JAMES A. GRAASKAMP COLLECTION OF TEACHING MATERIALS
V.   INDUSTRY SEMINARS AND SPEECHES - SHORT TERM
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(Experimental Prototype)

ONE DAY WORKSHOP

REAL ESTATE FEASIBILITY ANALYSIS FOR THE APPRAISER

Prepared at Request of:

1975 Seminar Committee
American Institute of Real Estate Appraisers

For Presentation to:

AIREA Kentucky & Indiana Chapters
September 12, 1975

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University of Wisconsin
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One Day Workshop

REAL ESTATE FEASIBILITY ANALYSIS FOR THE APPRAISER

New Albany, Indiana, September 12, 1975

Outline of Topics

Morning Session:

1.000 Basic Concept Defining Feasibility Concept

    1.100 What is real estate?

    1.200 What are decision-making mechanisms for problem solving?

    1.300 What does feasibility mean?

    1.400 What is the problem as perceived by the client?

    1.500 What is the problem as understood by the consultant?

2.000 The Capital Outlay Approach to Feasibility

    2.100 Capital outlay worksheet kit

    2.200 Alternatives for defining total capital cost of project

    2.300 Allocating cash cost contribution between mortgage dollars and equity dollars

    2.400 Allocating operating cost estimates to alternative revenue units

    2.500 Computing rental income required by unit type

    2.600 Implications of required rental income estimate

    2.700 Risk management concepts applied to real estate financial analysis

    2.800 Basic tests for risk bearing capacity

    2.900 Rate of return concepts for initial feasibility analysis

Afternoon Session:

3.000 Market Revenue Model Worksheet

    3.100 Market revenue worksheet kit

    3.200 Selection of rental detail options

    3.300 Operating expenses and real estate taxes

    3.400 Default ratio requirement

    3.500 Justified debt structure

    3.600 Justified equity cash contribution

One Day Workshop on Real Estate Feasibility Analysis
For the Appraiser
Prepared for
American Institute of Real Estate Appraisers
Prof. James A. Graaskamp
University of Wisconsin

1.000 Basic Concepts Defining the Feasibility Assignment

1.100 What is real estate? The industry is very sloppy in the use
       of the term real estate and real estate development so that the
       term no longer provides the clue to any systematic understanding
       of the concept. Careful definition of any term avoids misunder-
       standing or analysis based on false premises.

       1.110 The real estate product is often thought to be a very
              tangible physical site with structural improvements.
              In essence, however, it is always an abstract intangible
              space-time unit.

              It is always the spaces enclosed by the structure or
              defined by the borders of the site which are useful -
              not the land or the solid portion of the structure per se.

              The economic unit of real estate is sq. ft./year, apartment
              rent/month, room per night, tennis court per hour, coliseum
              per event/day, wilderness park/century, and so on.

       1.120 An enterprise is any organized undertaking. Many enterprises
              are cash cycle enterprises which use cash to acquire raw
              material, labor to produce an inventory of goods or provide
              services which generate revenue in the form of cash. A
              real estate enterprise is any systematic approach to
              converting cash to a space-time product or conversely
              converting an inventory of space-time to cash.

              1.121 Flexibility of the enterprise depends on duration
                     of the time cycle.
              1.122 All cash cycle enterprises must achieve cash break-
                     even or self destruct.
              1.123 Solvency becomes the minimum objective and absolute
                     control on consumer, investor/supplier, and public
                     service agencies.
              1.124 Equilibrium in the community occurs where all
                     enterprises involved in real estate achieve solvency.

       1.130 The systems engineer sees the eventual form of an enterprise,
              in terms of both its configuration and behavior, as represen-
              ting a negotiated consensus between two general sources
              of power - the power of the environment to dictate form
              and behavior of the organization of one hand and the
              power of the organization to decide for itself what its
              characteristics and behavior will be on the other.

The functional steps in any systematic enterprise are:

1.131 Goal-setting
1.132 Forming policies
1.133 Searching for opportunities which are consistent
with policies
1.134 Selecting opportunities which are consistent with
policies
1.135 Designing <u>systems</u> for capturing selected opportunities
1.136 Installing <u>systems</u> for capturing selected opportunities
1.137 Operating the <u>systems</u> that have been installed
1.138 Maintaining and continuously perfecting the operating
<u>systems</u>

1.140 <u>The real estate process</u> is the interaction of consumer
cash cycle enterpises requiring space-time units and the
enterprises which supply the space-time unit and services
which make them operational. Supply enterprises may include
those in the private sector such as developers, property
managers, bankers, and all the rest and those in the public
sector including all of the utility, roads, police and
fire services, and other systems which make an individual
property operational in the urban context.

The consumer, the producer, and the public infrastructure
enterprises often appear to be in conflict but ultimately
these vested interests must find a joint solution to each
real estate problem which recognizes:

1.141 That land is a finite physical resource which must
be used consistent with environmental safety and
public priorities for food, shelter, safety, health,
and so on.

1.142 Neither the consumer, producer, or public enterprise
can require the others to make outlays which
inevitably lead to insolvency. Cash is the ultimate
property, not non-vested and speculative rights to
future opportunities. Eminent domain must always
make compensation in cash, not in kind. The power
to force insolvency on others is the power to destroy an
enterprise. While free enterprise depends on that
war between private enterprises, it is not an
acceptable relationship between public and private
enterprises.

The real estate process is the interaction of consumer,
producer, and public infrastructure services as they attempt
to resolve their enterprise problems within cash constraints
while respecting land as a fragile and finite public resource.

1.143 <u>Each enterprise</u> is attempting to convert its require-
ments relative to the space-time real estate product
to projections of its cash receipts and outlays in
order to make decisions about its role in the real
estate process.

1.134 The fact that consumer, producer and public agency each must achieve solvency provides opportunity to test and discover alternative solutions in common since no one viewpoint can ask any of the others to endure insolvency.

1.150 Risk for any enterprise is the variance that will occur between its assumptions about space-time and money-time projections and its realizations, between proforma income projections and actual receipt and expenditures realized.

 1.151 Risk management controls variance due to surprise from static risks such as fire or dynamic risks of entrepreneurial skills.

 1.152 The feasibility analyst is a risk manager who must first conserve the net worth of his client from loss and then stabilize future variance in expectations.

1.160 Real estate analysis is concerned with the search for the real estate product (space-time unit) which best fits the consumer cash constraints, the public infrastructure costs and revenue, and the cash requirement of the producer within the natural limitations of land, both single parcels and collectively. The failure of any segment of this process ultimately leads to the collapse of the others.

Real estate analysis is concerned with making and testing the assumptions which are the basis of real estate decisions to judge their fit to the needs and solvency limitations of all those affected by the decision.

1.200 What are Decision Making Mechanisms for Real Estate Problems?

1.210 In general, a decision requires that information be systematically organized to identify choices of action and the alternative outcomes from each choice. (See diagram #1) At the same time facts help shape general values which in turn lead to explicit objectives, and then specific selection criteria.
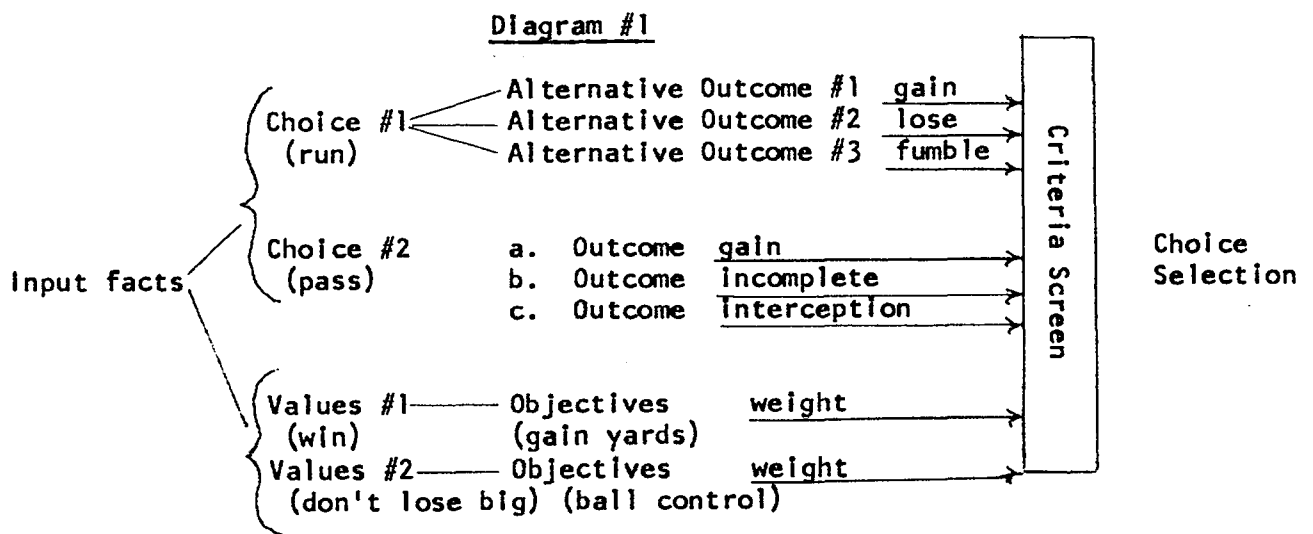
Diagram #1

Diagram #1

The systems engineer might diagram a decision as a simple flow chart below. (See Diagram #2)

Diagram #2
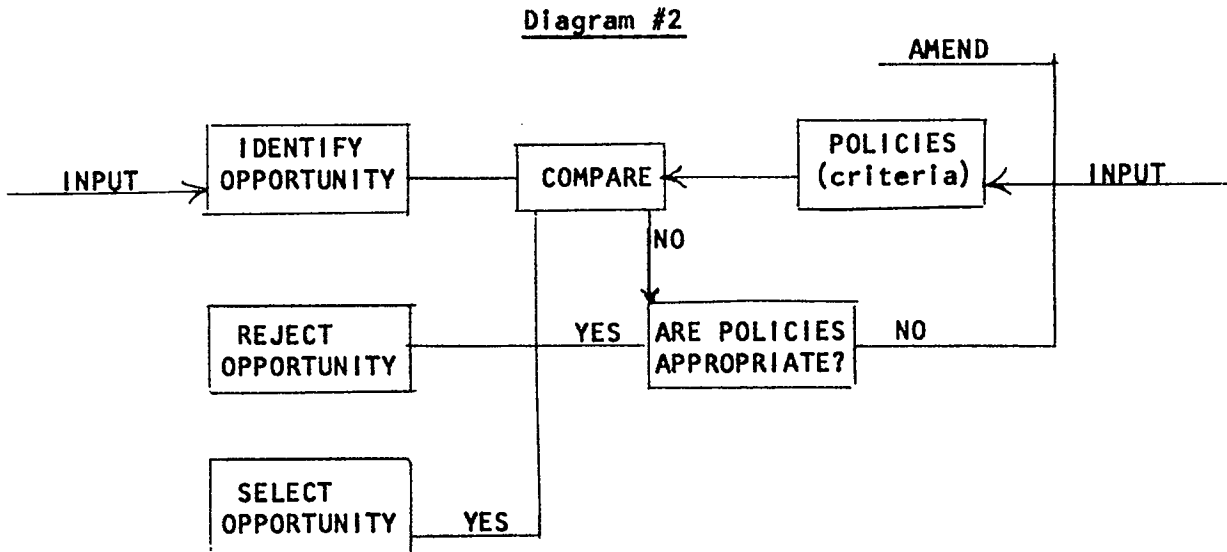
1.220 <u>Models of relationships</u> permit analysis of complex decisions involving many variables which require a systematic approach to permit comprehensive analysis, a careful statement of relationships among variables, and successful communication of the answers that result. <u>Any model has three basic inputs:</u>

    1.221 A careful statement of the question or decision

    1.222 Determination of implementation available or obtainable

    1.223 A statement (hypothesis) about the relationship of the data to the question.

    1.224 Models can be used to state mathematical relationships, so that the Ellwood formulas are representative of the relationship of financial value to net income under explicit assumptions about financing, resale, and the trend in net income.

    1.225 Models may also be used to communicate complex relationships in simple ways which may be more relevant to the decision maker.

1.230 <u>Constraints on the use of models</u> to answer any particular problem requirement and models should be judged in terms of how they meet these constraints:

    1.231 What are the limitations of the analyst who intends to use the model? Does he understand the implications and can he do the analysis?

1.232 Communication of the results must have credibility
with the decision maker. The client who has succeeded
with decisions made using the net income multiplier
may not accept an improved analysis as a result
of cash flow projections or regression analysis.

1.233 In all cases the cost of executing a particular model
must be appropriate to the utility value of the
result. The cost-benefit ratio must favor the
decision model technique selected.

1.240 The appraiser is accustomed to modeling the appraisal
process by the format of his report and exhibits. The
three approaches to value the recommended report outlines
are examples of modeling an analytical problem by format.
As long as the question is always the same - what is
fair market value - and the data is always similar, it is
easiest to train the analyst to condition the client as
to credibility implied by an approved format, and probably
to reduce cost doing the same thing in the same way
each time.

1.250 The feasibility analyst will find the most proven method
for approaching new questions and decisions which may
seem strange at first, is to relate them to familiar
questions and problems by analogy. There is a system of
creative thought called Synectics which suggests that
problems with no immediate satisfactory solution should
always be researched "to make the strange familiar and
the familiar strange" in order to gain perspective. The
technique is both a teaching tool and a tool for intellec-
tual discovery depending on conscious use of analogy.

This technique begins to structure a problem, identify
data which needs to be collected, and assists in commun-
icating the analytical approach and its reliability to
the client. (More examples in Sect. 3.000)

1.260 Use of a matrix to model a decision allows the analyst
to structure the essential relationships and interrelation-
ships of multiple variables to one another, and serves to
structure both the data search and related analysis and
report presentation in a concise and almost graphic manner.

Example of Site Variable Matrix (or Semi-Lattice)

Site Variables

Physical
- Site Topography
- Site Improvements
- Site Circulation
- Site/Neighborhood Interface

Dynamic
- Neighborhood Circulation
- Site/Neighborhood Image
- Reinforcement of the Surrounding Neighbor'd.
- Neighborhood Services

Economic
- Site Acquisition Costs
- Remodel-Construction Time & Cost Constraints
- Site & Improvements Operating & Maint. Costs
- Tax Base Implications

Dynamic Variables Scores — Total Score 45

3 | 4 | 16 | 12

Economic Variables Scores — Total Score 52

12 | 13 | 15 | 12

Physical Variables Scores — Total Score 68

16 | 16 | 21 | 10

Matrix values:
```
        1
      2   1
    3 2 3 1
    3 2 3 1
    2 3 1 2
      3 1 3 2
      3 2 3 1
        1 2 3 1
        1 1 2 1
          1 2 1 1
          1 1 2 1
            1 2 1
            2 2
              2
```

Legend
- 1 = Weak Interaction
- 2 = Moderate Interaction
- 3 = Strong Interaction

Resulting Variables Priorities
1. - Site Improvements
2. - Site Circulation
   - Site/Neighborhood Interface
   - Reinforcement of Surround'g Neighbor'd
3. - Site Improvements Operat'g & Maint. Costs
4. - Site/Neighbor'd Image
5. - Remodel'g - Construction Time & Cost Constraints

1.270 Real estate decisions give form to certain variables which are in the control of the decision maker. Critiquing the form of the real estate solution is analogous to the artistic concept of judging the form of an art object by examining the context in which it was created. For example, a clay jug must be first related to its intended purpose, to boil water or to hold a single rosebud, in light of limitations in the clay material, the heat source for boiling water or the weight of the rose, the availability of a potters wheel, and so on.

The form of the clay jug must _fit_ the context in which it was created so that success must be judged only when the relationship of form to context is known. For the artist contexts are those elements which are given and cannot be changed, to which any solution must adapt, while elements of form are those variables within the artists' control at any particular time.

1.300 The concept of feasibility is elusive and much abused. Combining the systems concept of enterprise under conditions of uncertainty and the physical design concept of _fit_ leads to the following definition:

"A real estate project is 'feasible' when the real estate analyst determines that there is a reasonable liklihood of satisfying explicit objectives when a selected course of action is tested for fit to a context of specific constraints and limited resources."

1.310 The problem of defining objectives and measuring success depends almost entirely on correctly defining the problem and values of the client. If ball control is the number one objective, then the forward pass is much less likely to fit the requirements in many situations than if crowd pleasing thrills and drama are the primary requirements of the play caller.

The majority of enterprises are not solely interested in rate of return on investment or lowest cost.

Most decisions must fit a combination of success "measures," with each decision maker weighting the overall importance of each item differently. Examples of such measures would be:

1.311 A check list of physical attributes
1.312 A check list of critical linkage attributes
1.313 A check list of dynamic behavioral attributes
1.314 A check list of attributes or services (given weighted point scores)
1.315 Financial ratios measuring risk, such as cash break-even, rate of capital recapture, loan ratios or sensitivity to specified contingencies
1.316 Probability distributions of alternative outcomes and standard error of the estimate

1.317 Psychological gratifications
1.318 Specified legal attributes
1.319 Measures of impact on environment
1.320 Ad infinitum

1.320 The definition also implies uncertainty - a reasonable
likihood of succeeding. That statement is deliberately
short of a statistical probability statement. However,
analytical judgments can produce some verbal probability
statements (that horse is a nag while the black stallion
is an odds on favorite) so that the measures of success
should lend themselves to explicit recognition of the
degree of uncertainty with which success might be achieved.

1.330 To invest in real estate is to purchase a set of assumptions
and to see if the assumptions are acceptable, they should
be made explicit whenever possible.

1.340 Correct definition of the problem requires careful
definition of those items which are given in terms of
context and constraint and more than 50% of any feasibility
study is involved in correct specification of these
constraints. Subject matter of analysis of the context
would include:

1.341 Market trends and opportunity areas
1.342 Merchandising targets with monopoly characteristics
1.343 Legal-political constraints
1.344 Ethical-esthetic constraints
1.345 Physical-technical constraints
1.346 Financing constraints

1.350 The analyst must also identify and measure or define the
limited resources of the client in terms of personnel,
expertise, available cash resources, and the time line
of expectations and commitment since time available to
achieve the solution is often a critical resource and
constraint relative to alternative choices.

1.360 These basic elements and definitions then lead to a correct
title for the report required. Most feasibility reports
go wrong on the title page because the analyst did not
clearly understand to which elements of context and form
his report was to be addressed. Seldom does the analyst
do a complete feasibility study as a single report on
his own. Components may be provided by others and the
sequence of sets may differ in each case depending on
how the consultant understands the client. Therefore,
a report should be entitled as one of the following:

1.361 Strategy study: selection of objectives, tactics,
and decision criteria.
1.362 Market analysis: economic base studies or other
related aggregate data review.
1.363 Merchandising studies: consumer surveys, competitive
property analysis, marketability evaluation, etc.

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

1.365 Compatability studies of project to community planning, conservation standards, or other public policies.

1.366 Engineering, land planning, and architectural studies.

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

1.400 The original problem as perceived by the client is seldom the real issue of feasibility analysis that will need to be examined by the analyst. The appraiser is conditioned to having the client specify the function of the appraisal, such as for fire insurance or eminent domain and then having the client's attorney or the court jurisdiction define the definition of fair market value, the question which the appraiser then begins to answer.

1.410 However, the client may ask for an appraisal when he needs a feasibility study. He may ask what he should pay for a piece of property before he has determined that his strategic needs are best met by purchase rather than by leasing by avoiding ownership of additional space altogether (by subcontracting certain functions of others by the way in which he purchases services and supplies).

1.420 Since everyone is an expert on real estate the client will probably presume that a certain procedure will be followed. The architect will presume that the real estate expert will show the financial implications of a final design, when in fact the real estate expert should first assist in the pre-architectural program of design objectives. Almost every client will overlook some of the basic issues because of the natural bias of his position and what that position tends to encourage in what is taken for granted. The consultant must begin by attempting to discover what is taken for granted and that search will continue to condition his relationship with his client.

1.430 When the client first contacts the consultant the question provided by the client will conceal some implicit client preferences and assumptions. The consultant will need to interview his client by asking him explicitly about:

1.431 His preferred method of meeting entrepreneurial risk

1.432 His preferred method of personnel compensation

1.433 His style of value decision trade-offs between qualitative and quantitative issues.

1.434 His perception of his risk position and his risk utility "curve."

1.435 His personal non-business objective.

1.436 His reasons for being involved with real estate (a simple question revealing in most cases tremendous naivete and lack of indepth preparation by the client).

1.440   The client is often skeptical of the ability of the consultant to contribute anything new since he may regard the consultant as one "who tells him the time by reading the client's own watch." Moreover, he may be using the consultant to double check another source of information and therefore expects a consultant to begin from scratch as a way of confirming the original source. Nevertheless, the feasibility analyst must eventually extract from the client, preferably in writing, an agreement as to what the stated objectives of the study are and the input which will be provided by others than the analyst. This step will probably only be accomplished after the consultant has come to a better understanding of the real problems faced by the client.

1.500   The problem as perceived by the client almost always must be converted into a sequence of problems as understood by the consultant. The perceived question of "How much should I pay for the land," may first require a strategic restatement of "What are the client's objectives in going into land development and how are those best achieved given the context in which the client is operating?"

     1.510   The feasibility analyst should be the devil's disciple for in order to define what needs doing, he must first discover what has been done, what assumptions have been made, and whether those who made the assumptions knew what they were doing.

         1.511   A review of different feasibility report types with the client will begin to educate the client on the various facets of his real estate problem. (See 1.361-7)   The professional must make the client recognize the implicit program content initially assumed and he must challenge the initial explicit statements of purpose by the client.

         1.512   The analyst should stage his feasibility research to permit additional opportunities to interact with the client, giving the client opportunity for further self examination and the analyst opportunity to discover unacceptable alternative courses which need have no further research.

         1.513   The analyst must preserve the independence of his judgment by avoiding subcontracting positions with those such as an architect or mortgage banker who are advocates of a vested viewpoint or producing a report to solve the problem "obtaining a million dollar loan" if more fundamental economic questions remain unanswered.

EXHIBIT I

Feasibility Assignment and Accountability Worksheet
XYZ Appraisal Company
xxx Street   Anywhere U.S.A.

Name of Client_____   Date_____

Assignment Description_____

Feasibility Input	Provided by	Approved by	Sequence and date available
1. Definition of questions and strategic objectives			
2. Definition of success criterion			
3. Ranking of criteria by priority			
4. Definition of specific site			
5. Definition of market opportunity			
6. Space user profile			
7. Space consumer preference survey			
8. Space product definition			
9. Aggregate and market forecast and absorption rate			
10. Merchandising capture rate by product mix			
11. Legal and political constraints assumed for user and investor			
12. Site constraints and site development plan			
13. Architectural constraints and plans			
14. Environmental impact assumptions			
15. School district impact assumption			
16. Municipal infrastructure and revenue impact			
17. Aesthetic and social impact			
18. Land cost assumptions			
19. Improvement cost assumptions			
20. Indirect cost assumptions			
21. Operational cash-flow budget assumptions			
22. Income tax liability assumptions			
23. Financing and refinancing assumption			
24. Other			

Accepted by Client   _____
                              (Date)

EXHIBIT 2

APPRAISAL AS A FICTIONAL SET OF FEASIBILITY ASSUMPTIONS

Feasibility Analysis	Appraisal Analysis
Will the project really work for a specific investor?	What would the project sell for if it did work for a typical investor?

1. Objectives - decision standards provided by client decision process
   a. Maximize spendable cash of total enterprise
   b. Subjective gratification of specific individual
   c. Adaptation to enterprise management specialties and weaknesses

2. Aggregate market potential opportunity identification

3. Merchandising analysis (Defining competitive edge) and specific user profile

4. Legal-political context
   a. All legal constraints on site, seller, buyer, and user are considered
   b. What is legal is qualified by what is political

5. Physical-technical constraints are examined in terms of what might be

6. Impact on environment and community specifically forecast

7. Financing from buyer viewpoint considering all profit centers

8. Income tax advantages or disadvantages affecting spendable cash

9. Actual cash revenues and expenses forecasted for each period of time horizon

10. Limiting assumptions of solution
    a. Identification of potential variance and sensitivity of objectives to alternative futures
    b. Responsibility allocated among sources of expertise
    c. Budget & purpose of study edits information scope
    d. Format of analysis determined by structuring of data to lead to desired conclusion or recommendation

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1. Objectives - decision standards provided by theoretical framework
   a. Maximize economic surplus of individual parcel
   b. Prudent behavior of economic man
   c. Average management to isolate return to land & capital

2. Aggregate market potential business climate

3. Merchandising comparison (Defining standard competitive substitute)

4. Legal-political context
   a. Legality assumed
   b. Limited to site use rather than regulations on probable user as alternative buyers are assumed

5. Physical-technical constraints are studied as is or in terms of conventional uses

6. Impact on environment and community assumed acceptable within existing permitted uses

7. Financing from lender viewpoint considering only net income line and below

8. Income tax not considered except implicitly recognized in market comparison

9. Revenues and expenses generally normalized and projected on linear trend for standard period

10. Limiting assumptions of solution
    a. Average outcome without qualification as to alternative futures
    b. Responsibility denied for other areas of expertise
    c. Date of appraisal edits information scope
    d. Format of analysis defined by model of fair market value appraisal report

1.520 In search of the real problem as opposed to the initial problem perceived by the client, the analyst should retreat to some basic classification and task identification checklists. First there are only three alternative feasibility situations:

   1.521 A site or a project owned by a specific client in search of a market.
   1.522 An identified market segment or use in search of the site and project to be provided by a specific client.
   1.523 A specific client desiring to search for an opportunity in real estate enterprise.

1.530 Next the analyst must know the viewpoint of the audience for his report, written or oral, because the elements considered important by a mortgage lender may be significantly different than those of a general partner or those of a limited partner or those of a large tenant.

1.540 Since there are so many facets to the context of a real estate project and measurement of its success, not to mention the assumptions on which the determination of feasibility depends, it is important to have the client agree on what elements of feasibility are to be provided by which expert or analyst. It is useful to include a standard check list of components with a letter of proposal as that checklist later becomes the really significant portion of the statement of limiting conditions (hold harmless agreements) which are part of the final report. A sample of one such checklist is provided in Exhibit 1.

1.550 With a review of which elements are to be provided by which experts it then becomes possible to assist the client in choosing which report title or titles are properly the responsibility of the real estate analyst. (See 1.360)

1.560 With definition of the report expected and the information to be provided by others, the analyst can prepare a budget and a schedule for staging the report so that he and the client can begin to establish priorities both in time and money available for research to define the feasibility assignment on which the analyst is to proceed.

1.570 Obviously the interaction between client and feasibility analyst will require several meetings in most cases and is far more elaborate in custom tailoring a report than would be true of an appraisal assignment. This is so because an appraisal is simply a fictitious feasibility report where most of the critical assumptions are assumed away by conventional assumptions of appraisal methodology or the narrowness of the question implied by appraisal. See Exhibit 2 for significant differences between appraisals and feasibility assumptions.

1.600 Given the two basic feasibility situations - project in search of a market or market in search of a workable project, there are two basic financial approaches to feasibility analysis. These approaches provide an initial set of numbers and required financial constraints which must be tested against realities of the marketplace. Notice that these approaches reflect some appraisal truism:

1.610 Capital outlay approach:
Total project cost = mortgage balance + equity capital
Cash dividend on equity + debt service = net income
Net income + expenses + real estate tax + vacancy = required gross receipts
Required gross receipts/space units = rental price/unit

1.620 Market Revenue Approach:
Gross rents - vacancy + expenses = net income available for debt service + equity dividends
Gross rents x desired default point = maximum expenses and outlays
Break-even cash - expenses = income available for debt service
Income available for debt service/$1,000/year of loan debt service = maximum loan
Maximum loan + equity capital to be committed = total project budget

1.630 The most common assignment for the appraiser turned feasibility analyst is to test a full blown project proposal for feasibility. In these cases, the total purchase price or the site and building plans, product mix, and building cost have already been established by a developer or a disigner.

1.631 The question is then what income will be necessary to support the project success- fully given certain parameters of financing terms, equity dividends, operating expenses, vacancy rates, and break even levels of operation required or desired.

1.632 In short, a given capital budget must be converted to a first year proforma income statement.

1.633 It is much less preferable than beginning with a desired rent level and working back to the allowable building budget, the market in search of a viable project since there is so much less flexibility with structure and site fixed at the outset.

1.640 It should be noted that this method is not a cash flow projection but only a first year analysis before income tax considerations.

1.641   If the project won't work its first full
         year of operation, there is little sense
         in projecting future years of cash flow for
         the <u>initial</u> analysis.

1.642   When one set of numbers can be made to work,
         it is then possible to test the specific
         proposal for its fit to the risk management
         considerations of the investor, to the public
         impact constraints in the community, and to
         the self interest of the space user.

1.650 Both the capital and the market approaches are models
       which serve several functions at the outset of any
       feasibility study, for purchase of an existing project
       or design specification of a proposed one. Like all
       models they oversimplify the case and ignore income tax
       considerations and non-quantitative objectives of the
       client. Nevertheless at the start they perform several
       useful functions for the analyst:

1.651   The formulas edit the data necessary to specify
         the space-time product and to convert that
         product to money-time assumptions.

1.652   The process immediately focuses analysis on
         the testing of the critical assumptions for
         success, namely availability of the required
         rent or possibility of construction within
         the required budget. If a basic proforma
         statement cannot be made to work either there
         is a prima facie case that the project is not
         feasible or priorities of feasibility study
         are shifted to discovery of a lower cost
         building technique or of willingness by the
         ultimate consumer to pay more for certain
         unique features.

1.653   It permits the analyst to repeatedly adjust
         the assumptions in a search to bracket a range
         of workable solutions (alternative choices)
         and then seek the relevant market data which
         may rebut or support the assumption of the
         capital or market proforma model.

1.654   The capital and the market approach are the
         two components of a reversible equation which
         permits sensitivity analysis of the critical
         variable which are within the control, in
         part, of the investor-developer.

1.700 The capital or market approach is a concise model for commun-
       icating critical relationships to the client and the audience
       for whom the report is intended. Should the audience disagree
       with assumptions made by the analyst, the audience can then
       immediately test their own assumptions by the same logic as
       the analyst.

2.000   The capital outlay approach to feasibilty involves a series of steps <u>to determine rents required</u>, when risk management parameters, and total capital costs are known or can be assumed.

    2.100   The capital outlay approach is best demonstrated by reference to a worksheet which provides a step by step framework for analysis. (See <u>Exhibit 3</u> for demonstration case; a sample blank set of worksheets is at the back of study kit for later office use).

    2.200   Step 1 is to complete the capital outlay budget and determine total hard dollar costs of the project (line 260, Exhibit 3).

        2.210   If total dollar cost of acquisition is the only number known, start with line 260.

        2.220   Otherwise begin with gross sq. ft. of building costs for residential and multiply by gross area (line 110); repeat the process for commercial or other space and rename the categories if desired.

        2.230   The contingency reserve factor (line 200) is a risk allowance for an overrun in the cost of total structure. If you have assumed the highest cost imaginable, set it to 0; if construction costs are from an optimistic architect or contractor, the percentage of contingency reserve might be 10% plus an allowance for inflation if the building will not be built for a year or more.

        2.240   Consultant and developers fees and carrying charges (line 240, 250) can each be computed separately and summarized as a single number on the form to provide a check list for all of the elements which might be accounted for in a final detailed analysis. Note that construction loan costs are computed separately beginning with line 270.

    2.300   To allocate hard dollar costs between mortgage dollars and equity dollars the analyst must assume either a specific number of mortgage dollars or a percent of hard dollar costs which will be available from debt money (line 270). Note there may be a combination of mortgages so that the percentage factor is not a traditional loan ratio but the ratio of debt dollars to total hard dollar requirements.

CAPITAL OUTLAY MODEL WORKSHEET

Structures Cost

FHA 221(d)(4), 90% MTG.

Line	Description	Value 1	Value 2	Calculation	Reference
	Residential				
110	Gross sq. ft.	60500			Specify (Sp.) sq. ft.
120	Cost/gross sq. ft.		21 59		Sp. $'s/sq. ft.
130	Total Res. Structures	1306200		(60500×21.59)	Lns. (110 x 120)
	Commercial				
140	Gross sq. ft.	16000			Sp. sq. ft.
150	Cost/gross sq. ft.		18 35		Sp. $'s/sq. ft.
160	Total Comm'l Structures	293600		(16000×18.35)	Lns. (140 x 150)
170	Miscellaneous Structures	0			Sp. $'s
180	**Total Structures**	1600000		(1306200+293600)	Sum Lns. (130, 160, 170)
190	Contingency Reserve Factor		03		Sp. %
200	Contingency Reserve	48000		(1600000 x.03)	Lns. (130 x 190)
210	Total Structures and Reserves	1648000		(1600000+48000)	Sum Lns. (190 + 200)
220	Land	113500			Sp. $'s
230	Total Structures, Reserves, Land	1761500		(1648000+113500)	Sum Lns. (210 + 220)
240	Consultant/Developers Fee	50000			Sp. $'s
250	Carrying charges (tax, ins.)	25000			Sp. $'s
260	**Total Hard Cost**	1836500		(1761500+50000+25000)	Sum Lns. (230 + 240 + 250)
270	Mtg. @ % Total Hard Cost		90		Sp. %
280	Const. Loan @ % Tot. Hard Cost		90		Sp. %
290	Const. Period in Months		15		Sp. #
300	Const. Interest Rate		12		Sp. %
310	Const. Interest	123960		$(1836500 \times .90 \times \frac{15}{12} \times .12 \times \frac{1}{2})$	Lns. $(260 \times 280) \times (\frac{LN\ .290}{12}) \times (LN\ 300) \times (1/2)$
320	Financing fee @ % Mtg.		05		Sp. %
330	Financing Fees	91825		(1836500 x.05)	Lns. (270 x 320)
340	**Total Replacement Cost**	2052285		(1836500+123960+91825)	Sum Lns. (260 + 310 + 330)
350	Mortgage Capital Contribution	1652850		(1836500× .90)	Lns (260 x 270)
360	Required Equity Cash	399435		(2052285−399435)	Lns (340 – 350)

Required Revenue Budget

Unit Mix; # & code
(Code: Residential = 1, Commercial = 2)
(If Code 1, give # rooms; Code 2 sq. ft. GLA)

Line	Item	Value	Calculation	Note
370	RU - 1	1 46 1		Sp., # units & code
380	# Rooms (iff. residential)	3 5		Sp. # Rooms
390	RU - 2	10 1		Sp., # & Code
400	# Rooms	4 5		Sp. # Rooms
410	RU - 3	15000 2		Sp., # & Code
420	# Rooms			Sp. # Rooms
430	RU - 4			Sp., # & Code
440	# Rooms			Sp. # Rooms
450	RU - 5			Sp. # & Code
460	# Rooms			Sp. # Rooms
470	Total # Rooms, Res. RU's	206	(46×3.5)+(10×4.5)	Sum Lns [(370x380)+(390x400)+ (410x420)+(430x440)+(450x460)]

Expenses & Taxes
Residential

Line	Item	Value	Calculation	Note
480	Expenses/room/year	140		Sp. $'s
490	Taxes/room/year	160		Sp. $'s

Commercial

Line	Item	Value	Calculation	Note
500	Expenses/sq. ft.GLA/year	50		Sp. $'s
510	Taxes/sq. ft. GLA/year	1 00		Sp. $'s
520	Total Res. Exp. & Taxes	61800	(140+160)(206)	Ln (470) x Sum Lns (430+490)
530	Total Comm'l Exp. & Taxes	22500	(150)(5000)	Ln (370-460 Code 2 #s)(Sum Lns 500+ 510)
540	Total Exp. & Taxes	84300	(61800+22500)	Sum Lns. (520+530)
550	Mtg. Constant	0926 FHA		Sp. %
560	Mtg. Debt Service Required	153050	(1652850)(.0926)	Lns. (350 x 550)
570	Equity Cash Dividend Constant	08		Sp. %
580	Equity Dividend Required	31950	(399435)(.08)	Lns. 360 x 570)
585	Cash income required for Exp. & Tax, Mtg. & Equity	269300	(84300+153050+31950)	Sum Lns.(540+560+580)

Line	Description	Value	Calculation	Formula
590	Non-Distributable cash & variance factor	02		Sp. %
600	Non-Dist. cash & Var. Revenue	5385	(269300-(269300)(.98))	Ln(585)-(Ln[585])(1-Ln[590])
610	Required Annual Effective Gross Revenue	2.74690		Sum Lns (585 + 600)
615	Vacancy Factor	05		Sp. %
620	Required Annual Gross Revenue	289140	(274690÷.95)	Ln (610)/(1 - Ln 615)
625	Required Monthly Gross Rev.	24095	(289140÷12)	Ln (620)/12 months
630	# Non-allocated Price RU's	45		Sp. #
640	Mo. Income/RU's	15		Sp. $'s
650	Total Non-allocated RU Revenue	675	(45×15)	Lns. (630 x 640)
655	Allocatable Revenue	23420		Lns. (620 - 650)

(Note Factor Calculations: Refer to Unit Mix
Section Lns. (370-470)
If Type 1,(res) multiply # units by rent @ BRU
If Type 2,(comm'l);(Read sq. ft. RU and / by sq. ft. BRU (Ln 665)
        x (rent @ % BRU)

Line	Description	RU-1	Calculation	Formula
660	Base Revenue Unit Type			Sp. Type
665	Base Revenue Unit (BRU) sq. ft.	576		Sp. sq. ft.
670	RU - 1 rent @ % BRU	100		Sp. %
680	Factors	46	(46×1.00)	(See: Note Factor Code)
690	RU - 2 rent @ % BRU	1.40		Sp %
700	Factors	14	(10×1.40)	
710	RU - 3 rent @ % BRU	1.60		Sp %
720	Factors	41.67	(15000÷576×1.6)	
730	RU - 4 rent @ % BRU			Sp %
740	Factors			
750	RU - 5 rent @ % BRU			Sp %
760	Factors			
770	Total Factors	101.67	(46+14+41.67)	Sum Lns. (680+700+720+740+760)

Rental Structure

* If type 2 (or Comm'l), divide by Ln (665)

Line	Item	Value	Formula	Lns.
780	BRU rent/mo.	230 35		Lns.(655 / 770)
790	RU - 1 rent/mo	230 35	(1.00 x 230.35)	Lns.(670 x 780)*
800	RU - 2 rent/mo	322	(1.40 x 230.35)	Lns. (690 x 780)*
810	RU - 3 rent/mo	64	(1.60 x230)÷576	Lns. (710 x 780)*
820	RU - 4 rent/mo			Lns. (730 x 780)*
830	RU - 5 rent/mo			Lns. (750 x 780)*
840	Total Annual Rev. from RU - 1's	126960	(230x46x12)	Lns. (370 x 790)
850	Total Annual Rev. from RU - 2's	38640	(322x10x12)	Lns (390 x 800)
860	Total Annual Rev. from RU - 3's	115200	(.64x15000x12)	Lns. (410 x 810)
870	Total Annual Rev. from RU - 4's			Lns. (430 x 820)
880	Total Annual Rev. from RU - 5's			Lns. (440 x 830)
890	Total Annual Allocated Rev.	280800		Sum Lns.(840+850+860+870+880)
	(Compare to Ln. 655)x12			Lns. (890-655)
900	Default Ratio	82	(84300+53050+ 289140)	Lns. (540+560)/Ln (620)
910	Default Ratio, upset point			Sp. %

CAPITAL OUTLAY MODEL WORKSHEET

ALL EQUITY: No MTG.

Structures Cost

Residential

Line	Item	Value	Formula	Notes
110	Gross sq. ft.	60500		Specify (Sp.) sq. ft.
120	Cost/gross sq. ft.	21.59		Sp. $'s/sq. ft.
130	Total Res. Structures	1306200	(60500 x 21.59)	Lns. (110 x 120)

Commercial

Line	Item	Value	Formula	Notes
140	Gross sq. ft.	16000		Sp. sq. ft.
150	Cost/gross sq. ft.	18.35		Sp. $'s/sq. ft.
160	Total Comm'l Structures	293660	(16000 x 18.35)	Lns. (140 x 150)
170	Miscellaneous Structures	0		Sp. $'s
180	**Total Structures**	1600000	(≈ 1306200 + 293660)	Sum Lns. (130, 160, 170)
190	Contingency Reserve Factor	.03		Sp. %
200	Contingency Reserve	48000	(1600000 x .03)	Lns. (130 x 190)
210	Total Structures and Reserves	1648000	(1600000 + 48000)	Sum Lns. (190 + 200)
220	Land	113500		Sp. $'s
230	Total Structures, Reserves, Land	1761500	(1648000 + 113500)	Sum Lns. (210 + 220)
240	Consultant/Developers Fee	50000		Sp. $'s
250	Carrying charges (tax, ins.)	25000		Sp. $'s
260	**Total Hard Cost**	1836500	(1761500 + 50000 + 25000)	Sum Lns. (230 + 240 + 250)
270	Mtg. @ % Total Hard Cost	0		Sp. %
280	Const. Loan @ % Tot. Hard Cost	0		Sp. %
290	Const. Period in Months			Sp. #
300	Const. Interest Rate			Sp. %
310	Const. Interest			Lns. $(260 \times 280) \times \frac{(LN\ .290)}{12} \times (LN\ 300) \times (1/2)$
320	Financing fee @ % Mtg.			Sp. %
330	Financing Fees			Lns. (270 x 320)
340	**Total Replacement Cost**	1836500		Sum Lns. (260 + 310 + 330)
350	Mortgage Capital Contribution	0		Lns (260 x 270)
360	Required Equity Cash	1836500		Lns (340 - 350)

Required Revenue Budget
Unit Mix; # & code
(Code: Residential = 1, Commercial = 2)
(If Code 1, give # rooms; Code 2 sq. ft. GLA)

Line	Label	Val 1	Val 2	Val 3	Val 4	Formula / Description
370	RU - 1	46	1			Sp., # units & code
380	# Rooms (iff. residential)		35			Sp. # Rooms
390	RU - 2	10	1			Sp., # & Code
400	# Rooms		4.5			Sp. # Rooms
410	RU - 3	15000	2			Sp., # & Code
420	# Rooms					Sp. # Rooms
430	RU - 4					Sp., # & Code
440	# Rooms					Sp. # Rooms
450	RU - 5					Sp. # & Code
460	# Rooms					Sp. # Rooms
470	Total # Rooms, Res. RU's	206		(46x35)+(10x45)		Sum Lns [(370x380)+(390x400)+ (410x420)+(430x440)+(450x460)]

Expenses & Taxes
Residential

Line	Label	Val 1	Val 2	Val 3	Val 4	Formula / Description
480	Expenses/room/year		140			Sp. $'s
490	Taxes/room/year		160			Sp. $'s

Commercial

Line	Label	Val 1	Val 2	Val 3	Val 4	Formula / Description
500	Expenses/sq. ft. GLA/year			50		Sp. $'s
510	Taxes/sq. ft. GLA/year			1 00		Sp. $'s
520	Total Res. Exp. & Taxes	61800		(140+160)(206)		Ln (470) x Sum Lns (430+490)
530	Total Comm'l Exp. & Taxes	22500		(1.50)(15000)		Ln (370-460 Code 2 #s)(Sum Lns 500+ 510)
540	Total Exp. & Taxes	84300		(61800+22500)		Sum Lns. (520+530)
550	Mtg. Constant	0				Sp. %
560	Mtg. Debt Service Required					Lns. (350 x 550)
570	Equity Cash Dividend Constant		08			Sp. %
580	Equity Dividend Required	146920		(1836500)(.08)		Lns. 360 x 570)
585	Cash income required for Exp. & Tax, Mtg. & Equity	230220		(84300+146920)		Sum Lns. (540+560+580)

Line	Description	Value	Calculation	Reference
590	Non-Distributable cash & variance factor	02		Sp. %
600	Non-Dist. cash & Var. Revenue	4600	(230220-(230220)(.98))	Ln(585)-(Ln[585])(1-Ln[590])
610	Required Annual Effective Gross Revenue	234820	(230220+4600)	Sum Lns (585 + 600)
615	Vacancy Factor	05		Sp. %
620	Required Annual Gross Revenue	247180	(234820÷.95)	Ln (610)/(1 - Ln 615)
625	Required Monthly Gross Rev.	20600	(247180÷12)	Ln (620)/12 months
630	# Non-allocated Price RU's	45		Sp. #
640	Mo. Income/RU's	15		Sp. $'s
650	Total Non-allocated RU Revenue	675	(45×15)	Lns. (630 x 640)
655	Allocatable Revenue	19925	(20600-675)	Lns. (620 - 650)

(Note Factor Calculations: Refer to Unit Mix
Section Lns. (370-470)
If Type 1,(res) multiply # units by rent @ BRU
If Type 2,(comm'l);(Read sq. ft. RU and / by sq. ft. BRU (Ln 665)
    x (rent @ % BRU)

Line	Description	RU-1	Calculation	Reference
660	Base Revenue Unit Type	RU-1		Sp. Type
665	Base Revenue Unit (BRU) sq. ft.	576		Sp. sq. ft.
670	RU - 1 rent @ % BRU	100		Sp. %
680	Factors	46	(46×1.00)	(See: Note Factor Code)
690	RU - 2 rent @ % BRU	140		Sp %
700	Factors	14	(10×1.400)	
710	RU - 3 rent @ % BRU	160		Sp %
720	Factors	41 67	(15000×1.0÷576	
730	RU - 4 rent @ % BRU			Sp %
740	Factors			
750	RU - 5 rent @ % BRU			Sp %
760	Factors			
770	Total Factors	101 67	(46+14+41.67)	Sum Lns. (680+700+720+740+760)

Rental Structure

* If type 2 (or Comm'l), divide by Ln (665)

Line	Description	Value	Calculation	Formula
780	BRU rent/mo.	196	(19925÷101.67)	Lns.(655 / 770)
790	RU - 1 rent/mo	196	(196 × 1.00)	Lns.(670 x 780)*
800	RU - 2 rent/mo	274	(196 × 1.40)	Lns.(690 x 780)*
810	RU - 3 rent/mo	54	(196 × 1.60)÷576	Lns. (710 x 780)*
820	RU - 4 rent/mo			Lns. (730 x 780)*
830	RU - 5 rent/mo			Lns. (750 x 780)*
840	Total Annual Rev. from RU - 1's	108192	(46 × 196) × 12	Lns. (370 x 790)
850	Total Annual Rev. from RU - 2's	32880	(10 × 274) × 12	Lns (390 x 800)
860	Total Annual Rev. from RU - 3's	97200	(15000 × 54) × 12	Lns. (410 x 810)
870	Total Annual Rev. from RU - 4's			Lns. (430 x 820)
880	Total Annual Rev. from RU - 5's			Lns. (440 x 830)
890	Total Annual Allocated Rev.	238270	(108192+32880+97200)	Sum Lns.(840+850+860+870+880)
	(Compare to Ln. 655) × 12			Lns. (890-655)
900	Default Ratio	34	(84300÷247180)	Lns. (540+560)/Ln (620)
910	Default Ratio, upset point			Sp. %

2.310   Lines 280 to 330 provide an initial estimate of
         soft dollar costs for construction loan costs and
         other financing fees for registration, marketing
         research and points. These costs added to hard
         costs provide the total replacement costs, the
         same term used on line 73 of the FHA 2013 form.

2.320   The total replacement cost minus the mortgage
         amount from permanent financing (line 350)
         establishes the equity cash (line 360) that will
         be required once the project goes on stream
         as operational. Note that total replacement
         costs less the construction loan in line 280 will
         reveal the equity cash required during con-
         struction if all subcontractors are to be paid
         before the end of the construction phase.
         However, cash budgeting of the construction
         phase at that level of detail is premature at
         this point in the analysis.

2.400 It is then necessary to define space-time units by some
       common denominator appropriate to expense accounting as
       well. If there were only identical one-bedroom apartments
       in the structure, then the one bedroom apartment is an
       appropriate avenue unit (RU) as on line 370. However,
       if the project has a mix of apartment type, it is useful
       to redefine each type of rental unit in terms of some
       common denominator such as numberof rooms or number of
       sq. ft. or in terms of one bedroom units so that
       average expenses per room or per sq. ft. may be used.

2.410   The total number of common denominator units (line 470)
         in rooms, sq. ft., dormitory bed or whatever
         represents the residential units in order to
         simplify expense calculations on line 480 and
         490.

2.420   In most communiites it is possible to know the
         median real estate tax per room, sq. ft., or
         apartment, etc. and the expenses of roughly
         similar projects and these appropriate costs on
         lines 480, 490, 500 and 510, provide a total
         expense and tax cost for line 520.

2.430   The same process is repeated for commercial or
         non-residential rental units in the same project,
         (lines 500 and 510) on a sq. ft. leasable basis
         to arrive at total cash outlays for expenses and
         taxes attributable to those commercial areas in
         line 530.

2.440   Line 540 represents the total cash required annually
         for cash expenses and real estate taxes
         attributable to the rental units contemplated by
         the plan on which the capital budget was estimated.

2.500 The other major cash outlay is the dollar amount required for debt servicing. This dollar amount can be determined by assuming specific terms of interest, term of repayment, or annual mortgage constant which would be appropriate to the permanent financing assumed as a basis for mortgage amount in line 350, and is entered as a dollar amount in line 560.

2.510 Required equity cash on line 360 - if any, may also require an annual cash return (much like the Ellwood cash dividend); even if equity cash was equal to 0 or negative, the owners may require some cash return each year as one of the benefits of owner-ship so these annual dividend dollars should be included in line 580.

2.520 Cash income required annually for expenses and taxes, mortgages and equity owners is then summarized on line 585.

2.521 The cash income required is subject to some error in estimating and there may be certain cash sinking fund programs which are desirable, such as for replacement of furnishings in a motel or store fronts in a retail project which wise developers actually fund in hard dollars from annual operations.

2.522 These non-distributable cash and allowance for variance (line 590) when added to line 585 provide an estimate of required annual effective gross revenues in line 610.

2.530 Effective gross revenue is revenue which must be collected, after certain vacancy and collection losses. A percentage vacancy allowance must be substracted from 100% and the remainder divided in effective gross to determine the required potential annual gross revenue in line 620.

2.531 To reduce the potential annual gross revenue to a period more appropriate to the type of space unit contemplated and market rents, it is then necessary to divide annual gross by some factors such as numbered months to determine monthly rents, number of days for motel prices, or hours during which the business is open for the year for a tennis court or ice arena (see line 625).

2.532 Required period income should be reduced by revenues which are fixed or should not be allocated to the various revenue units pre-viously indentified on page 2 (line 630-650). The analyst then has the allocatable revenue per unit in line 655 from which rents can be

determined for each of the remaining mix of rentable units.

2.540 For the example given the base revenue type was the one-bedroom apartment with 576 sq. ft. of space and all other rental units were expressed in terms of this common denominator. It is therefore necessary to determine the equivalent of common denominator units represented by the product mix being tested.

2.541 For example, the two bedroom apartments were expected to rent for 140% of the one-bedroom apartment price and the commercial area was expected to rent at 160% of what was expected of the one-bedroom apartment. (The sq. footage in the one-bedroom provided an arbitrary base for conversion of GLA). If commercial were not a significant part of a project, revenue expected from such miscellaneous sources can be deducted from revenue to be generated from basic revenue units in line 650.

2.542 Given the sum of equivalent revenue unit factors (on line 770) it is then possible to divide the total into total allocatable revenue (line 655) to determine minimum monthly rent required for one-bedroom units. The minimum monthly rent multiplied by the previous common denominator factor in (lines 680, 700, 720, 740, and 760) then provides the monthly rents for each of the other rental unit mix components.

2.600 At this point the analyst can begin a series of "if, then" statements in order to select the next step in his analysis of a project in search of a market. The objective is to identify the fit of the key assumptions to the realities of the physical project and a potential market, always looking for the key misfit which makes the project as proposed unfeasible.

2.610 Some of the key questions would be:

2.611 Are required investment dollars available? If not, what financial elements could be changed to improve investment results and by how much? If investment structure is acceptable, what are the risks of variance in the critical assumptions?

2.612 Are required rents acceptable or appropriate for the market intended? If not it may be appropriate to try the market structure approach (See 3.000). If the rents are reasonable, analysis would shift to the marketability of the proposed product.

2.613 If cash outlays and returns are acceptable for private sector, then what is the impact on the cash flows of the public sector in terms of new revenues and new service costs?

2.700 Since a primary function of the analyst is to provide risk management input to a proposal, it is useful to describe the risk management function in more detail before continuing to test the capital structure approach further. Risk in the business situation is the variance between assumptions about the fact in the planning process and realizations in the execution of the program. The game of "what if" and the consequences of surprise is cheaper to play on paper while designing the project program.

2.710 There are two types of risk for concern:

2.711 Static risks are those contingencies or events which can only cause a loss and which are highly unpredictable in terms of frequency of occurrence and severity of loss. In large part they are beyond control of the risk taker such as fire, death, accident, or world political events. Often these risks can be shifted by insurance devices.

2.712 Dynamic risks are those contingencies or events which can cause a profit or a loss, such as drilling for oil, or selecting a stock of style apparel for a retailing outlet. In these cases success or failure is in a large part dependent on the amount of information, skills, and judgment of the risk taker, who is motivated in varying degrees by the pain of loss or the gains of success.

2.720 The primary objective of risk management is to conserve existing net worth and asset values, and the secondary objective is to realize future expectations of net income. The functions of risk management include:

2.721 Identification of significant exposures to loss.

2.722 Estimation of potential loss frequency and severity.

2.723 Identification of alternative methods to avoid loss.

2.724 Selection of a risk management method.

2.725 Monitoring execution of risk management plan.

2.730 The loss potential of each contingency must be examined in terms of three elements:

2.731 The <u>direct loss</u> is the result of physical destruction of property or cash necessary to correct the damage.

2.732 The <u>consequential loss</u> is the loss of income or opportunity as a result of the direct loss.

2.733 The extra <u>expense loss</u> which includes all additional costs necessary to bring the contingency under control of satisfy claims of third parties adversely affected.

2.734 For example, a fire in a retail store causes direct damage to the property, consequential loss of rental income, and the extra expense of managing the recovery and meeting third party suits for damages.

2.740 The methods available to the risk manager to reduce financial surprises of risk include:

2.741 Avoiding risk (exterior storage of inflammable liquids, no FHA projects, no spec building).

2.742 Reducing frequency of loss (fireproof construction, underwriting selection of mortgagor or tenant).

2.743 Reducing severity of loss (sprinkler system, low ratio mortgage, exculpatory clause for borrower).

2.744 Shifting the risk of future variance by contract (fire insurance, real estate tax escalator clause, fixed price subcontract).

2.745 Limiting liability (corporate shell, limited partnership law, joint venture agreement).

2.746 Hedging (sale and lease-back with option to buy, the mortgage as a straddle position in the real estate futures market).

2.747 Creating compensation incentives for performance (deductibles and experience rating for insurance, graduated commissions or equity participation for management).

2.800 Risk management analysis begins with several basic indices of tolerance for variation in financial assumptions of either the capital structure or market structure approach. These in turn lead to sensitivity analysis of variables within the control of the decision maker.

2.810 The default point is the critical cash break-even point to which operations must adapt expressed as a ratio to potential gross rent.

$$\frac{\text{cash expenses + real estate taxes + debt service + short term loans}}{\text{potential gross rent}}$$

2.811 A default point of 80% means that vacancy could be 20% or rents might be cut by 20% to achieve 100% occupancy or some combination.

2.812 Expressing expenses and real estate taxes as a percent of gross potential allows analysis of variance which might occur in these cash outlays before exceeding cushion provided by default point less normal vacancy.

2.813 A statement of debt service as a percent of gross rent provides a meaningful measure of the amount of debt which may be carried safely by the project or the terms of the loans necessary to maintain solvency in any particular period.

2.814 Default points may be relatively high for an FHA apartment project with subsidized rents, say 85%, or low for a luxury resort - say 55%, but these are judgments which must be made by the analyst or the client.

2.820 The maximum potential loss facing a developer-investor is his net cash investment plus extent of direct liability on project liabilities. This exposure can hopefully be reduced by cash taken out of the project operations, and tax savings through other income. The time it takes to reduce the peak cash exposure to zero is known as the payback period.

2.821 For example, many investors would insist in a payback period of five years or less since they regard the future beyond that point completely unforeseeable and the possible events adverse to their investment almost infinite.

2.822 Payback can be altered by changing the debt ratio, reducing the cost of the project, retaining more pre-operating profit centers, or modification of partner shares and timing of distribution.

2.823   It is important to note that even if the capital
structure approach suggests a rent structure
which may be acceptable in the market, the default
point (line 900) or the payback ratio (line 910)
of the capital structure may be unacceptable so
that it will be necessary to rework the assumptions
about loan ratio or equity dividend rate or cost
or variance in operating expenses in order to
achieve desired results.

2.830   Not all risks can be given financial perameters and then
neatly laid off through one financial device or another
but it is useful to make underlying assumptions about
the status quo explicit so that the decision maker has
some idea about the alternative outcomes which could
adversely affect the desired result or possibly, if
fully understood, lead to a rejection of present profits
because unpredictable future losses:

2.831   Private college dormitories depended on a college
administrative rule that students live in
supervised housing. If the rule is removed by
administrative fiat, what then?

2.832   A key industrial park tenant may require a five
year lease with renewal options. If the option
is not taken, what then?

2.833   A recent financial forecast about availability of
real estate financing in 1976 made the following
explicit assumptions:

"Assuming no renewal of Middle East hostilities
and a resulting oil embargo."

"Assuming a reduction of the inflation rate to
5% through effective federal government fiscal
and monetary programs."

"Assuming only moderate increases for construction
labor contracts in the summer of 1975."

2.900   The concept of rate of return has as many variations as there
are investors, but essentially it attempts to measure the
relationship of cash outlays to cash receipts over time.
Essentially it is a corollary of buy low and sell high with
an adjustment for elapsed time between the two transactions.

2.910   Perceived risk eventually influences the desired rate
of return but risk and investment yield are not directly
integrated. A high rate of return may be possible
because there is little equity cash and therefore a very
small maximum potential loss and short payback period.

EXHIBIT 4

JOHN H. NABORS, JR.

PROGRAM SUMMARY
DESIGN ANALYSIS PROGRAM

The Design Analysis Program is basically a method of determining a number of possible annual cash flows from a proposed income property based upon up to five different values of six different cash flow parameters:

    1 = Rental Rates   e.g. $6.50/sq ft/yr
    2 = Vacancy Rates   e.g. 10% of potential rental revenue
    3 = Expense Rates   e.g. $2.50/sq ft/yr
    4 = Financing Conditions   e.g. $9\frac{1}{2}\%$ 30 yrs paid monthly
    5 = Building Efficiency   e.g. 85% of gross space
    6 = Loan Ratios   e.g. 90% of construction and land costs.

The basic format used is that of a planning format of an annual cash flow proforma: Rental Revenue adjusted for a Vacancy Allowance less Operating Expenses and Debt Service, yielding Annual Cash Flow.

This basic format reflects a single set of conditions that result in a single cash flow quantity. Actual practice reveals that parameter 1, 2, and 3 will constantly vary between years and within the year. Parameters 4 and 6 will be negotiated prior to construction by the developer, while parameter 5 will be established in the design phase and adjusted somewhat with the initial leasing strategy.

During the planning phase of an income property, best estimates of the values of these six parameters are utilized to prepare a cash flow pro forma. The DESIGN ANALYSIS PROGRAM allows the financial analyst to vary each parameter throughout a range of values to study the effect upon the pro forma annual cash flow. With five different values for six parameters, there are exactly 361 different annual cash flows.

The program allows the analyst to produce a 5 by 5 table of annual cash flows by varying one or two of the parameters over a range of values while using a primary or basic value for each of the other parameters. In addition, the breakeven rental rates or the rates of return on initial equity are given for the corresponding cash flows.

The total cost of construction and land can be input to the program or can be calculated through the use of the Construction Cost Estimate subprogram. The total cost of the structure can be computed from per square foot costs, component structure costs, professional fees, and land costs. Interim interest costs for land and construction are both computed.

Date_____
Run #_____

RJE DATA FORM

Line # in DESRJE	Answer	Question by the Program
350	$_____	IS THERE A CONSTRUCTION DATA FILE? (If Answer is NO, delete lines 360,370,380)
360	$_____	CONSTRUCTION DATA FILE NAME?
370	$_____	LIST THE CONSTRUCTION DATA?
380	$_____	OUTPUT THE CONSTRUCTION COST SCHEDULE?
390	$_____	IS THERE A CASH FLOW DATA FILE? (If answer is NO, no more data is needed.)
400	$_____	NAME OF CASH FLOW DATA FILE?
410	$_____	LIST CASH FLOW DATA?
420	$_____	OUTPUT LOAN AND DEBT SERVICE CALCULATIONS?
430	$_____	OUTPUT ALL CASH FLOW TABLES?
440	$_____	OUTPUT SENSITIVITY TABLE?

EXAMPLES

Example 1: No construction file, do not list data file or debt service data; output all tables.

350	$NO
390	$YES
400	$ (file name)
410	$NO
420	$NO
430	$YES
440	$YES

Example 2: Construction and cash flow data files exist, output all data lists and tables.

350	$YES
360	$(file name)
370	$YES
380	$YES
390	$YES
400	$(file name)
410	$YES
420	$YES
430	$YES
440	$YES

CONSTRUCTION COST SCHEDULE
DATA INPUT – SHORT FORM

100 _____ , _____ , _____ , _____ Bldg ID#, Mo, Day, Yr

101 _____ 60 character title(ctrd)

102 _____ 60 character title(ctrd)

103 _____ Gross sq ft or Acreage in Tract

104 _____ Run Number

CONSTRUCTION COSTS: (use 201 and 202 or 203)

201 _____ , _____ Shell – sq ft, $/sq ft.

202 _____ , _____ Interior – sq ft, $/sq ft.

203 _____ , _____ Building – sq ft, $/sq ft

204 _____ , _____ , _____ Grade Parking-sq ft/space, spaces, $/sq ft.

205 _____ , _____ , _____ Structured Parking "   "   "   "

206 _____ Landscaping/Lighting Costs -$ or $/sq ft.

207 _____ Furniture, Fixture & Equipment "   "   "

208 _____ , _____ Sq ft, $/sq ft or 0,0

(209) _____ Title

210 _____ , _____ Sq ft, $/sq ft or 0,0

(211) _____ Title

212 _____ , _____ Sq ft, $/sq ft or 0,0

(213) _____ Title

214 _____ , _____ , _____ 0, $, or % of Shell & Interiors

(215) _____ Title

(216) _____ Title

(217) _____ Title

218 _____ Constr.Contingency-0, $, or % of Shell & Interior

301 _____ Architecture Fees   Enter 0, $

302 _____ Engineering Fees   or % of Subtotal

303 _____ Loan Origination Fees   of lines

304 _____ Legal & Closing Fees   201 – 218

305 _____ Taxes & Insurance

309 _____ , _____ , _____ Optionally titled fees and

310 _____ Title   costs: 0, $ or % of Subtotal

311 _____ Title   of line 201-218

312 _____ Title

401 _____ , _____ Constr Interim Int Rt, Constr.Period-Months

402 _____ , _____ Other expenses 0, $ or % of Subtotal

(403) _____ Title

(404) _____ Title

500 _____ Zero or $ Cost of Land (or use line 501)

501 _____ , _____ Cost of Land -sq ft or Acres, cost/unit

502 _____ , _____ , _____ Interim Land Cost-% of Land cost
Interest rt, months.

503 _____ , _____ , _____ Interim Land Cost "   "   "   "   "   "

504 _____ , _____ Interim Land Cost – $/month, months

505 _____ Other land costs-$ or % of Land Cost

Complete lines with ( ) only if corresponding data is non-zero.

INPUT FORM
CASH FLOW ANALYSIS

100 _____ 0 or 1   0= lines 101-107 required   1= use constr. data
101 *_____, _____, _____, _____ Building ID#, Mo., Day, Year
102 *_____ Title Line 1
        Description Line 1 up to 60 characteristics
103 *_____Title Line 2
104 *_____ Gross Square Footage in Tract
105 *_____ Gross Square Footage in Building
106 *_____ Total Construction Cost
107 *_____ Run Number
    *Items are entered only if value is 0   on Line 100

200 _____ Number of Rental Rates (1 to 5)
201 _____, _____, _____, _____, _____ Rental Rates in$/sq ft
202 _____ Number of Vacancy Rates (1 to 5)
203 _____, _____, _____, _____, _____ Vacancy Rates in %
204 _____ Annual Parking Income $ or 0
205 _____ Other Income $ or 0
206 _____ Number of Operating Expenses (1 to 5)
207 ___.____, _____, _____, _____, _____Operating Expenses in$/sq ft
208 _____ Number of Financing Conditions (1 to 5)
209 _____, _____,_____, _____, _____ Interest Rates (Annual %)
210 _____, _____, _____, _____, _____ Term in Years
212 _____ Number of Building Efficiency Rates (1 to 5)
213 _____, _____, _____,_____,_____ Efficiency Rates (% of Gross)
214 _____ Number of Cash Flow Tables (0 to 10)

215 _____, _____   Enter Parameters to be output
216 _____, _____   1 Rental Rate
217 _____, _____   2 Vacancy Rate
218 _____, _____   3 Operating Expense Rate
219 _____, _____   4 Financing Conditions
220 _____, _____   5 Building Efficiency
221 _____, _____   6 Loan to Cost Ratios
222 _____, _____
223 _____, _____   2XX ____ROW____, ___COLUMN___
224 _____, _____

230 _____ Number of Loan to Cost Ratios (1 to 5)
231 _____, _____, _____, _____, _____ Loan Ratios in %

240 _____ ● 1 or 2   1 = Breakeven Rental Rates   2 = Rates of Return

250 _____   10000

CONSTRUCTION COST ESTIMATE

150,000 SQ FT BUILDING - 6.333 AC SITE

CONSTRUCTION COST OF $ 30 PER SQ FT

DATE: 8/28/1974
BLDG: 6001
RUN : 1

CONSTRUCTION COSTS			DOLLARS
CONSTRUCTION-SHELL	150000 SQ FT AT $ 26.00	$	3900000
CONSTRUCTION-INTERIOR	150000 SQ FT AT $ 4.00	$	600000
GRADE PARKING	500 SPACES AT $ 525		262500
LANDSCAPING/LIGHTING			100000

SUBTOTAL CONSTRUCTION			4862500
ARCHITECTURE FEES	AT 4.0 PCT		194500
ENGINEERING FEES	AT 1.0 PCT		48625
LOAN ORIGINATION FEES	AT 1.0 PCT		48625
TAXES AND INSURANCE	AT 1.0 PCT		48625

CUMULATIVE SUBTOTAL			5202875

INTERIM INTEREST-CONSTRUCTION
$ 5202875 AT 12.0 PCT FOR 13 MO X .5   338187
DEVELOPER"S PROFIT   AT 2.0 PCT OF $ 5202875   104057
CONTINGENCY   AT 2.0 PCT OF $ 5202875   104057

TOTAL CONSTRUCTION COSTS   5749177

LAND COSTS

275865 SQ FT AT $ 3.95   1089669
INTERIM INTEREST-LAND
100.00 PCT OF $ 1089669 AT 12.00 PCT FOR 13.00 MO   141657
5.00 MONTHS AT $ 7132 PER MONTH   35660

TOTAL LAND COST   1266986

TOTAL LAND AND CONSTRUCTION COST   7016162

LOAN DATA FOR EACH SET OF FINANCIAL CONDITIONS

AMOUNT FINANCED $ 5612930   EQUITY $ 1403232

LOAN RATIO 80.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE
9.50	30.0	10.0903	566359
8.50	30.0	9.2270	517903
9.00	30.0	9.6555	541955
9.75	30.0	10.3099	578685
10.00	30.0	10.5309	591090

AMOUNT FINANCED $ 4911313   EQUITY $ 2104849

LOAN RATIO 70.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE
9.50	30.0	10.0903	495564
8.50	30.0	9.2270	453165
9.00	30.0	9.6555	474210
9.75	30.0	10.3099	506349
10.00	30.0	10.5309	517203

AMOUNT FINANCED $ 6314546   EQUITY $ 701616

LOAN RATIO 90.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE
9.50	30.0	10.0903	637153
8.50	30.0	9.2270	582641
9.00	30.0	9.6555	609699
9.75	30.0	10.3099	651020
10.00	30.0	10.5309	664976

AMOUNT FINANCED $ 7016162   EQUITY $ 0

LOAN RATIO 100.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE
9.50	30.0	10.0903	707948
8.50	30.0	9.2270	647379
9.00	30.0	9.6555	677444
9.75	30.0	10.3099	723356
10.00	30.0	10.5309	738862

PRØ FØRMA CASH FLØW TABLE

150,000 SQ FT ØFFICE BUILDING

6.333 ACRE TRACT - RICHARDSØN, TEXAS

FIXED PARAMETERS   PAGE   2 OF 5

SITE   :   275865 SQUARE FEET   DATE   9- 5-1974
BUILDING ;   150000 SQUARE FEET   BLDG   4444
EFFICIENCY: 85.00 PCT ØF GRØSS
REVENUE   : $ 8.50 PER SQ FT
VACANCY   :   10.00 PCT ØF LEASEABLE
ØTR INCØME: $ 0 ANNUALLY   RUN   1
EXPENSES : $ 2.50 PER SQ FT

ANNUAL CASH FLØWS

LØAN TØ CØST RATIØ

FINANCING	70.0PCT	80.0PCT	90.0PCT	100.0PCT
30YR 9.50PCF	161061	90266	19472	-51323
30YR 8.50PCF	203460	138722	73984	9246
30YR 9.00PCF	182415	114670	46926	-20819
30YR 9.75PCF	150276	77940	5605	-66731
30YR 10.00PCF	139422	65535	-8351	-82237

BREAKEVEN RENTAL RATES

LØAN TØ CØST RATIØ

FINANCING	70.0PCT	80.0PCT	90.0PCT	100.0PCT
30YR 9.50 PCT	7.10	7.71	8.33	8.95
30YR 8.50 PCT	6.73	7.29	7.86	8.42
30YR 9.00 PCT	6.91	7.50	8.09	8.68
30YR 9.75 PCT	7.19	7.82	8.45	9.08
30YR 10.00 PCT	7.28	7.93	8.57	9.22

PRO FORMA CASH FLOW TABLE

150,000 SQ FT OFFICE BUILDING

6.333 ACRE TRACT - RICHARDSON, TEXAS

FIXED PARAMETERS

SITE :	275865 SQUARE FEET	DATE 9- 5-1974
BUILDING :	150000 SQUARE FEET	BLDG 4444
EFFICIENCY:	85.00 PCT OF GROSS	
LOAN RATIO:	80.00 PCT OF $ 7016162	
EQUITY :	$ 1403232	
FINANCING :	30 YEARS 9.50 PCT	
OTR INCOME:	$ 0 ANNUALLY	RUN 1
EXPENSES :	$ 2.50 PER SQ FT	

ANNUAL CASH FLOWS

VACANCY ALLOWANCE

RENTAL RATES ANNUAL $/SQ FT	0. PCT	5.0PCT	10.0PCT	15.0PCT
$ 7.50	71141	23329	-24484	-72296
$ 8.00	134891	83891	32891	-18109
$ 8.50	198641	144454	90266	36079
$ 9.00	262391	205016	147641	90266
$ 9.50	326141	265579	205016	144454

PERCENTAGE CASH FLOW RETURN ON EQUITY

VACANCY ALLOWANCE

RENTAL RATES ANNUAL $/SQ FT	0. PCT	5.0PCT	10.0PCT	15.0PCT
$ 7.50	5.07	1.66	-1.74	-5.15
$ 8.00	9.61	5.98	2.34	-1.29
$ 8.50	14.16	10.29	6.43	2.57
$ 9.00	18.70	14.61	10.52	6.43
$ 9.50	23.24	18.93	14.61	10.29

PRO FORMA CASH FLOW TABLE

150,000 SQ FT OFFICE BUILDING

6.333 ACRE TRACT — RICHARDSON, TEXAS

FIXED PARAMETERS

SITE	:	275865 SQUARE FEET	DATE 9- 5-1974
BUILDING	:	150000 SQUARE FEET	BLDG 4444
EFFICIENCY:		85.00 PCT OF GROSS	
LOAN RATIO:		80.00 PCT OF $ 7016162	
EQUITY	:	$ 1403232	
VACANCY	:	10.00 PCT OF LEASEABLE	
OTR INCOME:	$	0 ANNUALLY	RUN 1
EXPENSES	:	$ 2.50 PER SQ FT	

ANNUAL CASH FLOWS

FINANCING PARAMETERS

RENTAL RATES ANNUAL $/SQ FT	30 YEARS 9.50 PCT	30 YEARS 8.50 PCT	30 YEARS 9.00 PCT	25 YEARS 9.50 PCT	30 YEARS 10.00 PCT
$ 7.50	-24484	23972	-80	-46605	-49215
$ 8.00	32891	81347	57295	10770	8160
$ 8.50	90266	138722	114670	68145	65535
$ 9.00	147641	196097	172045	125520	122910
$ 9.50	205016	253472	229420	182895	180285

PERCENTAGE CASH FLOW RETURN ON EQUITY

FINANCING PARAMETERS

RENTAL RATES ANNUAL $/SQ FT	30 YEARS 9.50 PCT	30 YEARS 8.50 PCT	30 YEARS 9.00 PCT	25 YEARS 9.50 PCT	30 YEARS 10.00 PCT
$ 7.50	-1.74	1.71	-.01	-3.32	-3.51
$ 8.00	2.34	5.80	4.08	.77	.58
$ 8.50	6.43	9.89	8.17	4.86	4.67
$ 9.00	10.52	13.97	12.26	8.95	8.76
$ 9.50	14.61	18.06	16.35	13.03	12.85

SENSITIVITY ANALYSIS
DESIGN ANALYSIS PROGRAM

Sensitivity testing is generally considered to be the study of
the changes in a dependent variable resulting from unit changes in
an independent variable. In the case of an income property, the
dependent variable will be the annual cash flows from the property
and the independent variables could be any one of the many variables
that have an effect on the cash flow. If the values of all the
variables but one are held constant, the effect of unit changes in
the one variable can be reflected in a change in annual cash flow.

The table CASH FLOW PRO FORMA USING PARAMETER NORMS reflects the
basic data and assumptions concerning the income property and
the resulting Annual Cash Flow and Rate of Return on Equity.

The table entitled SENSITIVITY TABLE reflects three basic sets
of information:

1. Basic Parameter Values
2. Effects on Annual Cash Flows of Unit Changes
   in Fixed Parameters
3. Equivalent Effects to Yield a $10,000 Increase
   in Annual Cash Flow.

The first set of information lists the values of each parameter
as reflected in the CASH FLOW PRO FORMA USING PARAMETER NORMS
table.

The second set reflects the effect upon annual cash flow and upon
the construction cost total from reasonable unit changes of all
of the Basic Parameter Values. This table then can be used to
analyze the effect on the annual cash flow by the changes in one
or more variables. More detailed uses of this data are discussed
on following pages.

The third set of data relates each of the parameters to the
arbitrary dollar increase in annual cash flow in order to better
equate functions that are not often related in the planning process.
Hence, the engineer can relate increases in capital expenditures
for building equipment to decreases in operating expenses. The
leasing agent can relate rental rates to building efficiency or
operating expenses. The developer can relate permanent interest
rates to loan terms or to percentage rentals to lenders. Examples
of these comparisons are discussed on the following pages.

CASH FLOW PLANNING
DURING THE DESIGN STAGE USING THE
SENSITIVITY TABLE

The data contained in the table entitled CASH FLOW PRO FORMA
USING PARAMETER NORMS and in the table entitled SENSITIVITY
TABLE can be used to estimate cash flows under conditions not
studied during the computer program analysis.

Using the basic data on the attached example, several problems of
the following nature can be solved:

Problem 1

What will be the effect on annual cash flow of decreasing the
permanent interest rate by 1/2%?
ANS: Increase annual cash flow by approximately $24,488*
      to $114,754.

      0.25% = $12,244. Therefore, 0.50% = 2($12,244)=$24,488.

Problem 2

What will be the effect of increasing the operating expense
by 10%?
ANS: Decrease annual cash flow by $31,875 to $58,391.
      10% of $2.50 = 25¢, which is 2.5 x 10¢.
      So, 2.5 x $12,750 - $31,875.

Problem 3

What will be the revised annual cash flow resulting from a
reduction of the vacancy rate to 5% and a reduction of annual
rental rates by 50¢ per square foot?
ANS: Vacancy reduction increases cash flow by $54,190
      Rental reduction decreases cash flow by -$57,375.

Pro Forma Cash Flow	$90,266
Vacancy Reduction	54,190
Rental Reduction	-57,375
Estimated New Cash Flow:	$87,081**

* Actual amount taken from other output data is $24,404.
** Actual amount taken from other output data is $83,891.

Problem 4

What will be the net effect on annual cash flow of an increase of $75,000 in construction cost and a reduction of $6000 per year in operating expenses?

ANS:
        Increase construction cost $ -8,948
        Decrease operati ng expense   6,000
        Net Increase in Annual Cash Flw $ 2,948

Problem 5

What will be the adjusted annual cash flow after a reduction in rental efficiency from 85% to 83% with a decrease in annual rental rates of $1.00 per square foot for half the building and no change for the balance of the building?

ANS:
        Pro Forma Cash Flow $ 90,266
        Decrease in Rental Rates by 50¢ -57,375
        Reduction in Efficiency by 2%   -15,450
        Estimated Net Cash Flow $ 17,441*

Problem 6

What will be the net effect of increasing the loan ratio from 80% to 85%, increasing vacancy by 5%, and increasing building efficiency by 2%?

ANS:
        Loan Ratio increases by 5% $ -35,397
        Vacancy Rate increase by 5%   -54,190
        Building Efficiency increased   15,450
        Net Effect on Cash Flow $ -74,137

Problem 7

What will be the net effect on the total construction cost and on the resulting cash flow from an increase in the construction period by two months?

ANS:
        Total Construction Cost increases by $ 73,822
        Annual Cash Flow decreases by $ 7,448

* Actual Cash Flow taken from other tables is $18,791.

CASH FLOW PRO FORMA USING PARAMETER NORMS

150,000 SQ FT OFFICE BUILDING

6.333 ACRE TRACT — RICHARDSON, TEXAS

```
DATE:   9/ 5/1974
BLDG:      4444
RUN :         1
```

```
GROSS SQUARE FEET IN BUILDING:        150000
BUILDING EFFICIENCY            :           85 PCT
NET LEASEABLE SQUARE FOOTAGE :        127500

LAND AND CONSTRUCTION COST : $     7016162
LOAN TO COST RATIO         :           80.0 PCT
ORIGINAL LOAN AMOUNT       : $     5612930

EQUITY REQUIREMENT         : $     1403232

PERMANENT INTEREST RATE    :            9.50 PCT
TERM OF LOAN                       30 YEARS

ANNUAL DEBT SERVICE        : $      566359
```

	ANNUAL DOLLARS
GROSS INCOME : 127500 SQ FT AT $ 8.50	1083750
LESS: VACANCY ALLOWANCE OF 10.00 PCT	108375
GROSS EFFECTIVE INCOME	975375
OPERATING EXPENSES: 127500 SQ FT AT $ 2.50	318750
NET OPERATING INCOME	656625
DEBT SERVICE (10.09 PCT CONSTANT)	566359
PRO FORMA CASH FLOW	90266

RETURN ON EQUITY   • 6.43 PERCENT !

SENSITIVITY TABLE

150,000 SQ FT OFFICE BUILDING

6.333 ACRE TRACT - RICHARDSON, TEXAS

FIXED PARAMETERS		PAGE 3 OF 4

```
SITE        :      275865 SQUARE FEET        DATE    9- 5-1974
BUILDING    :      150000 SQUARE FEET        BLDG       4444
EFFICIENCY:     85.00 PCT OF GROSS
LOAN RATIO:     80.00 PCT OF $    7016162
EQUITY      :  $   1403232
FINANCING   :     30 YEARS    9.50 PCT
REVENUE     :  $   8.50 PER SQ FT
VACANCY     :     10.00 PCT OF LEASEABLE
OTR INCOME:   $          0 ANNUALLY         RUN           1
EXPENSES    :  $   2.50 PER SQ FT
CONSTRUCTION AND LAND COST    7016162
CONSTRUCTION INTERIM RATE     12.000 PCT
CONSTRUCTION PERIOD    13 MONTHS
LAND INTERIM RATE IS 12.00 PCT
```

EFFECT OF UNIT CHANGES IN FIXED PARAMETERS

PARAMETER CHANGE	INCREASE IN CASH FLOW	EFFECT ON CONSTRUCTION
DECREASE CONSTRUCTION COST $ 100,000	11930	-118235
DECREASE CONSTRUCTION $ 1.00 PER SQ FT	17895	-177352
DECREASE CONSTRUCTION PERIOD 1 MONTH	3724	-36911
DECREASE CONST AND LAND INTERIM 1 PCT	4035	-39987
INCREASE BUILDING EFFICIENCY 1 PCT	7725	
DECREASE RENTAL RATE $ .10 PER SQ FT	11475	
DECREASE VACANCY RATE 1PCT	10838	
DECREASE OPERATING RATE $ .10 PER SQ FT	12750	
DECREASE PERMANENT RATE .25PCT	12244	
DECREASE PERMANENT LOAN TERM BY 1 YEAR	-3514	
DECREASE PERMANENT LOAN TERM BY 5 YEARS	-22121	
DECREASE THE LOAN RATIO BY 5 PERCENT	35397	

EQUIVALENT EFFECTS TO YIELD
A $ 10000 INCREASE IN ANNUAL CASH FLOW

```
DECREASE CONSTRUCTION COST BY $      .56 PER SQ FT
DECREASE CONSTRUCTION PERIOD BY    2.7 MONTHS
DECREASE INTERIM INTEREST BY   2.48 PCT
INCREASE BUILDING EFFICIENCY BY  1.29 PCT
INCREASE RENT RATE BY $     .09 PER SQ FT
DECREASE VACANCY BY      .92 PCT
DECREASE EXPENSE RATE BY $    .08 PER SQ FT
DECREASE PERMANENT RATE BY    .20 PCT
INCREASE PERMANENT LOAN TERM BY  2.3 YEARS
DECREASE LOAN RATIO BY  1.4 PERCENT
```

COMMENTS ON THE USE OF THE UNIT CHANGE FACTORS

This technique is often very useful for quick assistance in estimating cash flows without numerous recalculations. Several problems cannot be satisfactorily solved by this method when unit changes of more than one interdependent variable are calculated. The following variables are interdependent:

        Rental Rates........Vacancy Rates
        Rental Rates........Building Efficiency
        Expense Rates.......Building Efficiency

There are 15 different pairs of two parameters, three of which are interdependent; thus, 12 sets are independent. As long as the above three parameters are not varied together, the sums of effects on cash flow are correctly additive as in Problem 4 and 6. When these variables are varied together, their interdependency results in an error as in Problems 3 and 5. This error will usually be fairly small unless the parameter is varied by a large multiple of the unit change.

There are 20 sets of three parameters, 10 of which contain inter-dependent parameters. Therefore, many of the combinations of parameters will yield errors in calculating cash flow in this manner.

When one parameter is varied by unit amounts, the correct annual cash flow can be calculated for all unit changes for all parameters except the financial parameters--rate and term. For this reason, the SENSITIVITY TABLE lists the effect of five-year and one-year reductions in the loan term.

2.920   There are two ways of measuring returns, <u>prospectively</u> one year at a time, or <u>retrospectively</u> over the full span of the investment cycle. A cash-on-cash return is a common example of the former while the internal rate of return, discounted cash flow, or the Ellwood approach are examples of the latter.

2.930   A cash dividend or equity cash throw-off approach before adjustment for income tax influence is the most useful approach in the early stages of feasibility analysis. Most people should have learned by now the fallacy of "tax loss only" deals which are not viable on their own.

   2.931   An equity dividend constant was built into the rent structure (line 580). This is a cash-on cash prospective return and is also a measure of the strength of the vested interest of the borrower continuing to make mortgage payments on time.

   2.932   Cash-on-cash is also the reciprocal of pre-tax payback of equity capital investment. For example, an 8% cash dividend is a 12:1/2 year payback before adjustment for tax savings, future refinancing surplus, profit centers retained, or "funny money" strategies to remove equity cash dollars.

2.940   Internal rate of return or discounted cash flow analyses will be postponed until seciton 5.000 where they will be considered as part of the "fine tuning adjustments" to the feasibility process.

2.950   Sensitivity analysis explores the change in one assumption on the relationships of the capital structure approach to various key assumptions about casot to acquire or operating revenues and expenses. It should be apparent that the repetitive nature of these types of automated computation and sensitivity analysis is best demonstrated by reference to one of the models which are commercially available.

   2.951   <u>Exhibit 4</u> contains a descriptive manual of a computer terminal service call Design Analysis Program, authored by John Nabors of Dallas, Texas. Special variations are available for hotel type or land development type formats.

   2.952   Similar types of program are available on high memory capacity electronic calculators. For example, the Monroe Calculator Company offers a series of feasibility programs developed by a real estate consultant-appraiser McCloud B. Hodges, Jr., MAI, of McLean, Virginia.

3.000 **Market Revenue Model Worksheet**

The market revenue approach to feasibility involves a series of steps to determine the maximum allowable replacement costs of a project when risk management parameters and gross potential gross rents are known or can be assumed.

3.100   The market revenue approach is best demonstrated by reference to a worksheet which provides a step-by-step framework for analysis (see Exhibit 5 for demonstration; a sample blank set of worksheets is at the back of the study kit for later office use).

3.200   Step 1 is to decide if the monthly rental structure is known for each type of revenue unit (RU) or if it is first necessary to establish the rental relationship among various revenue units in the product mix.

       3.210   If rental structure is known, start with line 350; if only total potential revenue from old sources is known, start with line 460 - the objective of all calculations to that point.

       3.220   Otherwise first separate non-allocated or fixed revenue by specification in line 110 or computation through lines 120-140. Note that non-allocated revenue is stated as an annual figure.

       3.230   To allocate revenue among different types of rental units or to test alternative product mix, it is desirable to define each revenue unit type in terms of a single common denominator such as room, sq. ft. of GLA, or even an apartment unit such as standard one-bedroom unfurnished apartment plan A. Lines 160-340 provide a worksheet for stating these relationships but are not necessary for a preliminary analysis. Note that codes 1 & 2 allow the analyst to distinguish between GLA and other types of revenue base units.

3.300   Step 2 is to determine the total operating expenses and real estate taxes which might be expected for the rental mix in question. The worksheet assumes the common denominator for residential is the same RU used in lines 180-240 or 360-410 and shifts to gross usable area for commercial development. The proper unit is whatever the analyst wishes to use that relates to his expense data information and provides some sensitivity to different possible product mixes in various projects.

       3.310   Fixed expenses in line 470 and special expenses provide opportunity to distinguish between basic expenses and special services which the developer might like to include (say maid service or special guest rooms) which may not be affordable and would be dropped in subsequent calculations on the worksheet.

MARKET REVENUE MODEL WORKSHEET

RENT BRU @ $210/MO.

Line	Description						Answer
100	Do you know complete rental structure? (If yes, go to line 350)	No					Answer
110	Non-Allocated Revenue						
120	Non-Allocated Revenue Units (RU's)	45					Specify (Sp.) #
130	Monthly Revenue/non-allocated RU	15					Sp. $'s
140	Total Annual Non-allocated Revenue	8100	(45×15×12)				Lns (120 x 130 x 12) Sp. $'s
150	Allocated Revenue						
160	Base Revenue Unit (BRU) Type	RU-1 1 bd					Specify Type
170	BRU sq. ft.	576					Sp. #
180	Relationship of RU's						
190	(Code: 1 = residential RU; 2 = commercial RU)						
200	RU - 1, specify code, rent @ % BRM	100					Sp. code, %
210	RU - 2, specify code, rent @ % BRM	140					Sp. code, %
220	RU - 3, specify code, rent @ % BRM	160					Sp. code, %
230	RU - 4, specify code, rent @ % BRM						Sp. code, %
240	RU - 5, specify code, rent @ % BRM						Sp. code, %
250	Unit Mix						
260	(if code 1 residential, specify # units,# rms (if code 2 commercial, specify sq. ft. GLA)						
270	RU - 1	46	35				Sp. # RU's, # rooms
280	RU - 2	10	45				Sp. # RU's, # rooms
290	RU - 3	15000	—				Sp. # RU's, # rooms
300	RU - 4						Sp. # RU's, # rooms
310	RU - 5						Sp. # RU's, # rooms
320	Total # of residential (code 1) RU's	56	(46+10)				Sum # code 1's, Lns(270 to 310)
330	Total # of residential (code 1) rooms	206					Sum # code 1;(# units)x(# rooms)
340	Total # commercial sq. ft. GLA	15000					Sum # code 2's Lns(270 to 310)

*Note: Lns (370 to 410);divide by Ln. 170 if code 2

Rental Structures

Line	Description	Value	Calculation	Formula
360	BRU rent/mo	210		Sp. $'s
370	RU - 1 rent/mo*	210	(210×100%)	Lns (200 × 360)
380	RU - 2 rent/mo	294	(210×140%)	Lns (210×360)[÷ by Ln 170 if code 2]
390	RU - 3 rent/mo	.58		Lns (220×360)[X by Ln 170 if code 2]
400	RU - 4 rent/mo			Lns (230×360)[X by Ln 170 if code 2]
410	RU - 5 rent/mo			Lns (240×360)[X by Ln 170 if code 2]
420	Total annual revenue from RU - 1's	115920	(46×210×12)	Lns (270×370)
425	Total annual revenue from RU - 2's	35280	(10×294×12)	Lns (280×380)
430	Total annual revenue from RU - 3's	104400	(15000×.58×12)	Lns (290×390)
435	Total annual revenue from RU - 4's			Lns (300×400)
440	Total annual revenue from RU - 5's			Lns (310×410)
445	Total annual revenue from res. RU's	151200	(115920+35280)	Sum Lns (420 to 440) code 1's
450	Total annual revenue from comm'l RU's	104400		Sum Lns (420 to 440) code 2's
455	Potential annual allocated revenue	255600	(151200+104400)	Sum Lns (445+450)
460	Total Potential Revenue from all Sources	263700	(255600+8100)	Sum Lns (140+455)

Expenses and Taxes

Residential

Line	Description	Value	Calculation	Formula
470	Fixed Expenses/room/year	130		Sp. $'s
480	Special Expenses/room/year	10		Sp. $'s
490	Taxes/room/year	160		Sp. $'s
500	Commercial			
510	Expenses/sq.ft.GLA/year	50		Sp. $'s
520	Taxes/sq.ft.GLA/year	100		Sp. $'s
530	Total Residential Exp. & Taxes	61800	(300 × 206)	[Sum Lns (470+480+490)][Ln(330)]
540	Total Commercial Exp & Taxes	22500	(150×15000)	[Sum Lns (510+520)][Ln (340)]
550	Total Expenses & Taxes	84300	(61800+22500)	Sum Lns (530+540)
560	Default Ratio	80		Sp. %
570	Cash Available for Debt Service	126660	(263700×80)-84300	[Ln 460x Ln(560)] - Ln 550
580	Potential Cash Available for Variance, Vacancy, Equity	52740	(263700-84300-126660)	Lns (460-550-570)

Mortgage Determination

Line	Description	Value	Calculation	Reference
590	Mtg. constant	.0926		Sp. %
600	Mtg. Capital Contribution	1367820	(126660 ÷ .0926)	Lns (570/590)
610	Vacancy Factor	05		Sp. %
620	Vacancy Cash Loss	13185	(263700 x .05)	(Ln 610)(460)
630	Non-Distributable Cash & Variance Factor	02		Sp. %
640	Non-Distributable Cash Reserve	5274	(263700 x .02)	(Ln 640)(460)
650	Cash Available for Equity Dividend	34081	(52540 - 13185 - 5274)	Ln580 - (620+640)
660	Equity Cash Dividend Constant	08		Sp. %
670	Equity Cash Investment	426010	(34081 ÷ .08)	Ln 650/660
680	Total Replacement Cost (TRC) Budget	1793830	(1367820 + 426010)	Sum Lns (600+670)
690	Construction Period (in months)	15		Sp. #
700	Construction interest rate	12		Sp. %
710	Construction Interest	102590	(367820 x .5 x 1.25 x .12)	[Ln(600)][(1/2)(Ln.720)Ln.700)] / (12 mo)
720	Financing fees @ % Mtg.	05		Sp. %
730	Financing fees	68390		Lns (600 x 720)
740	Carrying Charges	25000		Sp. $'s
750	Consultant/developers fees	50000		Sp. $'s
760	Total Hard Dollar Budget	1547850	(1793830 - (102590 + 68390 + 25000 + 50000))	Lns (680 - (710+730+740+750)
770	Land	113500		Sp. $'s
780	Off-site Improvements	0		Sp. $'s
790	Total Structures & Reserves	1434350	(1547850 - 113500)	Lns 760 - (770+780)
800	Contingency Reserve or Factor	03		Sp. %
810	Architect-Engineering Fees or Factor	05		Lns (790x800)
820	Total Hard Dollar Structures Budget	1319600	(1434350 - 114750)	Lns 790 - (800+810) or 790 - (800+810 x790)
830	Non-allocated	0		Sp $'s
840	Total allocated structures budget	1319600		Lns (820-830)
850	Gross residential sq. ft.	60500		Sp. #

Line	Description	Value		Calculation	Reference
860	Gross commercial sq. ft.	16 000			Sp. #
870	Cost/commercial sq. ft. @ %/residential		85		Sp. %
880	TOTAL ADJUSTED SQ. FT.	74 100		(60500)+(16000 x.85)	Ln (850) + Lns (860+870)
890	$'s/residential sq. ft.	17	81	(1319600 ÷ 74100)	Lns (840/880)
900	$'s/commercial sq. ft.	15	14	(17.81 x.85)	Ln (900x870)
910	Total Residential Structure Budget	1 077 505		(60500 x 17.81)	Lns (850x890)
920	Total Commercial Structure Budget	242 240		(16000 x 15.14)	Lns (870x900)
		1 319 745			

3.320 At a preliminary stage it may be possible to assume total expenses and taxes (line 550) to be a specific percentage of line 460 and omit calculations from lines 470-540.

3.400 A default ratio must then be specified (line 560) appropriate to the volatility of revenue or risk capacity desired for the project.

3.410 The default ratio times total potential revenue (line 460) then reveals the total cash normally available for expenses, real estate taxes and debt service. Subtracting total expenses in line 550 yields the total cash available for debt service.

3.420 The total potential revenue minus expenses and debt service indicates cash available for allocation to vacancy losses, potential increases in expenses and taxes, and cash dividends to equity.

3.500 Page 3 of the worksheet is intended to estimate the debt and equity structure which might be supported by the forecasted revenue stream.

3.510 The key is to determine the amount of mortgage money available for permanent financing.

3.520 For pre-tax cash flow analysis all that is needed is the annual mortgage debt service constant (line 590) appropriate to financing terms to be sought or available. This constant is 12 times the monthly payment per $1000 divided by 1000 for fixed term loans, as stated by the lender for constant payment loans, as stated by FHA for available insured loans, or can be calculated as a weighted average of the terms for several mortgages combined.

3.530 Dividing the constant (line 590) into cash available for debt service (line 570) will determine the total face amount of mortgage capital which can be supported by the project at an acceptable break-even point.

3.540 For after tax analysis it would be necessary to distinguish between interest and principle payments, a refinement best done with electronic data processing.

3.600 To determine the equity capital contribution it is necessary to define cash available for equity dividends by reducing line 580 for vacancy losses and a cushion for variance in estimates. It may also be desirable to establish non-distributable cash reserves for certain types of properties.

3.610 Vacancy factor as a percent of total potential revenue in line 460 is specified in line 610 to produce a vacancy cash loss in line 620.

3.620 A factor for non-distributable cash and variance
       in vacancy estimates can be introduced in line 630
       as a percent of the line 580 item, an optional
       adjustment.

3.630 Potential cash of line 580 is then reduced by
       vacancy loss (line 620) and non-distributable cash
       line 640 to define cash available for equity dividends
       in line 650.

3.640 The desired equity cash dividend rate or constant
       is then specified in line 660 and divided into
       cash available (line 650) to determine the maximum
       equity cash investment justified under the conditions
       outlined.

3.650 The total replacement cost or justified investment
       value (line 680) is the sum of the supportable
       mortgage capital contribution (line 600) and the
       total justified equity cash adjustment (line 670).
       It is then desirable to allocate the total capital
       budget among various components to arrive at a
       budget for structures, etc.

3.700 To reduce the total investment budget to the total hard
       cost budget, it is necessary to remove indirect costs for
       construction financing, carrying charges and consultant
       development fees.

3.710 Construction loan interest requires an estimate of
       the construction period in months (line 690), the
       construction loan interest rate (line 700) per
       year and the assumption that one half of the
       construction loan would be outstanding on the
       average during the construction phase. The worksheet
       further assumes that the construction loan is
       equal to the permanent mortgage amount determined
       in line 600 but the analyst could reduce this
       assumption as appropriate.

3.720 In addition to the construction interest calculated
       in line 710, financing fees as a percent of the
       loan amount (or points) can be specified in line 720
       and the dollar amount entered on line 730.

3.730 Miscellaneous carrying charges including real estate
       taxes and insurance can be specified as a dollar
       amount in line 740.

3.740 Consultant and developer fee can be specified in line 750.

3.750 When these indirect charges are subtracted from total
       justified replacement cost (line 680) it is possible
       to state the total hard cash dollar budget available
       for land, construction, and contingency reserves in
       line 760.

3.760 Given a specification for a land cost in dollars (line 770) it is then possible to determine total budget for structures and contingency reserves in line 790.

3.770 Specification of a contingency reserve percentage for construction costs or a dollar amount in line 800 and specification of architect-engineering commission rate or dollar amount in line 810 then makes it possible to isolate the total hard dollar budget for structural improvements (line 820).

3.800 Structural hard dollar budgets are more meaningful if distributed among various types of space uses for mixed use projects. The worksheet demonstrates one possible allocation between residential and commercial space but the analyst may choose to make his allocations on some other basis such as between site improvements, structure and furnishing - whatever is appropriate to the problem. Remember models must change as the questions requiring answers change.

3.810 Total hard dollar structure budgets should first be reduced by non-allocated costs appropriate for common items such as site improvements or special off-site improvement costs or for spaces producing income that were unallocated in line 140.

3.820 The remaining allocated structures budgets in line 840 can then be distributed by allocating among gross sq. ft. of space of different uses. On the worksheet commercial sq. ft. is adjusted by a factor to make it equivalent to residential sq. ft. For example, unfinished commercial space might cost only 80% of residential space so that in effect one could build 1.25 sq. ft. of commercial area for the same number of dollars required to build one sq. ft. of finished residential. The total adjusted sq. ft. is entered in line 890.

3.830 The dollars per sq. ft. determined in 890 and 900 or the total budgets in 910 and 920 become part of the pre-architectural constraint on the design. If these numbers are obviously unattainable based on the experience of the analyst or other professional advice, there is immediately a problem of examining the assumptions, the rental structure and the product size. Or a return to the capital structure approach could determine what rents might work for the costs in question.

3.900 The input for the market revenue approach and the test of the capital structure approach both depend on a thorough analysis of the market and motivations of the consumer relative to the client. (See 4.000)

3.910　Detailed analysis of a market will permit the analyst to make "if/than" statements based on the result of the market revenue worksheet above.

3.920　Where no site has been selected and general construction costs are known, it would be possible to modify the worksheet slightly to solve for the allowable land cost which would then become a guide for site selection and purchase, a process not unlike the land residual approach in appraisal.

3.930　For existing buildings where market rents are known the market revenue approach produces a justified capital investment which can be subtracted from cost to replace new to determine economic obsolescense of project.　　It provides a useful support to a tax assessment challenge where the assessor has rightly or wrongly used the cost approach.

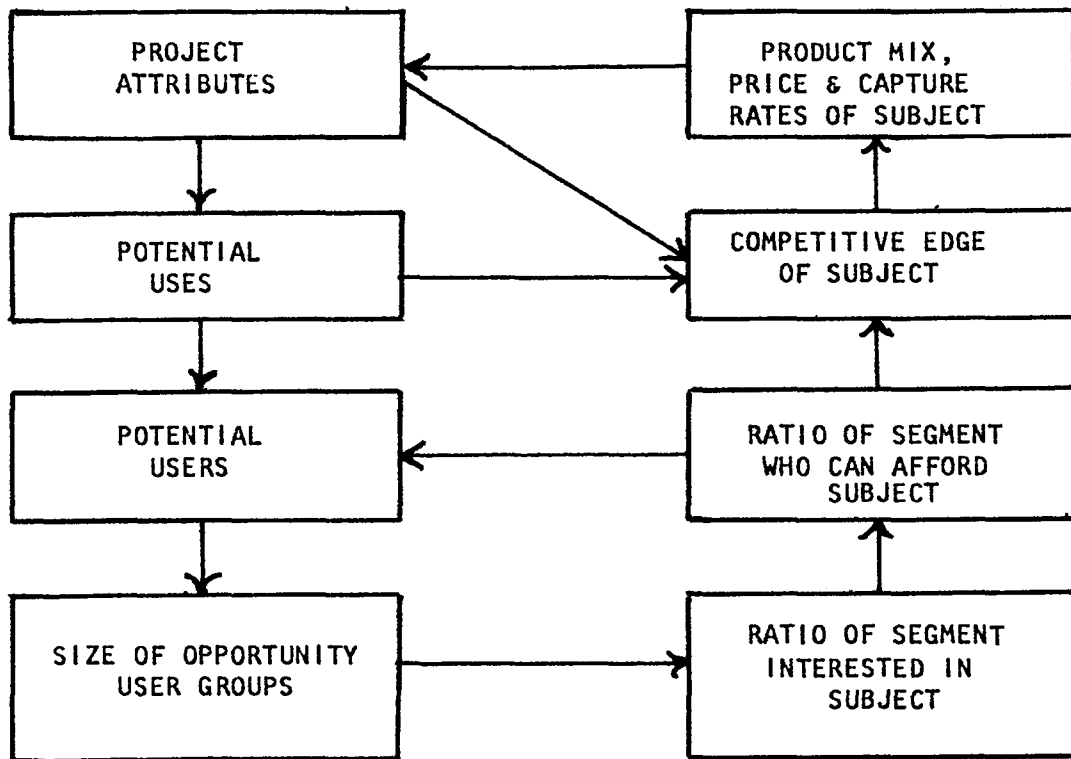4.000　Real Estate Market and Merchandise Analysis

Marketing research provides the key input for the market revenue worksheet and the key tests as to the acceptability of the conclusions based on the capital outlay worksheet. Since there is more plausible but overly general data in most cases than one can use, market and merchandising analysis both require a systematic approach which will discard most of the data as irrelevant at any particular time and focus the remaining information on a specific problem.

4.100　Most feasibility cases require the analyst to create his own models with which to structure the data available and the data which must be researched.

4.110　Remember, models organize the analyst, the report, and the client.

4.411　Models explain what you are going to do
4.412　Models make relationships and key assumptions explicit
4.413　Models permit clients to understand logic of conclusion and to test his own set of assumptions.

4.120　A market research model should be careful to recognize:

4.121　What are the questions?
4.122　What data is available which is relevant?
4.123　What theory is available to focus data on the questions?
4.124　How will the results be communicated?
4.125　What are the abilities of the analyst?
4.126　What is the cost benefit ratio between the model method and the question?

4.130　Market data refers to aggregate data, secondary information, the easy to acquire data from census tracts, traffic counts, building permits, and so on.

It is useful to scale the size of the market potential, of the opportunity area but by itself aggregate market data is relatively unimportant to the success of most projects.
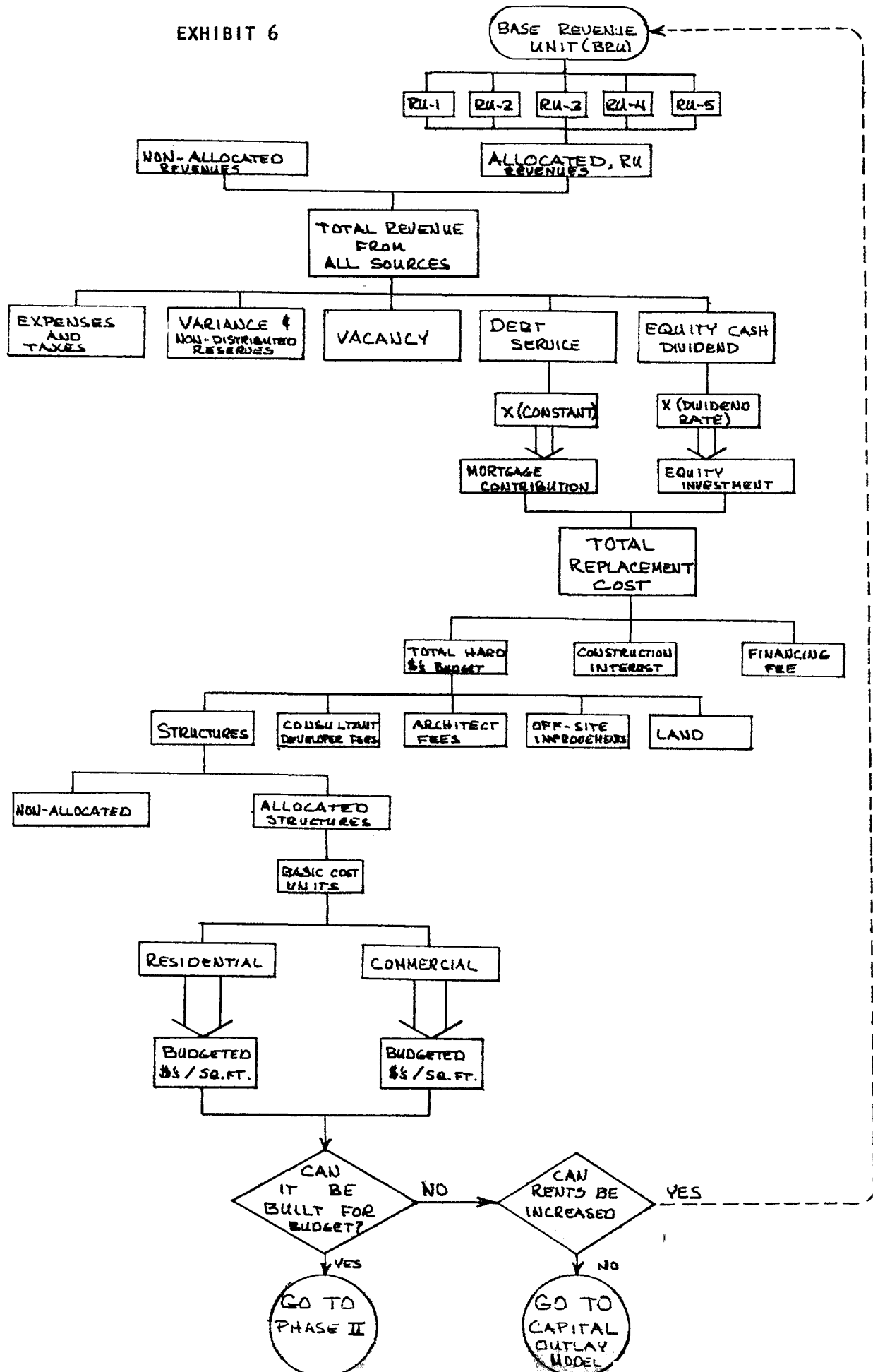
4.140 Merchandising data is generally primary information generated by the analyst about specific competitive projects and specific user groups which will permit an estimate of what percentage of the opportunity group can be captured for a specific project.

> 4.141 Absorption rates apply to aggregate market data to determine the total size or amount of market activity in terms of how many lots were sold, how many apartments in a rental range were newly rented, or how many sq. ft. of leased office space were occupied.

> 4.142 Capture rates are the product of merchandise research and are the ratio of the total opportunity potential which might be secured for a project or must be secured to achieve financial goals. The capture rate will reflect a careful judgment of product mix, amenities, pricing, and timing.

4.150 Unlike appraisals the feasibility analyst generally begins with a particular users group in mind and then relates this target to the larger economic scene. As Diagram #4 suggests, site analysis identifies one or more probable user types or client preference or intuition as focused on a rental range and therefore market segment he may wish to serve.

> 4.151 The relationships between the determinance the project attributes and market requirements as to product mix, amenities, and price are reversible procedures depending on whether we have a physical property in search of a user group or a user group for which a physical property is sought or is to be designed.

> 4.152 A more complex flow chart of the market research process is provided in Exhibit 6.

4.160 Before analyzing the relationship between the physical attributes of the site or project and merchandising requirements to reach the potential users of that site, some of the basic market research techniques appropriate to either case will be examined.

DIAGRAM #4

```
┌─────────────────┐              ┌─────────────────────┐
│    PROJECT      │◄─────────────│   PRODUCT MIX,      │
│   ATTRIBUTES    │              │  PRICE & CAPTURE    │
│                 │              │   RATES OF SUBJECT  │
└─────────────────┘              └─────────────────────┘
         │        \                         ▲
         ▼         \                        │
┌─────────────────┐ \            ┌─────────────────────┐
│   POTENTIAL     │  \──────────►│  COMPETITIVE EDGE    │
│     USES        │─────────────►│    OF SUBJECT        │
└─────────────────┘              └─────────────────────┘
         │                                  ▲
         ▼                                  │
┌─────────────────┐              ┌─────────────────────┐
│   POTENTIAL     │◄─────────────│  RATIO OF SEGMENT    │
│     USERS       │              │  WHO CAN AFFORD      │
│                 │              │     SUBJECT          │
└─────────────────┘              └─────────────────────┘
         │                                  ▲
         ▼                                  │
┌─────────────────┐              ┌─────────────────────┐
│ SIZE OF OPPORTUNITY│──────────►│  RATIO OF SEGMENT    │
│   USER GROUPS   │              │  INTERESTED IN       │
│                 │              │     SUBJECT          │
└─────────────────┘              └─────────────────────┘
```

EXHIBIT 6

BASE REVENUE
UNIT (BRU)

| RU-1 | RU-2 | RU-3 | RU-4 | RU-5 |

NON-ALLOCATED
REVENUES

ALLOCATED, RU
REVENUES

TOTAL REVENUE
FROM
ALL SOURCES

| EXPENSES AND TAXES | VARIANCE & NON-DISTRIBUTED RESERVES | VACANCY | DEBT SERVICE | EQUITY CASH DIVIDEND |

X (CONSTANT)

X (DIVIDEND RATE)

MORTGAGE
CONTRIBUTION

EQUITY
INVESTMENT

TOTAL
REPLACEMENT
COST

| TOTAL HARD $$ BUDGET | CONSTRUCTION INTEREST | FINANCING FEE |

| STRUCTURES | CONSULTANT DEVELOPER FEES | ARCHITECT FEES | OFF-SITE IMPROVEMENTS | LAND |

| NON-ALLOCATED | ALLOCATED STRUCTURES |

BASIC COST
UNITS

| RESIDENTIAL | COMMERCIAL |

| BUDGETED $$ / SQ.FT. | BUDGETED $$ / SQ.FT. |

CAN
IT BE
BUILT FOR
BUDGET?

NO →

CAN
RENTS BE
INCREASED

YES

↓ YES

GO TO
PHASE II

↓ NO

GO TO
CAPITAL
OUTLAY
MODEL

4.200　There are many model methods to edit and reduce aggregate data to focus on market questions relative to a particular property or consumer group. Before doing primary research on potential consumer groups, it is useful to structure the aggregate data in such a way that one can identify the critical ratios which permit the analyst to define a specific market segment and estimate the size of that market segment opportunity.

4.210　Establishing a retail trade area perimeter for a supermarket is a device which segregates households with a reasonable probability of using the outlet from those who don't because of convenience, distance, age, or income.

4.220　Consider Exhibit 7 as a simple market model to define the size of an opportunity area in a selected county for elderly persons requiring residential care units.

4.230　Consider Exhibit 8, an extended tabular model to project household growth and bank deposits for a branch bank in a planning district where population and building permit data is integrated with low-level air survey photography on a quarter-quarter section basis.

4.240　Consider Exhibit 9, a flow chart to diagram the relationships by which market data is eventually converted to gross revenue. This chart is placed near the beginning of the report to communicate where the analyst is going and how he proposes to get there. The answer is given and then the assumptions are documented like footnotes to an accounting statement. This approach is just the opposite of many studies which catalog data ad naseum and then arrive at a conclusion out of the wilderness, leaving no trail to follow.

4.250　Some types of projects may require several different aggregate data models because of various sub-markets for the property. An office building may appeal to lawyers, accountants, and perhaps political lobbyists and trade associations. The scale of each of those markets and the capture rate may be different. To construct a market demand base for a northern Wisconsin resort center, there were nine different aggregate demand models and capture rate models required:

　　　Summer Season:
　　　　(1)　Vacationers by the week
　　　　(2)　Summer travelers by the night
　　　　(3)　In-house summer seminars

　　　Off-Season: (Fall & Spring)
　　　　(4)　Business seminars
　　　　(5)　Weekend mini-vacations for fall color
　　　　(6)　Miscellaneous travelers

EXHIBT 7
DEMAND FOR ELDERLY RESIDENTIAL CARE UNITS

Persons in County age 65 and over in 1970		21,914
Adjustment 1970-1974 to reflect the number of persons moving into the 65+ bracket and the application of mortality rates by age and sex		245
Estimated persons in County age 65 and over in 1974		22,159
Less persons 65+ presently in nursing and residential care facilities in County	1,792	
Less persons 65+ presently in government subsidized housing for the elderly	638	
		2,430
Persons age 65+ in the conventional housing market in County in 1974		19,729
Estimated number of persons financially qualified for and seriously interested in moving into the proposed residential care development		4,270
Household equivalent (÷ 1.519 persons per household)		2,811
Less estimated number who will not convert serious interest into any form of action (50%)		1,406
Less the percentage who, while seriously interested, said (before they heard the hypothesis) that their next home would probably be outside County (13.3% from survey questionnaire)	187	
Less those disqualified because their current health status necessitates care beyond the scope of services to be provided in the residential care units (5.4% (from survey)	76	
		263
Elderly households in County qualified for and seriously interested in moving into the proposed development		1,142
Plus an allowance for those elderly households coming from outside County to enter the proposed development (10%)		127
Elderly households qualified for and seriously interested in moving into the proposed development		1,269

Share of market opportunity area who stated in survey
that for their next dwelling unit their first preference
would be an apartment, in a highrise, midrise, or garden
building:

Highrise or midrise	28.0%	
Garden	49.1	
	77.1%	978
Less estimated numbers of households who might move into competitive developments available supply of units		270
Households that can be considered candidates for the proposed development		708

That share of households who said they would be willing to move:

Within 1 year from now	15.6% - 110	households
Within 2 years	31.2% - 220	"
Within 5 years	53.4% - 378	"
	708	

A project of 100 units requires a capture rate of:

     91% for a 1 - year absorption rate
     90% for a 2 year   "   "
     14% for a 5 year   "   "

EXHIBIT 8

HOUSEHOLD GROWTH RATE - PRIMARY TRADE AREA 1970-1972
(Basis for household projection, 1974-1980)

Section	Quarter Section		Households 1970	Increase Households 1970-1972	Households 1972	Increase(%) Household 1970-1972	
23	3		13	0	13	0	
	4		44	0	45	0	
24	1	.25	16	3	19	9 *	
	2	.25	10	0	10	0	
	3		4	0	4	0	
	4		2	0	2	0	
25	1		130	50	180	19 *	
	2		134	8	142	3 *	
	3		36	12	48	17 *	
	4		323	104	427	16 *	(NG)
26	1		145	4	149	1 *	
	2		3	0	3	0	
	3		8	0	8	0	
	4		1	0	1	0	
27	1	.50	0	–	–	–	
	4	.67	125	52	177	21 *	
34	1		1	0	1	0	
	4		5	0	5	0	
35	1		28	0	28	0	
	2		8	0	8	0	
	3		0	0	0	0	
	4		25	0	25	0	
36	1		23	3	26	7 *	
	2		51	5	56	5 *	
	3		9	0	9	0	
	4		10	0	10	0	
19	1	.50	317	4	321	1 *	(NG)
	2	.50	240	10	250	2 *	(NG)
	3		529	7	536	1 *	(NG)
	4		511	1	512	0	(NG)
30	1		273	0	273	0	(NG)
	2		285	40	325	7 *	
	3		113	11	124	5 *	
	4		19	0	19	0	
31	1		20	0	20	0	
	2		142	19	161	7 *	
	3		10	0	10	0	
	4		7	0	7	0	
TOTALS			3620	334	3954	4.6%	
HGA ('70-'72) *			2609	334	2943	6.4% = G '70÷'72	
HNG '72 (NG)					2319		
HGA '72					1635		

HOUSEHOLD PROJECTION - CALCULATIONS
1974 - 1980

GIVEN: H   = Number of Households

HGA ('72)   = Total # Households in Growth Areas (*) 1972

HGA ('74)   = Total # Households in Growth Areas (*) 1974

HNG ('72)   = Total # Households No Growth Areas NG - 1972

HI ('72-'74) = Increase # Households (1972-1974)

HI ('74-'80) = Increase # Households (1974-1980)

G ('70-'72) = Annual Projected Increase (%) # Households

Na   = Number of Years/'72-'74 Projection Period = 2

Nb   = Number of Years/'74-'80 Projection Period = 6

THEN: H 1974 = HNG ('72) + HGA ('72) + HI ('72-'74)

WHERE: HI ('72-'74) = [HGA ('72)] [G ('70-'72)] Na

AND: H 1980 = HNG ('72) + HGA ('74) + HI ('74-'80)

WHERE: HI ('74-'80) = [HGA ('74)] [G('70-'72)] Nb

I. 1974 - HOUSEHOLD PROJECTIONS

A. Primary Trade Area (PTA)

Given: G ('70-'72)   =   6.4%
       HNG ('72)   = 2319
       HGA ('72)   = 1635
       HI (72-'74)   = [HGA ('72)] [G ('70-'72)] Na
                     = (1635)   (.064)   (2)
                     = 209

Therefore: PTA - H 1974 = HNG ('72) + HGA ('72) + HI ('72-74)
                        = 2319   + 1635   + 209
                        = 4163

B. Secondary Trade Area - A

Given: G ('70-'72)   =   4.8%
       HNG ('72)   = 590
       HGA ('72)   = 390
       HI ('72-'84) = [HGA ('72)] [G ('70-'72)] Na
                     = (390)   (.048)   (2)
                     = 37

Therefore: STA (A) - H 1974 = HNG ('72) + HGA ('72) + HI ('72-'74)
                            = 590   + 390   + 37
                            = 1017

C. Secondary Trade Area - B

Given: G ('70-'72)   =   2.5%
       HNG ('72)   = 2297
       HGA ('72)   = 535
       HI ('72-'74) = [HGA ('72)] [G ('70-'72)] Na
                     = (535)   (.025)   (2)
                     = 27

Therefore: STA (B) - H 1974 = HNG ('72) HGA ('72) + HI ('72-'74)
                            = 2296   535   + 27
                            = 2858

D. Secondary Trade Area - C

       G ('70-'72)   =   8.5%
       HNG ('72)   = 3574
       HGA ('72)   = 1326
       HI ('72-'74) = [HGA ('72)] [G ('70-'72)] Na
                     = (1326)   (.085)   (2)
                     = 225

Therefore: STA (C) - H 1974 = HNG ('72) + HGA ('72) + HI ('72-'74)
                            = 3574   + 1326   + 225
                            = 5125

II. **1980 - HOUSEHOLD PROJECTIONS**

    A. **Primary Trade Area (PTA)**

        Given: G ('70-'72) = 6.4%
                  HNG ('72) = 2319
                  HGA ('74) = 1844
                  HI ('74-'80) = [HGA ('74)] [G ('70-'72)] Nb
                             = (1844) (.064) (6)
                             = 708

        Therefore: PTA H 1980 = HNG ('72) + HGA ('74) + HI ('74-'80)
                             = 2319 + 1844 + 708
                             = __4871__

    B. **Secondary Trade Ares - A**

        Given: G ('70-'72) = .048
                  HNG ('70) = 590
                  HGA ('74) = 427
                  HI ('74-'80) = [HGA ('74)] [G ('70-'72)] Nb
                             = (427) (.048) (6)
                             = 123

        Therefore: STA (A) - H 1980 = HNG ('72) + HGA ('74) + HI ('74-'80)
                                 = 590 + 427 + 123
                                 = __1140__

    C. **Secondary Trade Area - B**

        Given: G ('70-'72) = 2.5%
                  HNG ('72) = 2296
                  HGA ('74) = 562
                  HI ('74-'80) = [HGA ('74)] [G ('70-'72)] Nb
                             = (562) (.025) (6)

        Therefore: STA (B) - H 1980 = HNG ('72) + HGA ('74) + HI ('74-'80)
                                 = 2296 + 562 + 84
                                 = __2942__

    D. **Secondary Trade Area (C)**

        Given: G ('70-'72) = .085
                  HNG ('72) = 3574
                  HGA ('74) = 1551
                  HI ('74-'80 = [HGA ('74)] [G ('70-'72)] Nb
                             = (1551) (.085) (6)
                             = 791

        Therefore: STA (C) - H 1980 = HNG ('72) + HGA ('74) + HI ('74-'80)
                                 = 3574 + 1551 + 791
                                 = __5916__

EXHIBIT 9

ILLUSTRATION No. 7

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.

FLOW DIAGRAM OF HISTORICAL SITE FEASIBILITY

- Number of Sunday Sightseers in County
- % of County within Thirty-Mile Radius
- Number of Sightseers
- Villa Louis Stonefield Old Wade House
- Ratio of Attendance to Sightseers
- Number of Visitors
- Admissions
- Children / Adults / Free
- Admission Price Per Visitor
- Gross Income
- Concessions
- Net Income Available for Return on Capital
- Interest Cost per Thousand
- **TOTAL CAPITAL JUSTIFIED BY REVENUE ESTIMATE**
- Personnel Costs
- Maintenance
- Supplies
- Other Costs
- Expenses
- Administrative Supplies

$$\text{Net Income Available for Return on Capital} \div \text{Interest Cost per Thousand} = \text{TOTAL CAPITAL JUSTIFIED BY REVENUE ESTIMATE}$$

Source: James A. Graaskamp. A Guide to Feasibility Analysis, (Society of Real Estate Appraisers, 1972), p.40.

Winter Season:
- (7) Weekend skiers on ski hill
- (8) Cross-country skiers
- (9) Snowmobilers
- (5) Mini-vacationers
- (4) Business meetings - Monday through Thursday

4.260   The analyst must learn to make the best use of secondary data wherever he can find it by creating his own models and these models must show the client the logical, systematic progression from aggregate data to edited information. True, many of the initial assumptions are common-sense and convenience but the error in those may not be significant as further reductions of data are made; those assumptions which are crucial become visibly apparent and become the target of more exacting research expense. Finally, those assumptions when shown to be relevant remind the client of data in his own record system which he had not realized would be relevant. The initial models become a device for further action with the client.

    4.261   Remember that the model should relate to the question, namely delineation of the general group of consumers and not a nose-counting census.

    4.262   Remember there is a difference between precision and accuracy and one can have no more accuracy than is implicit in the assumptions. Precision is simply doing the mathematics correctly.

4.300   The revenue unit concept of the capital outlay and market revenue worksheets was left as a general unit because merchandising research, as well as definition of revenue potential, requires careful definition of the revenue unit which leads to models for market segmentation.

    4.310   The first clue to market segmentation may be found in correctly understanding the essence of the business or activity to be housed.

        4.311   A restaurant may be to feed, to provide recreational entertainment, or to provide a background for social exchange for business, for pleasure, for publicity, etc.

        4.312   A motel may be for transients, resorts, or terminal traffic. In any event the objective is to sell a room night where there is an 80% gross margin and anything after that is justified by its contribution to room night sales or reduction of fixed costs.

4.320 The revenue unit may be related to the method of measuring profit of the project in question such as per acre, per camper pad, per event, per front foot of shoreline, per stool or table, etc. not to mention sq. ft., per bowling alley or per tennis court hour.

4.330 Sometimes the unit is identified by who really signs the check for a particular type of real estate.

4.331 The salesman or the management paying his travel costs
4.332 The doctor or the clinic
4.333 The district manager or the corporate real estate manager
4.334 The ticket buyer or the promoter
4.335 The bowling league, team business manager, travel agency tour guide

4.340 The market segment may be defined initially by the source for a prospective user list - people who share a common address, hobby, professional specialty or some other identifier.

4.341 A reverse directory or criss-cross telephone book
4.342 Building directories of comparables
4.343 Mailing lists of specialty publications
4.344 License number spotting
4.345 Guest registers
4.346 Charge account mailing addresses

4.400 The objective of these approaches, revenue unit, the decision maker, the prospect list source, is to segment the user market to a specific and relatively small group of potential customers who can be surveyed to generate original and relevant information about their space needs and motivations.

4.410 The objective of this research is to produce a definition of site, product, and amenity attributes for a project which provides some element of monopoly for the project owner. Average rents are never adequate to current costs so that a project must always strive for the top dollar. Free enterprise is the art of creating a monopoly, if only for a moment in the mind of the buyer.

4.411 Real estate is a series of micro-markets. A 24-unit building with one, two, three bedroom units has at least three sub-markets.

4.412 A 24-unit building is a $500,000 enterprise with a $75,000 gross sales potential from only 24 customers!

4.420   A survey of existing properties and alternatives
         available to a selected market segment defines only
         the competitive standard - namely the minimum product
         and price necessary to be in the market. Comparison
         shopping further identifies where there may be gaps
         in the supply of alternatives, a market opportunity
         gap, or where the oversupply is so significant as to
         portend the last competitive alternative before
         bankrupcy - namely price cutting.

4.430   A survey of users, is designed to reveal or to identify
         the competitive differential attributes which would
         provide that monopoly element required of every
         successful project. A second product of consumer
         survey is the ability to develop locally relevant
         ratios which permit disaggregation of market data
         into market segments and the conversion of potential
         numbers of people into potential dollar sales over
         time.

4.500 To construct a useful and efficient consumer survey it is
       first necessary to have a basic model of the relationships
       you are trying to prove and a careful definition of the
       market segment you are attempting to define. In short,
       you begin with a mock-up of the final report logic, the
       model which converts data to rents (to test previous
       worksheet).

4.510   Consider the elderly housing market chart in Exhibit 7.
         Notice that the ratios required for market segmentation
         follow a logical reduction pattern. The analyst has
         made several working assumptions - namely that his
         market is over 65 and overwhelmingly from Dane County
         because these assumptions are both reasonable and
         conform to break-out points in the raw data.

4.520   The ratio sought by the survey follow a precise
         reduction pattern:

         4.521   How many will consider moving?
         4.522   Of those, how many would consider staying in town?
         4.523   Of those, how many would consider an apartment?
         4.524   Of those remaining who would consider an
                 apartment in town, how many would consider
                 a specific location?
         4.525   Notice the reduction process defines a subset
                 of the elderly market - a micro-market.

4.530   Each of these ratios suggests a specific calculation
         or perhaps a short table of statistics. The specific
         title on the table of data and its sub-columns should
         be written before the questions are drafted and the
         collection of data begun. Notice the research begins
         with careful definition of the questions to be answered.
         All answers become relevant and all unneccessary
         questions are avoided. These type of questions

depend on knowing the precise character of secondary data available to which the ratios must be applied in the systematic model devised for the problem.

4.540 The second type of question is generally attempting to measure either anxieties or preferences. Both are dangerous survey areas for amateurs as well as professionals and it is often cheaper to subcontract these particular functions to consumer research specialists. Nevertheless, a little common sense can generate considerable useful information on the competitive edge.

4.541 Probe for dissatisfaction with existing space or life style.
4.542 Probe for anxieties about uncontrollable trends and events.
4.543 Probe for desired social structure ties, real or imagined.

4.550 The real estate analyst can choose between systematic telephone interviews, direct mail questionnaires, and personal interviews in depth. These represent increasing costs to gain reliability and scope, particularly on visual concepts, at the expense of increasing time required for completion. The results of the surveys can:

4.551 Provide much input to pre-architectural programs ranging type of unit to floor and wall textures preferred.
4.552 Serve as a device for political participation in the neighborhood impacted by the proposed development.
4.553 Generate pre-sale prospect lists.
4.554 Redefine true nature of market and its motivation and the revenue unit to provide a base for analysis.

4.600 As a simple illustration of the relationship of consumer need to pre-architectural programs, consider the survey approach for a turnkey, 160-unit elderly housing project, solicited by the City of Madison Housing and Redevelopment Authority for a specific urban renewal site. Developers were to compete on both cost and sensitivity of design with an oral presentation to the Board in addition to submission of bid materials.

4.610 The packet of bid instructions included:

4.611 Identification of the 116,549 sq. ft. site (with views of lake, park, and hospital)
4.612 Restriction of access to one side of site, and inclusion of 53 parking stalls, and a drive through portachere

4.613 A statement that the proposed structure
be in harmony with existing buildings.

4.614 Limit of 160 units in three distinct structures
inter-connected by an enclosed weatherized
corridor system for elderly housing.

4.615 Specification of three structures consist
of a one-story building housing 10-15%
of total units; a three-story with 25-35%
of total units; and a high rise with the
remaining 60-70% of the total units.

4.616 Provision of extensive community, recreation,
management and maintenance spaces with explicit
instructions as to the location and relation-
ship of the latter two space groups.

4.617 Design in accord with HUD Minimum Property
Standards.

4.618 Time between solicitation and presentation
was four weeks.

4.620 Joint venture proposal was to include experienced
design/construction firm from out-of-town, the local
broker/developer for financing and community relations,
and a team of two graduate students in real estate.
After organization of their joint venture three and
one half weeks remained; designer required two weeks
to prepare materials; estimator two days, etc. and
specification and development of a pre-architectural
program had to be completed in eight days.

4.621 Four days allocated to data collection and
survey design; four days allocated to analysis
and development of design program.

4.622 Market researchers read relevant secondary
literature (such as Housing the Elderly,
Central Mortgage and Housing Corporation of
Canada, Second Edition, July 1972, Printed
in Canada; or Design of Housing for the Elderly:
A checklist, by Marie C. McGuire, NAHRO 1972;
items found in The Built Environment For the
Elderly and the Handicapped, a bibliography,
U. D. Department of Housing & Urban Development,
Library and Information Division, June 1971).

4.623 Researchers visited several Madison projects,
obtained floor plans, and visited with managers
to make a subjective analysis of the relative
success or misfit design elements in existing
housing.

4.630 During same two day period architect/engineers
reviewed information packet and site constraints;
then met with market researchers to generate the
following basic research questions.

4.631 What are the physical limitations of the prospective residents requiring special features?

4.632 What is the prior living experience of the resident, to minimize disruption of life style through design sensitivity?

4.633 What unit mix would be appropriate?

4.634 How is unit mix allocated between three required structures?

4.635 What should be basic unit size?

4.636 How should space within each unit be allocated?

4.637 What functions and design features should be included in community spaces?

4.638 Are there other wants, needs and anxieties of users unmet by existing Madison elderly housing projects?

4.640 To answer these questions the survey design required specification of survey measurement devices and identification of a respondent group.

4.641 Given the experience of the researchers, their preliminary research to brief themselves, and a two-day time limit, they chose to do a non-probability judgment sample.

4.642 Time schedule required a telephone survey technique with a random sample of residents in elderly housing units in Madison.

4.650 Sampling criteria required:

4.651 Sample be representative of the population of interest

4.652 Persons selected must be able to respond with relevance and validity to the survey

4.653 Population from which sample would be drawn had to be experienced in type of unit to be researched

4.660 In response to these criteria:

4.661 It was reasoned that most likely there would be homogeneity of demand characteristics between present occupants of public elderly housing in Madison and prospective occupants on Housing Authority waiting lists.

4.662 Literature search indicated that continuity theory (habit, pattern, life style) control elderly so that occupant of present comparable units would best be able to relate to design questions and project their future needs and desires relative to their own units and experience.

4.663 A need survey could have been made of Housing Authority management, building managers, or HUD underwriters but developer felt that the best responding group would be the elderly themselves.

4.670 The interview sampling plan consisted of:

4.671 Identification of Madison public housing units for the elderly by street address

4.672 Identification of present occupants by name in existing units from current reverse telephone directory.

4.673 Random sample of residents named and available by phone (potential bias)

4.680 Survey results were to be keypunched and analyzed on a cross tabulation program at the UW School of Business Computer Center to reveal how different persons in different types of units might have differed in their responses.

4.681 For speed, keypunching was to be done directly from completed questionnaire form

4.682 Usable forms were required to have answers to all relevant questions

4.683 Ultimately there were 99 usable responses from a total population of 268 apartment units in the Madison elderly housing program.

4.684 Two persons completed these responses in two twelve hour working days; computer analysis took one day.

4.690 Sample questionnaire provided in Exhibit 10

4.691 Telephone survey very poor technique for measuring attitudes of elderly

4.692 More valid than group meetings conducted by Housing Authority where residents are intimidated by landlord, size of group, or dominant extroverts

4.693 Personal interview more time consuming and more valuable

4.694 Interviews should be conducted in respondent own unit to position questions against current experience and to permit demonstration with more ease than verbal articulation.

4.695 Exhibit 10 should be viewed as demonstrating how standardization is imposed on telephone survey techniques

4.696 Interviewers were women

4.700 The questionnaire was intended to generate a brief consumer profile, identify possible significant and subtle dissatisfactions with unit design, and permit some open-end questions to explore areas not anticipated by researchers.

4.710 The consumer profile of the typical occupant:

4.711 Was female (83%)

4.712 Had previously rented a housing unit (82%) with 91% having paid less than $175 per month and 60% had paid less than $100, indicating most found the public housing unit better in quality and lower in price ($50-$60 per month)

4.713 Long waiting periods before admittance to public housing generally made them most grateful and non-critical.

4.714 Almost all had known low density low rise residential environments over their lifetimes.

4.720 For space allocation and features the survey revealed:

4.721 Satisfaction of present site with living room larger than bedroom, etc.

4.722 99% preferred bathroom to open into bedroom

4.723 Open-end question revealed majority wanted outside window from kitchen

4.724 Desire for indoor walking-exercise area without steps

4.725 Desire for lounges tied to indoor passages and with views of action centers

4.726 Desire for outside space defended from intrusion by strangers, kids, etc.

4.727 Desire for community craft and recreation facilities which were not isolated by stairs, windowless walls, or outside walkways (as was the case in Madison projects).

4.728 Anxiety about high rise among many due to fire hazard dependence on elevators or lifetime unfamiliarity with high rises.

4.729 Preferred more units per floor in low rise to exclusiveness of high rise floor but would take anything they could get.

4.730 The theory on aging elderly behavior patterns also contributed to design constraints, for example, the disengagement theory indicates the elderly gradually lose the energy to maintain a great variety of social contacts, etc., a tendency which leads to isolation and increased depression due to lonliness.

4.731 Physical design must provide a variety of choices as to their withdrawal from the street, the total project, a small group of neighbors, or their own room.

4.732   At the same time heterogeneity of unit mix avoids clustering all handicapped, all married, etc. in one particular zone to give everyone a variety of social contacts.

4.733   Circulation patterns can be designed to encourage random meetings without forcing social involvement.

4.734   Visual elements which are depressants such as views of cemeteries, hospitals, nursing homes, etc. should be avoided.

4.740   With the initial design constraint inputs, the designers worked up a tentative plan which proved to exceed the desired cost estimate at which point estimators, market analysts, and designers met in an all-day session to hammer out final trade-offs. A 165-unit project was the result as described in Exhibits 11, 12, 13 and 14.

4.741   Project had second lowest total cost ($3,397,380 or $26,000 per unit) of the ten proposals submitted.

4.742   Project was turned down by renewal board because they did not like contractors reputation for economy and thought the exterior was less attractive than conventional tower.

4.743   Experience is typical of real estate that is designed to please the investor rather than the ultimate user, particularly when the investor has not properly defined the context in sufficient detail to judge the fit of any proposal submitted.

TABLE

UNIT CHARACTERISTICS AND DISTRIBUTION

BUILDING	UNIT TYPE	DESCRIPTION	NUMBER	FLOOR	NET SQUARE FOOTAGE	TYPICAL VIEW
One-Story	A	Handicapped 1 Bed	8	1	505	(4) Courtyard (4) Brittingham Park
	B	Handicapped 2 Beds	8	1	524	(2) Courtyard (2) Neighborhood Terrace (4) Brittingham Park
Mid-Rise	C	Handicapped 1 Bed	12	1	504	(7) Brittingham Park West (5) Courtyard
	C	1 Bed	18	2,3	504	(6) Brittingham Park West (12) Brittingham Park East
	D	2 Beds	8	2,3	536	(8) Brittingham Park West
	E	1 Bed	2	2,3	504	(2) Brittingham Park East
High Rise	C	1 Bed	84	2-8	504	(42) Capitol (42) Lake Monona
	D	2 Beds	24	9,10	536	(12) Capitol (12) Lake Monona
Manager's Apartment	F	2 Bedroom	1	1	660	Courtyard

EXHIBIT 11
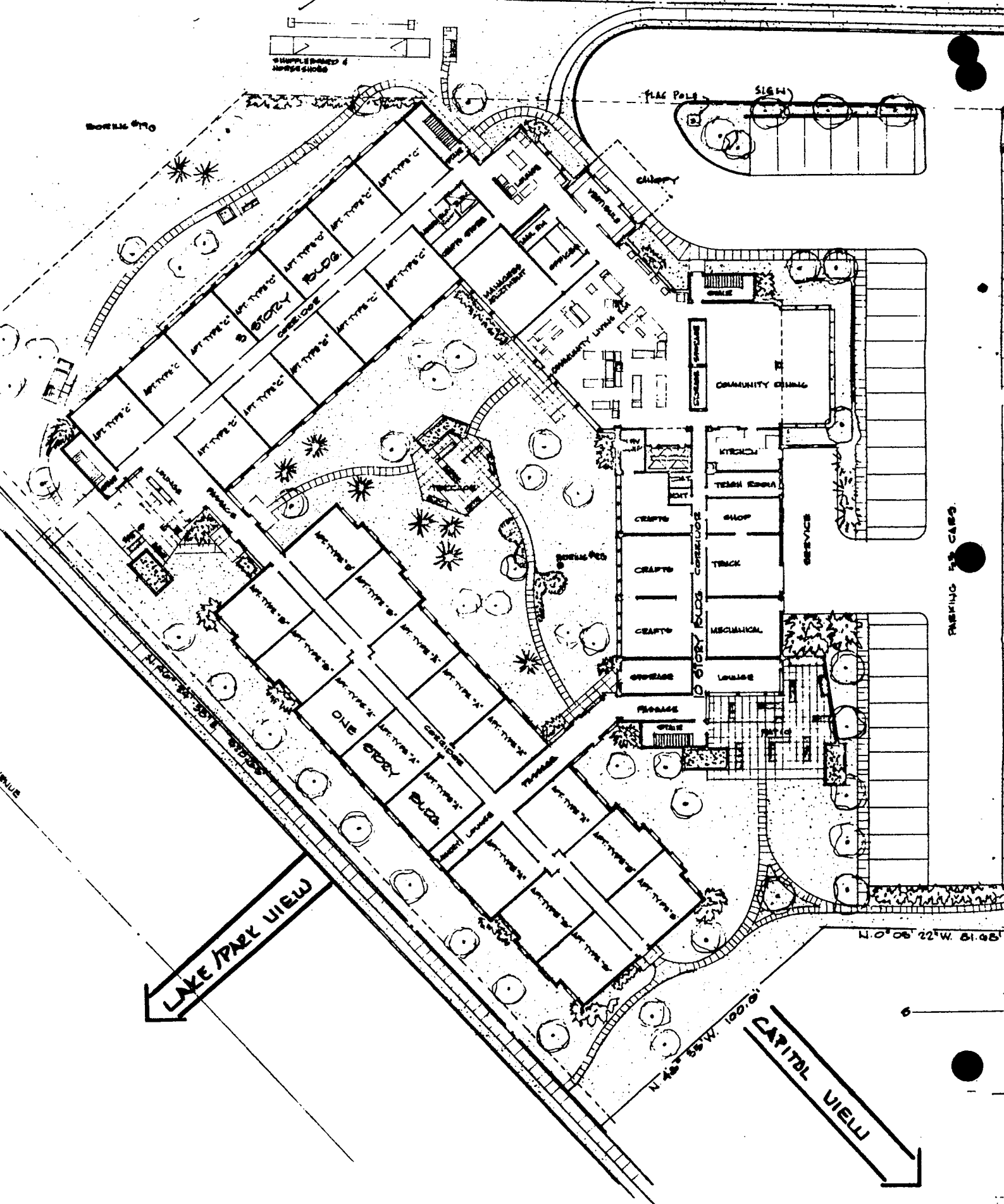
EXHIBIT 12

EXHIBIT 13
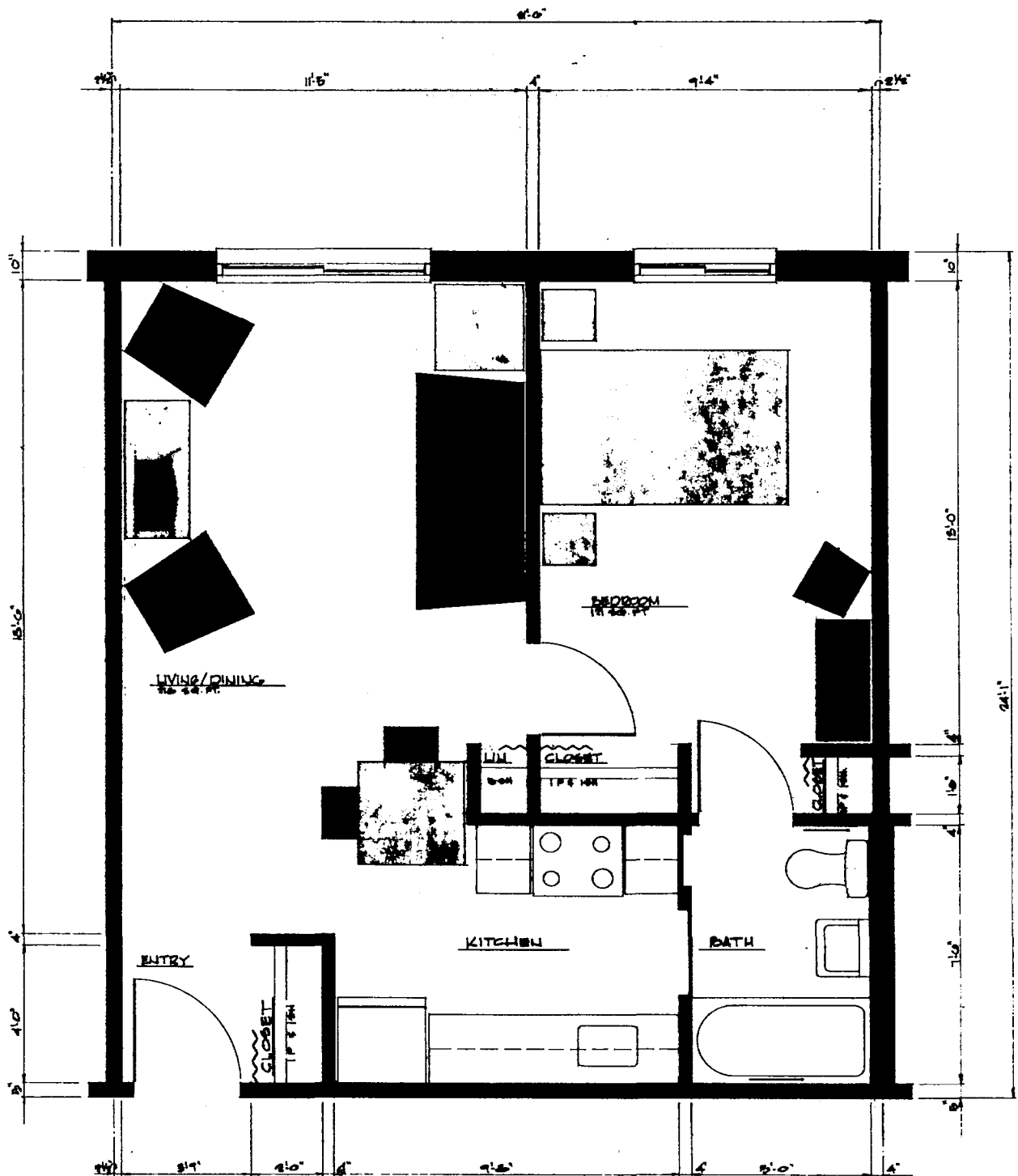
622 sq ft. GROSS · 505 sq ft. NET

ONE STORY BLDG · ONE BEDROOM APT. TYPE "A" · 8 UNITS.
SCALE 1/2" = 1'·0'

KITCHEN SHELF AREA 53 SQ FT.
KITCHEN DRAWERS 8 SQ. FT.
GENERAL STORAGE 179 CU. FT.

EXHIBIT 14
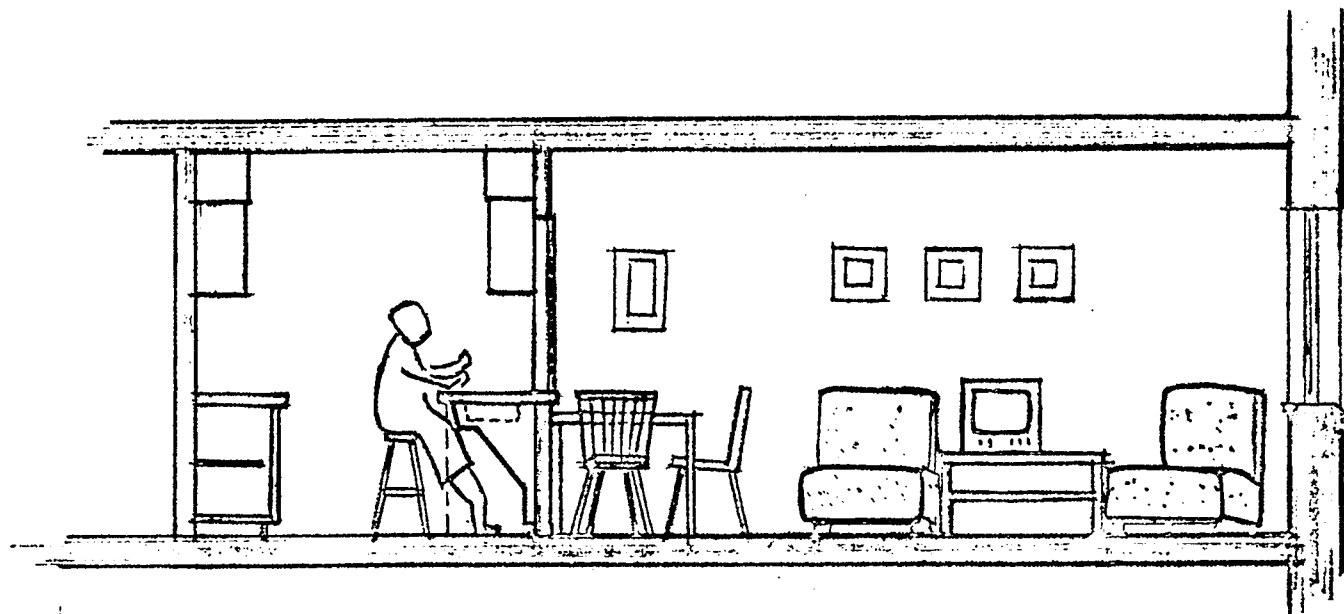
ELEVATION — KITCHEN & LIVING ROOM TYPES C & D

SCALE 1/4" = 1'-0"   TOTAL 146 UNITS

5.000 Non-Market Constraints on Project Feasibility

Assuming effective demand and capital cost numbers can be brought into balance for specific package of improvement, there remain several key questions of fit, any one of which can derail a project. In order of importance are site suitabilities, impact compatibility on the community, and the legal-political environment within which the project must work. In a survey of feasibility issues these can be treated only in a introductory fashion.

5.100 Site analysis begins with a specific site and structures or stems from the market revenue approach as a set of site specifications which will control the search for alternatives. There is no such thing today as raw land or a vacant lot. A site suitability study recognizes every site has:

5.110 Static attributes - physical characteristics of size, shape, topography, soils, etc.

5.120 Linkage attributes - relationships to other sites which may tend to generate movements of goods and people to the subject site.

5.130 Dynamic attributes - characteristics which affect behavior such as visibility, prestige, or feeling of fear or anxiety.

5.200 Static attributes analyzed should include the facts and the implications of the following:

5.210 Size, shape, and area

5.220 Topography, soils, slope stability, and water table

5.230 Legal uses

5.240 All set-back lines and building envelopes

5.250 Access controls (proximity is not accessibility)

5.260 Concealed utility easements, old foundations, etc.

5.270 Flood plains which have been determined by Corp of Engineers, etc.

5.280 Scarce environmental elements which almost certainly mean environmental impact litigation

5.290 Landmarks or historical structures

5.300 Site map and analysis should not only document the existing controls but attempt to anticipate external controls on use which may be introduced by administrative process:

5.310 Water district, harbor commission, or other special district lines

5.320 Premises of community master plans still in incubation process

5.330 Tax conservancy commitments

5.340 Extra territorial zoning or subdivision powers

5.350 Attitudes of sewer, water, and highway commissions

5.360 Contractual agreements among previous buyers and sellers which may or may not run with the land

5.370 Planner views of physical barriers to restrict "sprawl"

5.380 Existing or impending legislation should be anticipated relative to:

   5.381 Septic tank installation
   5.382 Ground water, depth and conservation of high water recharge areas
   5.383 Salt water encroachment
   5.384 Conservation of environmental edges
   5.385 Conservation of prime agricultural land
   5.386 Water quality standards
   5.387 Air quality standards

5.390 Analysis of the static site attributes should also be in terms of competitive advantages and disadvantages of each attribute in terms of pricing and marketing.

   5.391 Some attributes lead to higher cost which the front door approach may reveal as leading to excessive rents or prices.

   5.392 Some static attributes can provide monopoly advantages because its suitability is unique relative to lands all around it, because of exemption from certain regulations, or existing approvals of development plans, including licenses for dredging, building code variances, etc.

   5.393 Static attributes will also help identify "best use" or the most probable buyer.

   5.394 Lack of fit between static site and merchandising data is a basic cause of unsuccessful projects.

5.400 Linkage attributes have to do with functional relationships or points of interaction with activity centers which may generate users or provide the infrastructure of improvements which support the site.

   5.410 Streets, sidewalks, rail, and transit systems serving the site.

5.420 Access points

    5.421 Traffic department controls, present and proposed
    5.422 Rail switching and truck tariff zones
    5.423 Indirect controls imposed by factors affecting behavior (see dynamic attributes, 5.000)

5.430 Utility services are linkages, too.

    5.431 Sewer and storm water capacities
    5.432 Water, gas, and electric hook-ups, availability and capacity
    5.433 Community energy supplies and sources
    5.434 Implicit resources such as stock of wild game, labor pools, alternatives to the auto, etc.

5.440 Capacity of existing transportation systems to absorb unit volume generated on site and implications for off-site improvement budgets.

5.450 Relationship of subject site to generators of potential needs and uses for the subject site.

    5.451 Employment centers
    5.452 School system alternatives
    5.453 Neighborhood demographic characteristics, etc.
    5.454 Complimentary existing nearby uses
    5.455 Recreational services
    5.456 Health care systems
    5.457 Security systems
    5.458 Waste disposal services

5.460 Relationship to competitive alternatives and exposure to interception of linkages.

5.500 Dynamic attributes have to do with the mental or emotional responses which it stimulates as it affects decision making behavior. These decision makers may be property buyers, regulators of site use, or customers of establishments located on the site.

5.510 Image conditioning of the approach zone

5.520 Visual factors in terms of prominence of the site, views from the site, potential for controlled sight lines, etc.

5.530 Anxiety factors of access and security

5.540 Noise as a function of traffic count (FHA noise pollution manual).

5.550 Prevailing air currents and airborne pollution (phosphate plants or sulphite paper mills, for example).

5.560 Political images established for a site by the public
positions of local politicians or vested interest
groups.

5.570 Historical community reputation and values attached
to the project site and structures.

5.570A Recycling of old buildings within existing
urban areas is fashionable among architects
and the upper class.

5.570B Recycling may establish historical roots
and images.

5.600 These various groups of attributes bear different weights
in the process of feasibility analysis depending on what
questions remain to be answered. At one point or another
the analyst will be arriving at some conclusions as to the
potential misfits between the site and:

5.610 What attributes are essential for the intended use?

5.620 What attributes negative to the intended use can
be neutralized and at what cost?

5.630 Are there competitive sites with superior attributes
or does the site possess monopoly characteristics
for the use intended?

5.640 Who essentially needs the site?

5.650 Can these potential users afford the site?

5.660 How many of these users with effective demand
potential are there (relative to the capacity of
the site)?

5.700 The real estate product today must respond not only to
the needs of the individual consumer in the marketplace
but to the collective community of consumers which represent
the community political environment. The landscape builds
like a reef, the cumulative bones of thousands of individual
decisions. This decade will witness a final transition
from relative laissez faire attitudes of land as a commodity
to highly democratic regualtion of land as a public resource
and land use as a privilege granted by the public. If
the proposal won't sell at City Hall there will be no
opportunity to market the product to individuals. Therefore
the project must consider in its feasibility procedures
and in constraints imposed by pre-architectural programs
the impact on the environment of?

5.710 Physical factors of the environment

5.711 Soil stability and water tables beyond the
site boundaries

5.712 Eutrophication of lakes and streams
5.713 Disruption of environmental edges, plant, and wildlife areas
5.714 Impact on energy resources
5.715 Contribution to social disintegration
5.716 Aesthetic and urban design

5.720 Social factors of the environment

5.721 Displacement of existing residents and neighborhood units
5.722 Contribution to social integration or mobility barriers
5.723 Contribution to land use heterogeneity
5.724 Contribution to regional and community master plans

5.730 Economic factors of the environment

5.731 Direct impact on real estate tax revenues
5.732 Direct impact on other governmental revenue
5.733 Direct impact on incremental government
5.734 Secondary contributions to local government revenues
5.735 Secondary cost burdens created for local communities

5.740 Real estate business ethic environment

5.741 Impact on supply equilibrium
5.742 Impact on associated contractors
5.743 Impact on families of project sponsor
5.744 Ligitimacy of financing structure

5.750 Silhouette of proposed project in terms of public perception of impact.

5.760 Relationship of impact assessment to:

5.761 Scale of project
5.762 Vulnerability of project sponsor to secondary consequences of political discretion
5.763 Stamina of project sponsor in the face of public pressure

6.000 Structuring the Feasibility Report

Ultimately the budget established for analysis and the need to communicate the findings represent a severe constraint on the feasibility process. Priorities and critical assumptions necessary to achieve the desired outcome must be separated from the great mass of detail and presented tersely.

6.100 Format of the report should rely on three elements:

6.110 An executive summary which tersely identifies alternative courses of action and recommendations as to how client can make the choice.

6.120 A basic reference document which includes all the detail analysis.

6.130 A collection of reports by contributing professionals incorporated by reference.

6.200 To be terse the executive summary should depend on:

6.210 Simple charts of choices of alternative outcomes

6.220 Simple flow charts

6.230 Specific criteria used to measure "liklihood of success"

6.240 Incorporation by reference of statement of limiting conditions

6.300 Statement of limiting conditions should emphasize who:

6.310 Defined the constraints

6.320 Defined success

6.330 Provided the data and assumptions

6.340 Permitted key assumptions to remain untested for economy or speed

6.350 Accepted assumptions of conditions of uncertainty

6.360 Assembled proforma financial statements and projections