tested for feasibility.
 - 6. Find a logical reason for eliminating the need for information.
 - 7. Gain insight by means of personal, direct, symbolic, or fantasy analogy.

- D. Each feasibility study has a major element of creativity, of abstracting and conceptualizing, and of probing to make the implicit---explicit. Therefore the art of doing a feasibility study has much in common with the architect attempting to serve the needs of a client in the design and construction of a building.
 - 1. The appraiser is generally asked to critically review for feasibility a specific project already defined by the client or he is asked to determine what type of project would best serve the broader objectives of a client. In the first case its like serving as architectural critic or review board where as in the second is serving as the economic architect himself.

2. Just as the specific requirements of an architectural problem or client program have become too complex for intuitive resolution and design, so to have the subject areas of interest for feasibility analysis become too complex for intuitive judgments about the probability of satisfaction within existing constraints and limitations.
3. The architect must simulate and anticipate the construction process in his choice of a design. Full feasibility analysis requires complete simulation of the entrepreneurial process. To the degree that the client is providing as given various answers to the components of complete feasibility analysis, the analyst should provide in the report a statement of these constraints just as he prefaces an appraisal report with definitions of value, market behavior, and a statement of limiting conditions.
4. Just as the architect may move through several sequences in his planning such as schematics, preliminary plans, working drawings and specifications, the feasibility analyst should properly identify the sequence level of his analysis and the specific elements of total feasibility with which he has dealt. If the professions could agree on terminology as to report nomenclature, the client could better understand what to expect in a report and the weight which should be given the results.

Society of Real Estate Appraisers

SUGGESTED READINGS FOR FEASIBILITY ANALYSIS

Professor James A. Graaskamp
University of Wisconsin

Great Lakes Appraisal Conference
October 9-11, 1969, Grand Rapids, Michigan

Market and Merchandising Analysis

BOOKS:

A Systematic Guide to Supermarket Location Analysis. Bernard J. Kane, Jr.
New York: Fairchild Publications, Inc., 1966.

A Marketing Plan for Apartment Builders. William R. Smolkin. Barrett Division,
Allied Chemical Corporation, 1966.

Guide to Store Location Research. William Applebaum et al., Curt Kornblau
editor. Addison-Wesley Publishing Company, 1968.

PERIODICALS:

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.

Downs, Anthony. "Characteristics of Various Economic Studies", The Appraisal
Journal. July 1966, pp. 329-338.

_____. "Feasibility Study Outline", Industrial Development.
April 1961, pp. 73-78.

Gibbons, James E. "Apartment Feasibility Studies", The Appraisal Journal.
July 1968, pp. 325-332.

Johnson, Philip M. "Rehabilitation Feasibility Studies of Federally-assisted
Areas", The Appraisal Journal. April 1966, pp. 183-195.

_____. "Relocation: The Right Way to Pick a New Location", Business
Management. April 1968, pp. 41-66.

Rowlson, John F. "Land Utilization and Marketability", The Real Estate
Appraiser. May-June 1968, pp. 52-55.

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

General Reading for Feasibility Concepts

Synectics. William J.J. Gordon. New York: Harper & Row, 1961.

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

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

Urban Land Use Planning. F. Stuart Chapin, Jr. 2d ed. Urbana, Ill., University of Illinois Press, 1965.

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

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

Notes on the Synthesis of Form. Christopher Alexander. Cambridge: Harvard University Press, 1966.

Projectron: 10-year Housing Market Analysis. W.R. Smolkin and Associates, Inc. International House Building New Orleans, Louisiana 70130 Attn: Suite 505. Barrett Division, Allied Chemical Corporation, 1966.

Gruen Nina and Gruen Claude. "A Behavioral Approach to Determining Optimum Location for the Retail Firm", Land Economics. August 1967, pp. 320-328.

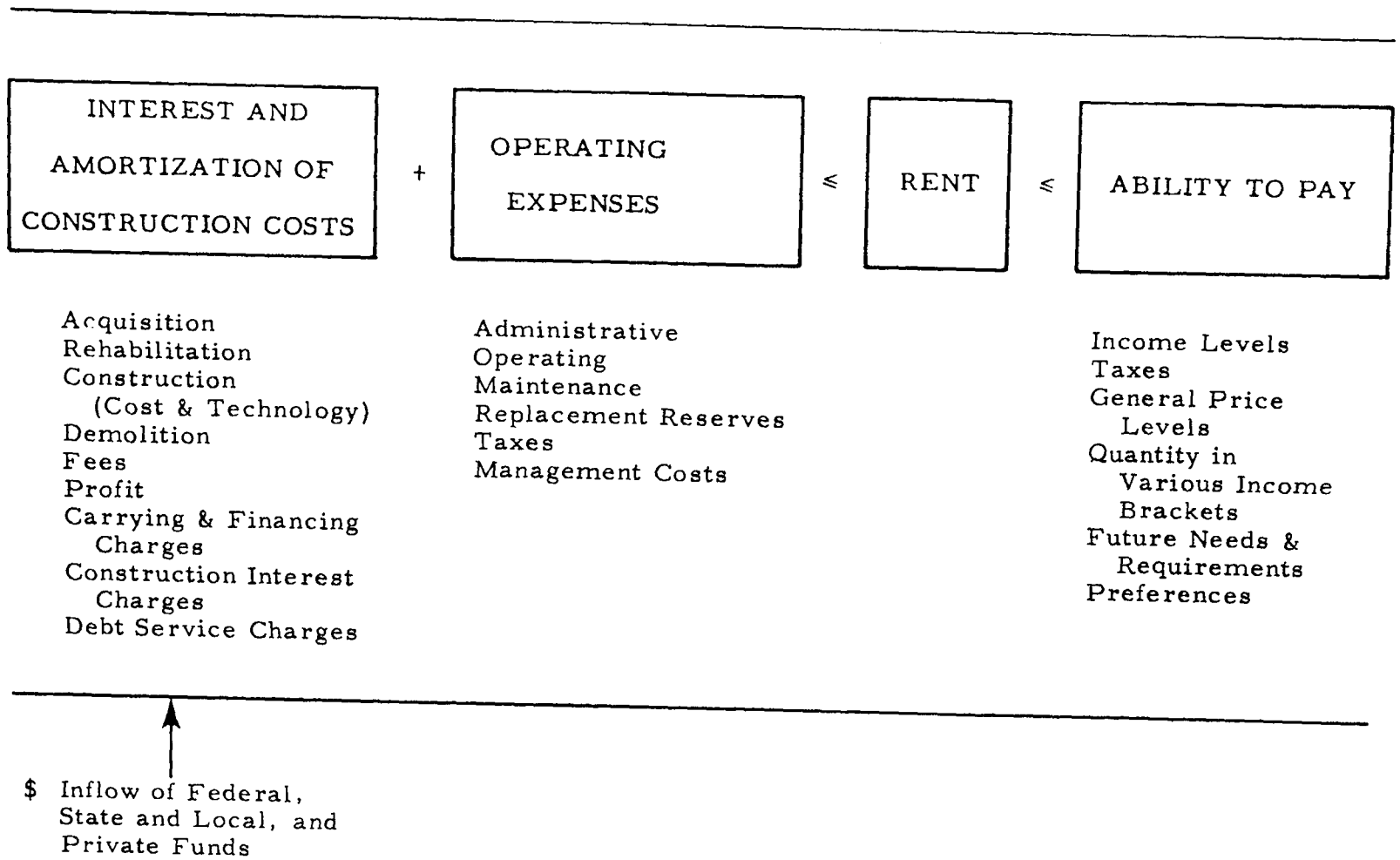
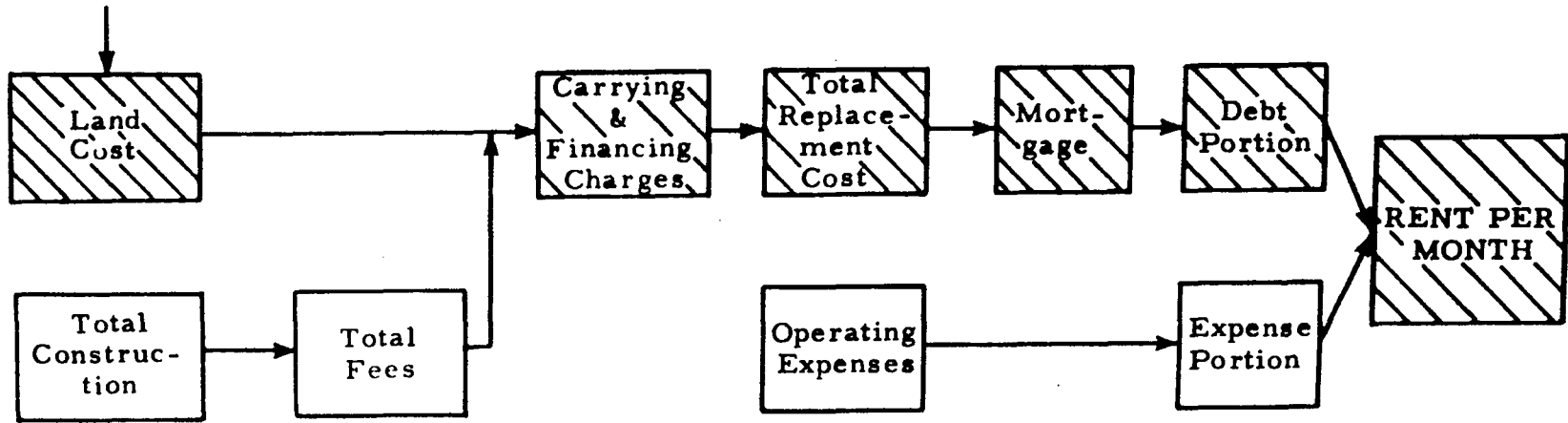


Figure 2. Organizing Principle of Low-Income Housing Model

The Consumption Sector	The Financial Sector		The Production Sector
OCCUPANT	PRIVATE INVESTOR	GOVERNMENT SUBSIDY	TECHNOLOGY
1. Ability to pay rent 2. Requirements demanded of the product	1. Type of investor 2. Rates of return (profit, present value) 3. The supply of units and/or dollars 4. Tax shields, depreciation, and tax bracket 5. Ability for training and organization	1. Type of programs available [221 (d), rent supplement] 2. Quantity of funds 3. Efficiency of funds	1. Land and/or building acquisition. 2. Rehabilitation and/or new constructions 3. Fees, financing and carrying charges 4. Operating costs 5. Standard conditions of the above 6. Forecast the impact of technology on the above and the other three sectors

Figure 3. The Three Sectors in the Housing Study

I. Land Write-Down Subsidy



II. Construction Cost Subsidy

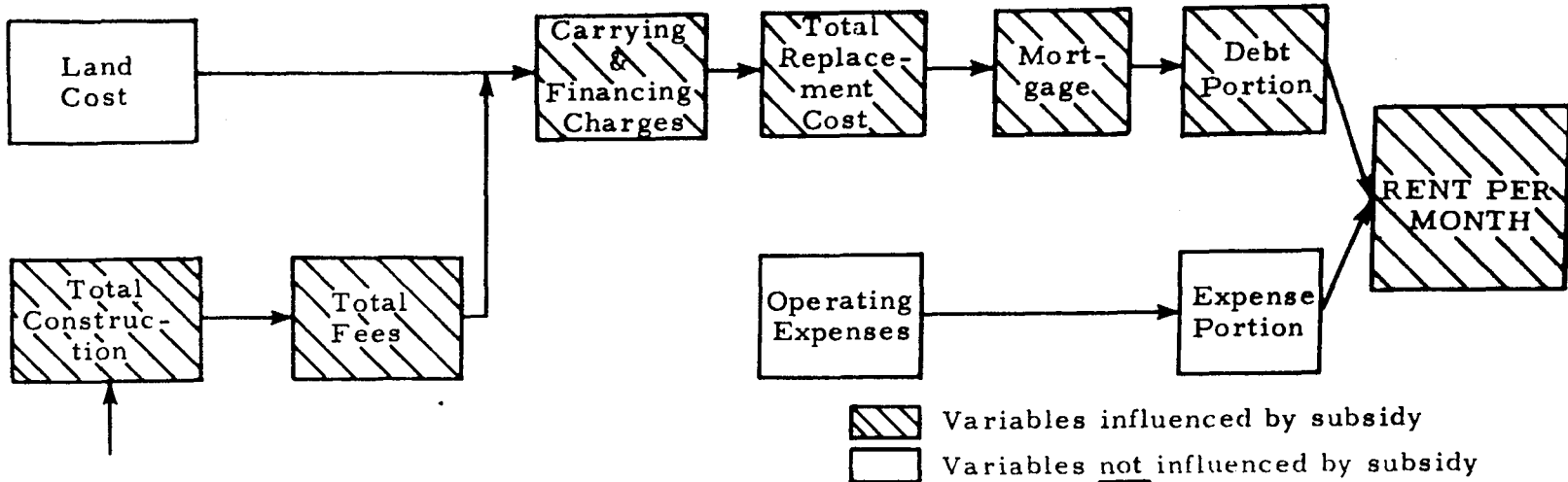
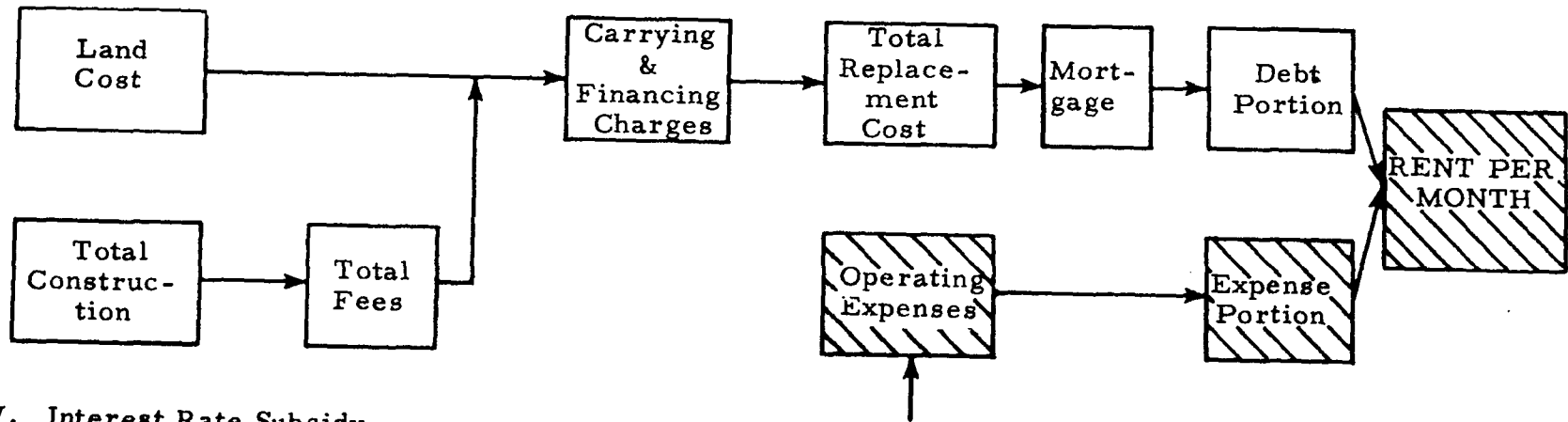
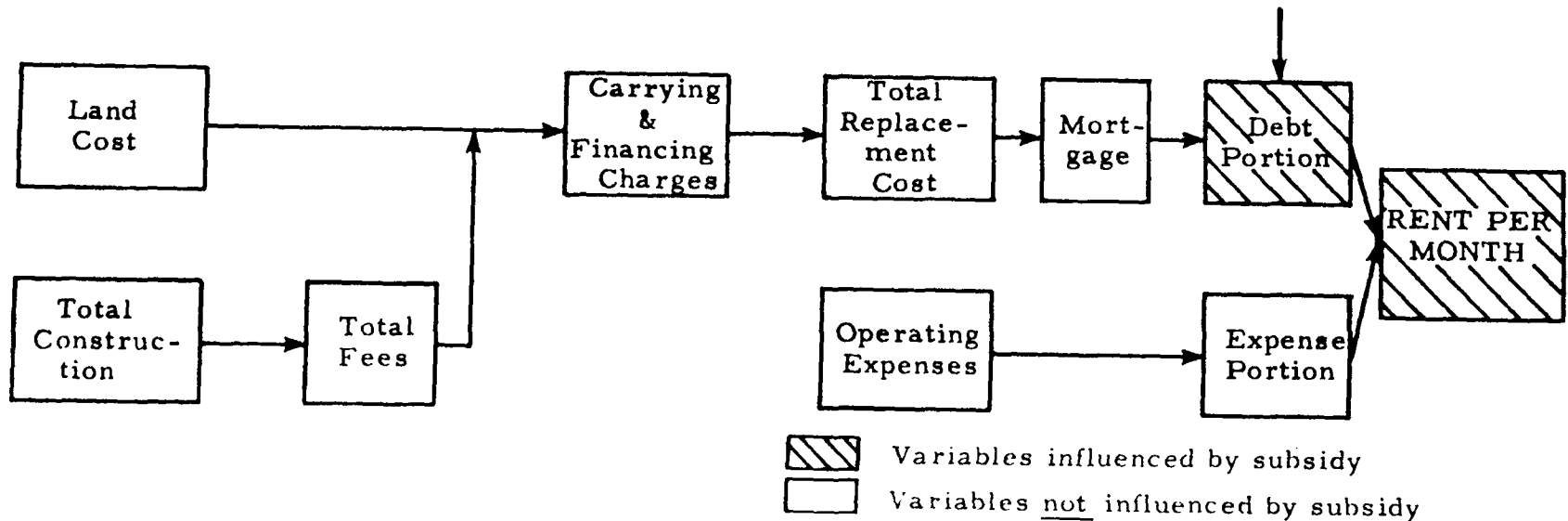


Figure 6. Schematic Representation of Alternate Subsidy Flows

III. Operating Expense Subsidy



IV. Interest Rate Subsidy





 Variables influenced by subsidy
 Variables not influenced by subsidy

Figure 6. Schematic Representation of Alternate Subsidy Flows (Continued)

October 24 - 25, 1969

THE REAL ESTATE APPRAISAL PROCESS AND
POTENTIALS OF THE COMPUTER AGE

- I. Introductory definitions and program objectives
 - A. Definition of real estate as space rather than solid
 - B. Appraisal defined as forecasting economic behavior relative to artificial space.
 - C. The need for simplifying models of human behavior.
 - D. Computers make more elaborate models possible.
 1. A computer is a mechanical processing of a logical procedure to manipulate information.
 2. The essence of computer application is the selection of the procedure and not of hardware so that hardware is not the subject for discussion.
 - E. Definition and choice of the logical process for decision-making.
 - F. The issue of "which process" brings appraisal face-to-face with the need to understand the nature of its traditional procedures and the current evolution in other decision methods.
 - G. Real estate appraisal or investment counseling is a decision-making function.
 1. Appraisal is limited to an objective decision about probable sales price
 2. Counseling is more subjective and involved in the purposes for which an appraisal may be sought.
- II. The problem of decision-making
 - A. Origins of patterns of group decision-making and decision-making specialists (the devil theory).
 - B. Origins and flaws in a system of reason and logic
 - C. The scientific method and statistical decision-making

- D. Real estate appraisal - split origins
 - E. Computer techniques provide new opportunities to improve the appraisal decision-making model
 - F. A description of statistical decision-making
 - G. The problem of probability of alternative outcomes
 - H. The problem of measuring desirability of alternative outcomes
 - I. A pictorial representation of the system
 - J. The final test - the pragmatic rule - "does it work?"
- III. Choosing appraisal systems for the computer
- A. The income and cost approach as models of reason
 - B. The market comparison approach - the beginning of the scientific method
 - C. Modeling and thinking by analogy
 - D. Three approaches to value - the classic real estate model of Marshall's economic man
 - E. Three types of model building
 - 1. Physical models
 - 2. Abstract models
 - 3. Symbolic models
 - F. Advantages of model building
 - G. Disadvantages and pitfalls of model building
 - H. Practical problems in using a model
 - 1. Interface between input source and model
 - 2. Interface between output of model and decision-maker
 - I. Balancing model-making and data-collecting - an evolutionary process
 - J. Criteria for evaluation and classification of models
 - K. Types of computer models to be evaluated and laboratory session

1. A teaching model for University students
2. A teaching model for real estate professionals
3. An alternative service for real estate professionals
4. An architectural model for refinements of highest and best use
5. A statistical model for rate of return probability analysis
6. A regression model of single-family market transactions
7. A market comparison model using adjustment factors generated from regression analysis
8. A tax assessment market value system for Orange County, Calif.

IV. Basic Concepts of Statistical Regression Models

A. Some Basic Concepts

1. The functional statement
2. Estimating equation
3. Residual
4. Average, standard error

B. Components of Regression Analysis

1. The linear case - one independent variable
 - a. Graphic example
 1. Estimating equation
 2. Standard error
 3. Coefficient of Correlation
 - b. Some problems
 1. Outliers
 2. Non-linear relations
 3. Relevant zone
2. Many Independent Variables
 - a. Selection of independent variables
 1. Types of variables
 2. Coding of variables

American Institute of Real Estate Appraisers

October 24 - 25, 1969

I. Introductory definitions and objectives

- A. Real estate is defined as artificially differentiated space with a locus on the surface of our planet. A field marker on the Nile or a condominium high-rise plat are improvements, all of which are designed to delineate space. Voids rather than physical improvements are the essence of real estate.
- B. Appraisal is concerned with predicting economic behavior relative to space in a given locus.
- C. Human behavior is so varied we simplify the process by assuming behavior will follow certain models.
- D. Computers make possible more elaborate models and the problem in applying computers to real estate is choosing behavior models that predict economic behavior.
 - 1. Discussion of computer applications to appraisal and real estate investment analysis should not be a description of hardware, or programming, or fancy investment concepts.
 - 2. A computer is a mechanical processing of a procedure for logical organization and manipulation of information- an extension of an orderly process developed by someone to accomplish a specific objective.
- E. What is necessary is to identify and define the process which the computer is to follow and to define the problem area which justifies the time and expense of bringing the computer to bear on the problem area.
- F. Assuming we use the computer to expand our decision-making processes in real estate we first need a description of a rational decision process and the definition of the problem area for real estate analysis. Given a system and a problem we will review a series of presently operational techniques starting with the Ellwood system as an economic model of presumed buyer behavior and moving to several statistical economic behavior models which are on the time horizon of real estate appraisal.
- G. Real estate appraisal or investment counseling is a decision-making function.
 - 1. Appraisal is limited to an objective decision about probable sales price
 - 2. Counseling is more subjective and involved in the purposes for which an appraisal may be sought.
- H. Computers are forcing real estate appraisers to consider methods of making decisions more sophisticated than traditional appraisal methods. Therefore, discussion about computer applications must begin with discussion about methods of making decisions.

- b. Estimating equation
 - 1. General form
 - 2. Specific example
- c. Some problems
 - 1. Marginal utility of independent variables
 - 2. Problem sale
 - 3. Regression assumptions
- V. Critical Review of Regression Applications to Appraisal (Lab session)
 - A. The Bayside Regression Model for Estimating Single-Family Home Market Price
 - B. The Bayside Market Comparison with Regression Coefficients as Adjustments
 - C. Estimated Sales Price in the Orange County Model by Robert Gustafson
- VI. Critical Review of Cash-Flow Heuristic and Statistical Models (Lab session)
 - A. University of Wisconsin teaching model
 - B. Investment Compraisal teaching model
 - C. Rate of return analysis by Econometrics
 - D. A capital budgeting design model
 - E. The Harvard Group Risk Model