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20TH ANNIVERSARY CELEBRATION

CENTER FOR REAL ESTATE AND
URBAN LAND ECONOMIC STUDIES

UNIVERSITY OF CONNECTICUT
SCHOOL OF BUSINESS ADMINISTRATION

October 25, 1985

Howard Johnson's Conference Center
Windsor Locks, Connecticut

A MARKET COMPARISON PRICING ALGORITHM
BASED ON SET THEORY
(OR BILL SCHENKEL WAS RIGHT ALL ALONG)

- I. The appraisal process is a specialty in the information game, specifically the search for patterns in a glut of data points with plausible relevance to any given decision.
 - A. The metaphysics of information processing for decisions, especially appraisal decisions, should include at least four essential readings:
 1. Grammatical Man: Information, Entropy, Language, and Life by Jeremy Campbell, a Touchstone Book, Simon & Schuster, Inc., New York, 1982.
 2. The Complete Problem Solver by John R. Hayes, The Franklin Institute Press, Distributed by Charles Scribner's Sons, Philadelphia, PA, 1981.
 3. "Bounded Rationality" (See Exhibit 1 for summary statement of sources on this amended concept of prudent man.)
 4. Schenkel
 - B. Gene Dilmore has stated that the appraiser must choose his comparable data subjectively, but then treat it in an objective manner. Schenkel would argue that using Set Theory forces the appraiser to have explicit rules for the selection of comparables, and Dilmore would add that Set Theory allows us to sidestep the degrees of freedom required for inference about a larger universe by presuming the set to be the universe.
 - C. Dilmore has described the three approaches to value as Order, Chance, and Beauty
 1. ORDER assumes under everything is a universe in which the parts fit, information has a shape. Remember the test for color blindness, random dots in random colors until suddenly you see the red dots only as a letter or a number. As appraisers, we look for the red dots. Alternatively, appraisers are like the sculptor who chisels away that part of the rock that is not part of the figurine which is to remain.
 2. CHANCE acknowledges the possibility of alternative outcomes in our little closed system. Imprecision is inherent to behavioral science. No respectable scientist is afraid of the words "variance" or "error". We know in part

and see but through a glass darkly. We may be able to predict without always understanding cause and effect because of unknown cross-correlations.

3. BEAUTY can be a legitimate basis for constructing a hypothesis--elegance is the ultimate intuitive choice, judgment, or gut response. Models may be elegant and not fully understood but useful and sometimes dangerous like Ellwood, regression and cost. Remember Einstein created $E=MC^2$ using the speed of light for elegance 20 years before there was empirical justification.
- D. A less poetic hierarchy for appraisal methodology using contemporary tools is provided by Ratcliff who rated techniques by their power to predict behavior to a most probable price forecast:
1. MARKET COMPARISON INFERENCE from past transactions of buyers of similar motivation purchasing properties with similar productivity to the subject property in order to find, inductively, the most probable price within a transaction zone acceptable to both buyers and sellers.
 2. SIMULATION OF BUYER CALCULUS based on interviews of successful buyers in the marketplace with skills and past behavior necessary to implement the most probable use for the subject property, but this method was to be used in the absence of comparable sales to define the transaction zone of the buyer or as a check on values determined from market inference.
 3. NORMATIVE METHODS representing deductive logical systems as to what the buyers/sellers might do if they thought like an appraiser are the last hope where the appraiser can find no pattern in sales or simulation.
- II. One elegant system for inference from actual market transactions have evolved from the Ratcliff/Graaskamp weighted point process modified by Dilmore with an algorithm computed from non-parametric lattice statistics.
- A. The Dilmore RATGRAM algorithm for pricing first tests a pricing formula for each selected comparable and then presumes the same algorithm can be applied to the subject property. The procedure requires:
1. Adjusting prices for terms of sale and time on comparable properties. Comparable properties

would be those bought for renovation, or for the owner's own use, etc. You may choose to abstract out land values where size or locational quality is significantly different.

2. Selecting a proper unit of comparison.
 3. Developing a hierarchy of significant attributes thought to affect price and scoring each property on a point system.
 4. Developing a weighting system to rank the relative importance ordinal attribute scores on a cardinal scale.
 5. Developing a price per weighted point per unit of comparison.
 6. Testing the price weighting formula for best estimate of the sales price of actual comparables in order to minimize dispersion and variance between actual price and price estimated by formula.
 7. Applying a price per point per unit formula to the subject property to estimate range of alternative prices.
 8. Adjusting of predicted price for unique externalities such as land, financing, or non-transferable license.
- B. Search for appropriate unit of comparison as a single variable in a linear regression by trying three or four unit concepts, such as: (See Exhibit 2.)
1. Gross building area
 2. Net leasable area
 3. Cubage
 4. Two times the first floor area plus gross building area
 5. Barrels of cranberries rather than acres of cranberries
 6. Number of bedrooms rather than square feet.
- C. Arrive at a price per unit as the first step in establishing a price algorithm.

D. Identify property attributes which distinguish subject properties qualitatively from one another and develop a simple scoring system.

1. 5-3-1 is one method, but scores may become multipliers and lead to distortion.
2. Dilmore prefers:

<u>Rating</u>	<u>Points</u>
Excellent	26
Good	20
Average	15
Fair	13
Poor	10

E. See selection of examples in Exhibits 3 through 14.

F. The algorithm process offers several pluses while avoiding protocol problems with regression.

1. The price algorithm is first justified by the degree of explanation it provides on specific comparable property prices.
2. It can be replicated manually or with the aid of the mini-computer by juries, clients, or for the next similar subject property.
3. It sidesteps the needs for large numbers of sales transactions and fits the theory of bounded rationality which is the modern interpretation of prudent man.
4. It avoids the problem of appraisal protocol encountered by regression when the subject property is compared to a hypothetical set of means from a large number of observations with which the appraiser may not be familiar. Regression does not allow the appraiser to set his own adjustments on attributes nor identify and rank specific comps to the subject property.
5. The RATGRAM-DILMORE algorithm is pragmatic and yet compatible with the development of in-house appraisal data bank or other techniques which admit of uncertainty such as fuzzy sets or of conflict such as game theory models.

EXHIBIT 2

CORRELATION COEFFICIENTS AND R^2 OF SALES PRICE

Space Unit	Correlation	R^2
First floor frontage (frrt)	0.745	55.5%
Lot area	0.908	82.4
First floor (1st fl)	0.790	62.4
First floor + Upper floors (upp fl)	0.933	87.0
1st fl + .05 (upp fl)	0.919	84.5
2(1st fl) + upp fl	0.919	84.5
(1st fl) x (frrt)	0.784	61.5
[1st fl + 0.5 (upp fl)] x (frrt)	0.864	74.6
[2(1st fl) + upp fl] x (frrt)	0.864	74.6
(1st fl + upp fl) x (frrt)	0.874	76.4

EXHIBIT 3

RATGRAM STYLE

WOOLWORTH BUILDING
SCALE FOR SCORING COMPARABLES ON
IMPORTANT INVESTOR CONSIDERATIONS FOR
OFFICE - RETAIL SPACE IN MADISON
C-4 ZONING

LOCATION
10%

- 5 = High visibility
- 3 = Corner visibility limited
- 1 = Inside lot

EXPANSION POTENTIAL
30%

- 5 = Potential for significant increases of floor space
- 3 = Flexible layouts due to bay spacing and elevator position
- 1 = Inflexibility of layout due to old bearing walls and elevator shafts

CONDITION AT
TIME OF PURCHASE
25%

- 5 = Fully renovated and leased
- 3 = Long-term retail leases in place. Serviceable as retail in tired space.
- 1 = Vacant and in need of total rehabilitation. Short-term lease or large vacancy in need of total rehabilitation.

ELEVATORS AT
TIME OF PURCHASE
20%

- 5 = Two passenger and freight
- 3 = Two passenger
- 1 = One passenger

FENESTRATION ON UPPER LEVEL
15%

- 5 = Large windows facing the Square
- 3 = Limited window area
- 1 = No windows

WOOLWORTH BUILDING
WEIGHTED MATRIX FOR COMPARABLE PROPERTIES
SCORE/WEIGHTED SCORE

ATTRIBUTE	WEIGHT	COMPARABLE NO. 1 30 N. CARROLL WOLFF KUBLY	COMPARABLE NO. 2 14 W. HIFFLIN	COMPARABLE NO. 3 5 & 7 E. HIFFLIN CENTRE SEVEN	COMPARABLE NO. 4 50 E. HIFFLIN EMPORIUM	COMPARABLE NO. 5 2 W. HIFFLIN WOOLWORTH	SUBJECT
LOCATION	10%	3/0.30	1/0.10	1/0.10	3/0.30	5/0.50	5/0.50
EXPANSION POTENTIAL AT TIME OF SALE	30%	3/0.90	1/0.30	1/0.30	5/1.50	3/0.90	3/0.90
CONDITION AT TIME OF SALE	25%	1/0.25	5/1.25	1/0.25	3/0.75	3/0.75	1/0.25
ELEVATORS IN PLACE	20%	5/1.00	3/0.60	1/0.20	3/0.60	1/0.20	1/0.20
FENESTRATION ON UPPER FLOORS	15%	1/0.15	5/0.75	5/0.75	1/0.15	3/0.45	3/0.45
TOTAL WEIGHTED SCORE	100%	2.60	3.00	1.60	3.30	2.80	2.30
ADJUSTED SELLING PRICE (1)		\$625,000	\$750,000	\$240,000	\$850,000	\$662,500	
DATE OF SALE		7/17/80	2/27/84	12/31/77	4/30/78	7/31/78	
GROSS BUILDING AREA (GBA)		41,000 SF	40,000 SF	26,000 SF	42,500 SF	39,000 SF	39,000 SF
ADJUSTED PRICE/GBA		\$15.24	\$18.75	\$ 9.23	\$20.00	\$16.99	
ADJUSTED PRICE/GBA/ WEIGHTED POINT SCORE		\$5.86	\$6.25	\$5.77	\$6.06	\$6.08	

RATGRAM STYLE

EXHIBIT 4

(1) See Appendix _ for assumptions and calculations to determine adjusted selling price.

EXHIBIT 5
WOOLWORTH - RATGRAM STYLE
1st RUN

Attributes = 5

Attribute Names, Prelim. Weights

LOCATION 20
EXPANSION POTENTIAL 20
CONDITION AT TIME OF SALE 20
ELEVATORS IN PLACE 20
FENESTRATION ON UPPER FLOORS 20

of Observations = 5

Observ. # 1 WOLFF-KUELY-30 N. CARROLL Price 15.24

LOCATION 3
EXPANSION POTENTIAL 3
CONDITION AT TIME OF SALE 1
ELEVATORS IN PLACE 5
FENESTRATION ON UPPER FLOORS 1

Observ. # 2 14 G. MIFFLIN Price 18.75

LOCATION 1
EXPANSION POTENTIAL 1
CONDITION AT TIME OF SALE 5
ELEVATORS IN PLACE 3
FENESTRATION ON UPPER FLOORS 5

Observ. # 3 CENTRE SEVEN-5 & 7 N. PINCKNEY Price 9.23

LOCATION 1
EXPANSION POTENTIAL 1
CONDITION AT TIME OF SALE 1
ELEVATORS IN PLACE 1
FENESTRATION ON UPPER FLOORS 5

Observ. # 4 EMPORIUM-50 E. MIFFLIN Price 20

LOCATION 3
EXPANSION POTENTIAL 5
CONDITION AT TIME OF SALE 3
ELEVATORS IN PLACE 3
FENESTRATION ON UPPER FLOORS 1

Observ. # 5 WOOLWORTH-2 W. MIFFLIN Price 16.99

LOCATION 5
EXPANSION POTENTIAL 3
CONDITION AT TIME OF SALE 3
ELEVATORS IN PLACE 1
FENESTRATION ON UPPER FLOORS 3

The Matrix:

20	20	20	20	20
10	10	10	10	10
15	15	15	15	15
25	25	25	25	25
30	30	30	30	30

Median = 5.861538
Mean = 5.913863
Standard Deviation = .5837666

Weights:

LOCATION = 20
EXPANSION POTENTIAL = 20
CONDITION AT TIME OF SALE = 20
ELEVATORS IN PLACE = 20
FENESTRATION ON UPPER FL = 20

Final Results:

Number of Combinations = 3125
Number of Combinations Adding to 100% = 381

Median = 6.060606
Mean = 6.00175
Standard Deviation = .1893479

Weights:

LOCATION = 10
EXPANSION POTENTIAL = 30
CONDITION AT TIME OF SALE = 25
ELEVATORS IN PLACE = 20
FENESTRATION ON UPPER FL = 15

**** WOOLWORTH DEMONSTRATION ****

EXHIBIT 5 (Continued)

* Attributes = 5

WOOLWORTH - RATGRAM STYLE 2nd RUN

Attribute Names, Prelim. Weights

LOCATION 20
EXPANSION POTENTIAL 20
CONDITION AT TIME OF SALE 20
ELEVATORS IN PLACE 20
FENESTRATION ON UPPER FLOORS 20

* of Observations = 5

Observ. # 1 WOLFF-KUBLY-30 N. CARROLL Price 15.24

LOCATION 3
EXPANSION POTENTIAL 3
CONDITION AT TIME OF SALE 1
ELEVATORS IN PLACE 5
FENESTRATION ON UPPER FLOORS 1

Observ. # 2 14 W. MIFFLIN Price 18.75

LOCATION 1
EXPANSION POTENTIAL 1
CONDITION AT TIME OF SALE 5
ELEVATORS IN PLACE 3
FENESTRATION ON UPPER FLOORS 5

Observ. # 3 CENTRE SEVEN-5 & 7 N. PINCKNEY Price 9.23

LOCATION 1
EXPANSION POTENTIAL 1
CONDITION AT TIME OF SALE 1
ELEVATORS IN PLACE 1
FENESTRATION ON UPPER FLOORS 5

Observ. # 4 EMPORIUM-50 E. MIFFLIN Price 20

LOCATION 3
EXPANSION POTENTIAL 5
CONDITION AT TIME OF SALE 3
ELEVATORS IN PLACE 3
FENESTRATION ON UPPER FLOORS 1

Observ. # 5 WOOLWORTH-2 W. MIFFLIN Price 16.99

LOCATION 5
EXPANSION POTENTIAL 3
CONDITION AT TIME OF SALE 3
ELEVATORS IN PLACE 1
FENESTRATION ON UPPER FLOORS 3

The Matrix:

10	30	25	20	15
0	20	15	10	5
5	25	20	15	10
15	35	30	25	20
20	40	35	30	25

Median = 6.060606
Mean = 6.00175
Standard Deviation = .1893479

Weights:

LOCATION = 10
EXPANSION POTENTIAL = 30
CONDITION AT TIME OF SALE = 25
ELEVATORS IN PLACE = 20
FENESTRATION ON UPPER FL = 15

Final Results:

Number of Combinations = 3125
Number of Combinations Adding to 100% = 381

Median = 6.060606
Mean = 6.00175
Standard Deviation = .1893479

Weights:

LOCATION = 10
EXPANSION POTENTIAL = 30
CONDITION AT TIME OF SALE = 25
ELEVATORS IN PLACE = 20

EXHIBIT 6

WOOLWORTH - RATGRAM STYLE

CALCULATION OF MOST PROBABLE PRICE USING MEAN PRICE PER POINT EQUATION METHOD

COMPARABLE PROPERTY	SELLING PRICE PER SF OF GBA	POINT SCORE	PRICE PER SF OF GBA/ TOTAL WEIGHTED SCORE (x)
1	\$15.24	2.60	\$5.86
2	18.75	3.00	6.25
3	9.23	1.60	5.77
4	20.00	3.30	6.06
5	16.99	2.80	<u>6.08</u>
TOTAL			\$30.02 =====

Total of Price Per SF of GBA = \$30.02
Total Weighted Score

Mean Value ($\bar{x}$) = $30.02/5 = \$6.00$

Standard Deviation = $\sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$ = \$0.19 where:

x	$\bar{x}$	$(x - \bar{x})$	$(x - \bar{x})^2$	n	n-1
\$5.86	\$6.00	= -\$0.14	0.0196	5	4
6.25	6.00	= 0.25	0.0625		
5.77	6.00	= - 0.23	0.0529		
6.06	6.00	= 0.06	0.0036		
6.08	6.00	= 0.08	<u>0.0064</u>		
			0.1450		

$$\sqrt{\frac{0.1450}{4}} = \sqrt{0.03625} = 0.190394 \text{ or } \$0.19$$

EXHIBIT 6 (Continued)

Value Range of Price/Point Score: \$6.00 ± \$0.19

Since GBA of subject is 39,000 square feet and total weighted point score of subject is 2.3, then:

High

Estimate: $\$6.19 \times 2.3 \times 39,000 \text{ SF} = \$555,243 \text{ or } \$560,000$
(\$14.23/SF)

Central

Tendency: $\$6.00 \times 2.3 \times 39,000 \text{ SF} = \$538,200 \text{ or } \$540,000$
(\$13.80/SF)

Low

Estimate: $\$5.81 \times 2.3 \times 39,000 \text{ SF} = \$521,159 \text{ or } \$520,000$
(\$13.36/SF)

JUSTIFICATION OF COMPARABLE PRICE FORMULA FOR
WOOLWORTH BUILDING
BY MEANS OF ANALYSIS OF VARIANCE OF ACTUAL SALE PRICE VS. PREDICTED PRICE
OF COMPARABLES USING MEAN PRICE PER POINT EQUATION METHOD

NO.	COMPARABLE PROPERTY	WEIGHTED POINT SCORE	MEAN PRICE PER POINT SCORE	PREDICTED PRICE/ SF GBA	ACTUAL PRICE/ SF GBA	VARIANCE	% OF VARIANCE TO ACTUAL PRICE
1	WOLFF KUDLY 30 N. Carroll Street	2.60	\$6.00	\$15.60	\$15.24	\$ 0.36	2.4%
2	14 W. Misslin Street	3.00	6.00	18.00	18.75	- 0.75	4.0
3	CENTRE SEVEN 5 & 7 W. Pinckney Street	1.60	6.00	9.60	9.23	0.37	4.0
4	EMPORIUM 50 E. Misslin Street	3.30	6.00	19.80	20.00	- 0.20	1.0
5	WOOLWORTH 2 W. Misslin Street	2.80	6.00	16.80	16.99	- 0.19	1.1
						NET VARIANCE	\$ - 0.41

EXHIBIT 7
RATGRAM STYLE

EXHIBIT 8

WOOLWORTH BUILDING
SCALE FOR SCORING COMPARABLES ON
IMPORTANT INVESTOR CONSIDERATIONS FOR
OFFICE - RETAIL SPACE IN MADISON
C-4 ZONING
DILMORE STYLE

LOCATION
15%

26 = High visibility
15 = Corner visibility limited
10 = Inside lot

EXPANSION POTENTIAL
30%

26 = Potential for significant
increases of floor space
15 = Flexible layouts due to
bay spacing and elevator
position
10 = Inflexibility of layout due
to old bearing walls and
elevator shafts

CONDITION AT
TIME OF PURCHASE
40%

26 = Fully renovated and leased
15 = Long-term retail leases in
place. Serviceable as retail
in tired space.
10 = Vacant and in need of total
rehabilitation. Short-term
lease or large vacancy in
need of total rehabilitation.

ELEVATORS AT
TIME OF PURCHASE
15%

26 = Two passenger and freight
15 = Two passenger
10 = One passenger

WOOLWORTH BUILDING
WEIGHTED MATRIX FOR COMPARABLE PROPERTIES
SCORE/WEIGHTED SCORE
DILMORE STYLE

ATTRIBUTE	WEIGHT	COMPARABLE NO. 1 30 N. CARROLL WOLFF KUBLY	COMPARABLE NO. 2 14 W. MIFFLIN	COMPARABLE NO. 3 5 & 7 E. MIFFLIN CENTRE SEVEN	COMPARABLE NO. 4 50 E. MIFFLIN EMPORIUM	COMPARABLE NO. 5 2 W. MIFFLIN WOOLWORTH	SUBJECT
LOCATION	15%	15/2.25	10/1.50	10/1.50	15/2.25	26/3.90	26/3.90
EXPANSION POTENTIAL AT TIME OF SALE	30%	15/4.50	10/3.00	10/3.00	26/7.80	15/4.50	15/4.50
CONDITION AT TIME OF SALE	40%	10/4.00	26/10.40	10/4.00	15/6.00	15/6.00	10/4.00
ELEVATORS IN PLACE	15%	26/3.90	15/2.25	10/1.50	15/2.25	10/1.50	10/1.50
TOTAL WEIGHTED SCORE	100%	14.65	17.15	10.00	18.30	15.90	13.90
ADJUSTED SELLING PRICE [1]		\$625,000	\$750,000	\$240,000	\$850,000	\$662,500	
DATE OF SALE		7/17/80	2/27/84	12/31/77	4/30/78	7/31/78	
GROSS BUILDING AREA (GBA)		41,000 SF	40,000 SF	26,000 SF	42,500 SF	39,000 SF	39,000 SF
ADJUSTED PRICE/GBA		\$15.24	\$18.75	\$ 9.23	\$20.00	\$16.99	
ADJUSTED PRICE/GBA & WEIGHTED POINT SCORE		\$1.04	\$1.09	\$0.92	\$1.09	\$1.07	

[1] See Appendix _ for assumptions and calculations to determine adjusted selling price.

EXHIBIT 9

Attributes = 5

WOOLWORTH - DILMORE STYLE
1st RUN

Attribute Names, Prelim. Weights
LOCATION 20
EXPANSION POTENTIAL 20
CONDITION AT TIME OF SALE 20
ELEVATORS IN PLACE 20
PENESTRATION ON UPPER FLOORS 20

of Observations = 5

Observ. # 1 WOLFF-KUBLY Price 15.24
LOCATION 15
EXPANSION POTENTIAL 15
CONDITION AT TIME OF SALE 10
ELEVATORS IN PLACE 26
PENESTRATION ON UPPER FLOORS 10
Observ. # 2 14 W. MIFFLIN Price 18.75
LOCATION 10
EXPANSION POTENTIAL 10
CONDITION AT TIME OF SALE 26
ELEVATORS IN PLACE 15
PENESTRATION ON UPPER FLOORS 26
Observ. # 3 CENTRE SEVEN Price 9.23
LOCATION 10
EXPANSION POTENTIAL 10
CONDITION AT TIME OF SALE 10
ELEVATORS IN PLACE 10
PENESTRATION ON UPPER FLOORS 26
Observ. # 4 EMPORIUM Price 20
LOCATION 15
EXPANSION POTENTIAL 26
CONDITION AT TIME OF SALE 15
ELEVATORS IN PLACE 15
PENESTRATION ON UPPER FLOORS 10
Observ. # 5 WOOLWORTH Price 16.99
LOCATION 26
EXPANSION POTENTIAL 15
CONDITION AT TIME OF SALE 15
ELEVATORS IN PLACE 10
PENESTRATION ON UPPER FLOORS 15

The Matrix:

20	20	20	20	20
10	10	10	10	10
15	15	15	15	15
25	25	25	25	25
30	30	30	30	30

Median = 1.048765
Mean = 1.012559
Standard Deviation = .1956356

Weights:
LOCATION = 20
EXPANSION POTENTIAL = 20
CONDITION AT TIME OF SALE = 20
ELEVATORS IN PLACE = 20
PENESTRATION ON UPPER FL = 20

Final Results:
Number of Combinations = 3125
Number of Combinations Adding to 100% = 381

Median = 1.068953
Mean = 1.024281
Standard Deviation = .1314307

Weights:
LOCATION = 15
EXPANSION POTENTIAL = 30
CONDITION AT TIME OF SALE = 30
ELEVATORS IN PLACE = 15
PENESTRATION ON UPPER FL = 10

**** WOOLWORTH-DILMORE STYLE ****

EXHIBIT 10 (Continued)

Attributes = 5

WOOLWORTH - DILMORE STYLE
2nd RUN

Attribute Names, Prelim. Weights

LOCATION 20
EXPANSION POTENTIAL 20
CONDITION AT TIME OF SALE 20
ELEVATORS IN PLACE 20
PENESTRATION ON UPPER FLOORS 20

of Observations = 5

Observ. # 1: WOLFF-KUBLY Price 15.24

LOCATION 15
EXPANSION POTENTIAL 15
CONDITION AT TIME OF SALE 10
ELEVATORS IN PLACE 26
PENESTRATION ON UPPER FLOORS 10

Observ. # 2 14 W. MIFFLIN Price 18.75

LOCATION 10
EXPANSION POTENTIAL 10
CONDITION AT TIME OF SALE 26
ELEVATORS IN PLACE 15
PENESTRATION ON UPPER FLOORS 26

Observ. # 3 CENTRE SEVEN Price 9.23

LOCATION 10
EXPANSION POTENTIAL 10
CONDITION AT TIME OF SALE 10
ELEVATORS IN PLACE 10
PENESTRATION ON UPPER FLOORS 26

Observ. # 4 EMPORIUM Price 20

LOCATION 15
EXPANSION POTENTIAL 26
CONDITION AT TIME OF SALE 15
ELEVATORS IN PLACE 15
PENESTRATION ON UPPER FLOORS 10

Observ. # 5 WOOLWORTH Price 16.99

LOCATION 26
EXPANSION POTENTIAL 15
CONDITION AT TIME OF SALE 15
ELEVATORS IN PLACE 10
PENESTRATION ON UPPER FLOORS 15

The Matrix:

15	30	30	15	10
5	20	20	5	0
10	25	25	10	5
20	35	35	20	15
25	40	40	25	20

Median = 1.068553
Mean = 1.024281
Standard Deviation = .1314337

Weights:

LOCATION = 15
EXPANSION POTENTIAL = 30
CONDITION AT TIME OF SALE = 30
ELEVATORS IN PLACE = 15
PENESTRATION ON UPPER FL = 10

Final Results:

Number of Combinations = 3125
Number of Combinations Adding to 100% = 381

Median = 1.068553
Mean = 1.043603
Standard Deviation = 7.084803E-02

Weights:

LOCATION = 15
EXPANSION POTENTIAL = 30
CONDITION AT TIME OF SALE = 40

EXHIBIT 11

WOOLWORTH BUILDING CALCULATION OF MOST PROBABLE PRICE USING MEAN PRICE PER POINT EQUATION METHOD DILMORE STYLE

COMPARABLE PROPERTY	SELLING PRICE PER SF OF GBA	POINT SCORE	PRICE PER SF OF GBA/ TOTAL WEIGHTED SCORE (x)
1	\$15.24	14.65	\$1.04
2	18.75	17.15	1.09
3	9.23	10.00	0.92
4	20.00	18.30	1.09
5	16.99	15.90	<u>1.07</u>
TOTAL			\$5.21

Total of $\frac{\text{Price Per SF of GBA}}{\text{Total Weighted Score}} = \5.21

Mean Value ($\bar{x}$) = $\$5.21 \div 5 = \1.04

Standard Deviation of the Mean = $\sqrt{\frac{\sum (x - \bar{x})^2}{n-1}} = \0.07 where:

x	$\bar{x}$	$(x - \bar{x})$	$(x - \bar{x})^2$	n	n-1
\$1.04	\$1.04	=	\$0.00	5	4
1.09	1.04	=	0.05		
0.92	1.04	=	0.12		
1.09	1.04	=	0.05		
1.07	1.04	=	0.03		
			0.0000		
			0.0025		
			0.0144		
			0.0025		
			<u>0.0009</u>		
			0.0203		

$$\sqrt{\frac{0.0203}{4}} = \sqrt{0.005075} = 0.071239 \text{ or } \$0.07$$

EXHIBIT 11 (Continued)

Value Range of Price/Point Score: \$1.04 ± \$0.07

Since GBA of subject is 39,000 square feet and total weighted point score of subject is 13.90, then:

High

Estimate: \$1.11 x 13.90 x 39,000 SF = \$601,731 or \$600,000
(\$15.43/SF)

Central

Tendency: \$1.04 x 13.90 x 39,000 SF = \$563,784 or \$560,000
(\$14.46/SF)

Low

Estimate: \$0.97 x 13.90 x 39,000 SF = \$525,837 or \$530,000
(\$13.48/SF)

COMPARISON OF WOOLWORTH DEMONSTRATION -
RATGRAM STYLE
AND WOOLWORTH - DILMORE STYLE

	=====		
			% VARIANCE
	RATGRAM STYLE	DILMORE STYLE	RATGRAM TO DILMORE

Estimated Value			
Central Tendency	\$540,000	\$560,000	3.7%

JUSTIFICATION OF COMPARABLE PRICE FORMULA FOR
WOOLWORTH BUILDING
BY MEANS OF ANALYSIS OF VARIANCE OF ACTUAL SALE PRICE VS. PREDICTED PRICE
OF COMPARABLES USING MEAN PRICE PER POINT EQUATION METHOD
DILMORE STYLE

NO.	COMPARABLE PROPERTY	WEIGHTED POINT SCORE	MEAN PRICE PER POINT SCORE	PREDICTED PRICE/ SF GBA	ACTUAL PRICE/ SF GBA	VARIANCE	% OF VARIANCE TO ACTUAL PRICE
1	WOLFF KUBLY 30 N. Carroll Street	14.65	\$1.04	\$15.24	\$15.24	\$ 0.00	0.0%
2	14 W. Mifflin Street	17.15	1.04	17.84	18.75	- 0.91	4.9
3	CENTRE SEVEN 5 & 7 N. Pinckney Street	10.00	1.04	10.40	9.23	1.17	12.7
4	EMPORIUM 50 E. Mifflin Street	18.30	1.04	19.03	20.00	- 0.97	4.9
5	WOOLWORTH 2 W. Mifflin Street	15.90	1.04	16.54	16.99	- 0.45	2.6
NET VARIANCE						\$ - 1.16	

EXHIBIT 12

EXHIBIT 13

SAMPLE OF EXPERIMENTAL
AUTOMATED MARKET COMPARISON PROCESS.

DILMORE
AND
GRAASKAMP

EXHIBIT 13 (Continued)

SCALE FOR SCORING COMPARABLE SALES
 BASED UPON PRICE SENSITIVE ATTRIBUTES
 GOODWILL BUILDING

ATTRIBUTE	WEIGHT	SCORE
GROSS BUILDING AREA	30%	5 = Building less than 15,000 SF of GBA 3 = Building between 15,000 SF to 40,000 SF of GBA 1 = Building greater than 40,000 SF of GBA
LOCATION	30%	5 = Located in South Madison Industrial Park area with or without rail siding or along major highway with rail siding 3 = Located along or visible from a major road such as Highways 51, 151, 113, or 30 in a mixed use area without rail siding. 1 = Located in more isolated commercial mixed use area without rail siding
RATIO OF LAND TO GBA	10%	5 = Greater than 4:1 3 = Between 4:1 and 2.5:1 1 = Less than 2.5:1
EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION USES	10%	5 = Efficient layout for accessibility of stored goods with adequate number of overhead doors and truck height loading docks 3 = Adequate layout with limited number of overhead doors and truck height docks 1 = Deep space with inadequate number of overhead doors and truck height doors
QUALITY OF HVAC SYSTEM	20%	5 = Fully insulated with heat in warehouse and office area 3 = Partially heated warehouse space and adequate heated office space 1 = Minimal heat, if any, in warehouse area and small heated office space

WEIGHTED MATRIX FOR COMPARABLE PROPERTIES
SCORE/WEIGHTED SCORE
GOODWILL BUILDING

ATTRIBUTE	WEIGHT	COMPARABLE NO. 1 1115 O'Neill St.	COMPARABLE NO. 2 2810 Bryant St.	COMPARABLE NO. 3 910 Watson Ave.	COMPARABLE NO. 4 4401 Cottage Grove Rd.	COMPARABLE NO. 5 4610 - 4622 Fairrite Rd.	COMPARABLE NO. 6 3103 Hatford Way	SUBJECT 2422 Pennsylvania
GROSS BUILDING AREA (GBA)	30%	5/1.50	3/0.90	1/0.30	3/0.90	5/1.50	5/1.50	3/0.90
LOCATION	30%	1/0.30	3/0.90	5/1.50	5/1.50	3/0.90	5/1.50	3/0.90
RATIO OF LAND TO GBA	10%	3/0.30	1/0.10	1/0.10	5/0.50	3/0.30	1/0.10	1/0.10
EFFICIENCY OF BUILDING DESIGN	10%	3/0.30	1/0.10	1/0.10	5/0.50	5/0.50	3/0.30	1/0.10
QUALITY OF HVAC SYSTEM	20%	5/1.00	3/0.60	3/0.60	1/0.20	5/1.00	1/0.20	5/1.00
TOTAL WEIGHTED SCORE	100%	3.40	2.60	2.60	3.60	4.20	3.60	3.00
CASH SELLING PRICE		\$200,000	\$212,000	\$425,000	\$525,000	\$301,000	\$209,000	
DATE OF SALE		6/27/84	6/12/83	6/30/83	1/4/82	2/29/84	6/30/82	
GROSS BUILDING AREA (GBA)		13,632 SF	19,760 SF	57,800 SF	34,517 SF	17,300 SF	14,000 SF	30,195 SF
CASH PRICE/ SF OF GBA		\$14.46	\$10.73	\$10.61	\$15.21	\$17.40	\$14.94	
CASH PRICE PER SF/ WEIGHTED POINT SCORE		\$4.2529	\$4.1269	\$4.1577	\$4.2250	\$4.1429	\$4.1500	

EXHIBIT 13 (Continued)

JUSTIFICATION OF COMPARABLE PRICE FORMULA
FOR THE GOODWILL BUILDING
BY MEANS OF ANALYSIS OF VARIANCE OF ACTUAL SALE PRICE
VS. PREDICTED PRICE OF COMPARABLES
USING MEAN PRICE PER POINT EQUATION METHOD

NO.	COMPARABLE SALE	WEIGHTED POINT SCORE	MEAN PRICE PER POINT SCORE	PREDICTED PRICE PER SF OF GBA	ACTUAL PRICE PER SF OF GBA	VARIANCE	% OF VARIANCE TO ACTUAL PRICES
1	1115 O'Neill Street	3.40	\$4.18	14.21	14.46	- 0.25	1.7%
2	2810 Bryant Street	2.60	4.18	10.87	10.73	0.14	1.3%
3	901 Watson Avenue	2.60	4.18	10.87	10.81	0.06	0.6%
4	4401 Cottage Grove Road	3.60	4.18	15.05	15.21	- 0.16	1.1%
5	4610-22 Femrite Road	4.20	4.18	17.56	17.40	0.16	0.9%
6	3103 Watford Way	3.60	4.18	15.05	14.94	0.11	0.7%
NET VARIANCE						\$ 0.06	

EXHIBIT 13 (Continued)

EXHIBIT 13 (Continued)

GOODWILL BUILDING

CALCULATION OF MOST PROBABLE PRICE USING
MEAN PRICE PER POINT EQUATION METHOD

COMPARABLE PROPERTY	CASH SELLING PRICE PER SF OF GBA	WEIGHTED POINT SCORE	PRICE PER SF OF GBA/TOTAL WEIGHTED SCORE (x)
1	\$14.46	3.40	\$4.25
2	10.73	2.60	4.13
3	10.81	2.60	4.16
4	15.21	3.60	4.23
5	17.40	4.20	4.14
6	14.94	3.60	<u>4.15</u>
TOTAL			\$25.06

Total of Price per SF of GBA = \$25.06
Total Weighted Score

Mean Value (x) = \$25.06/6 = \$4.18

Standard Deviation = $\sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$ = \$0.05 where:

<u>x</u>	<u>$\bar{x}$</u>	<u>$(x - \bar{x})$</u>	<u>$(x - \bar{x})^2$</u>	<u>n</u>	<u>n - 1</u>
4.25	4.18	0.07	0.0049	6	5
4.13	4.18	= - 0.05	0.0025		
4.16	4.18	= - 0.02	0.0004		
4.23	4.18	= 0.05	0.0025		
4.14	4.18	= - 0.04	0.0016		
4.15	4.18	= - 0.03	<u>0.0009</u>		
			0.0128		

$$\sqrt{\frac{0.0128}{5}} = 0.050596$$

ESTIMATED RANGE OF MOST PROBABLE SELLING PRICE
OF THE GOODWILL BUILDING

	SCORE FOR SUBJECT	MEAN VALUE +/- \$0.05/POINT SCORE	PRICE/SF OF GBA	GBA OF SUBJECT	ESTIMATED VALUE
LOW ESTIMATE	3.00	\$4.13	\$12.39	30,195 SF	\$374,116 or \$374,000
CENTRAL TENDENCY	3.00	\$4.18	\$12.54	30,195 SF	\$378,645 or \$379,000
HIGH ESTIMATE	3.00	\$4.23	\$12.69	30,195 SF	\$383,175 or \$383,000

EXHIBIT 13 (Continued)

EXHIBIT 14

COMPUTER OUTPUT OF DILMORE QUANTITATIVE
POINT WEIGHTING PROGRAM
AND
COMPUTERIZATION OF
ALL OF THE MARKET COMPARISON
CALCULATIONS

EXHIBIT 14 (Continued)

**** GOODWILL 3 ****

Attributes = 5

Attribute Names, Prelim. Weights ← Preliminary weights selected by the appraisers
 GROSS BUILDING AREA (GBA) 20
 LOCATION 20
 RATIO OF LAND TO GBA 20
 EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION 20
 QUALITY OF HVAC SYSTEM 20

of Observations = 6 ← Comparable sales with score for each comparable

Observ. # 1 1115 O'NEILL ST Price 14.46
 GROSS BUILDING AREA (GBA) 5
 LOCATION 1
 RATIO OF LAND TO GBA 3
 EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION 3
 QUALITY OF HVAC SYSTEM 5
 Observ. # 2 2810 BRYANT ST Price 10.73
 GROSS BUILDING AREA (GBA) 3
 LOCATION 3
 RATIO OF LAND TO GBA 1
 EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION 1
 QUALITY OF HVAC SYSTEM 3
 Observ. # 3 901 WATSON AVE Price 10.81
 GROSS BUILDING AREA (GBA) 1
 LOCATION 5
 RATIO OF LAND TO GBA 1
 EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION 1
 QUALITY OF HVAC SYSTEM 3
 Observ. # 4 4401 COTTAGE GROVE RD Price 15.21
 GROSS BUILDING AREA (GBA) 3
 LOCATION 5
 RATIO OF LAND TO GBA 5
 EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION 5
 QUALITY OF HVAC SYSTEM 1
 Observ. # 5 4610-22 FERMI RD Price 17.4
 GROSS BUILDING AREA (GBA) 5
 LOCATION 3
 RATIO OF LAND TO GBA 3
 EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION 5
 QUALITY OF HVAC SYSTEM 5
 Observ. # 6 3103 WATFORD WAY Price 14.94
 GROSS BUILDING AREA (GBA) 5
 LOCATION 5
 RATIO OF LAND TO GBA 1
 EFFICIENCY OF BUILDING DESIGN FOR STORAGE AND DISTRIBUTION 3
 QUALITY OF HVAC SYSTEM 1

The Matrix: ← Test matrix to select optimal combination of weights
 20 20 20 20 20
 10 10 10 10 10
 15 15 15 15 15
 25 25 25 25 25
 30 30 30 30 30

EXHIBIT 14 (Continued)

Median = 4.565106 ← Initial results using
Mean = 4.528223 appraiser's weights
Standard Deviation = .441591

Weights: ← Appraiser's initial weights
GROSS BUILDING AREA (GBA = 20
LOCATION = 20
RATIO OF LAND TO GBA = 20
EFFICIENCY OF BUILDING D = 20
QUALITY OF HVAC SYSTEM = 20

Final Results: ← Iterations to
Number of Combinations = 3125 select optimal
Number of Combinations Adding to 100% = 381 weight

Median = 4.153846 ← Final results using
Mean = 4.175902 optimal weights
Standard Deviation = 5.067353E-02

Weights: ← Optimal weights
GROSS BUILDING AREA (GBA = 30
LOCATION = 30
RATIO OF LAND TO GBA = 10
EFFICIENCY OF BUILDING D = 10
QUALITY OF HVAC SYSTEM = 20

EXHIBIT 14 (Continued)

COMPUTERIZATION OF ALL MARKET COMPARISON CALCULATIONS

Program Choices Are:

- ~~1.~~ Enter/edit/display/file input data
- 2. Analyze quality point ratings
- 3. Display output to screen
- ~~4.~~ Print output to printer
- 5. Select options
- 6. Quit

Enter your choice: ? 1

Load/edit file options Current disk file: None

- 1. Create new data file
- ~~2.~~ Load existing disk file for editing
- 3. Display current data
- 4. Edit current data
- ~~5.~~ Save current data to disk file
- 6. Clear (erase) all current data
- 7. Quit load/edit options, return to main program

Enter selection number:

Enter selection number: 1

Enter new data

Enter heading for output: INDUSTRIAL WAREHOUSE

Enter number of attributes: ? 5

Enter name for attribute: 1 ? GROSS BUILDING AREA (GBA)

Preliminary weight: 1 ? 20

Enter name for attribute: 2 ? LOCATION

Preliminary weight: 2 ? 20

Enter name for attribute: 3 ? RATIO OF LAND TO GBA

Preliminary weight: 3 ? 20

Enter name for attribute: 4 ? EFFICIENCY OF BUILDING DESIGN -

Preliminary weight: 4 ? 20

Enter name for attribute: 5 ? QUALITY OF HVAC SYSTEM

Weight for QUALITY OF HVAC SYSTEM is 20, so that total of weights is 100.

EXHIBIT 14 (Continued)

```
Enter number of observations: ? 6
Do you want to (1) Enter a unit price or
                (2) Enter a total price & size
Enter your choice: ? 1
```

```

Observation number 1 :
Enter name 1 ? 1115 O'NEILL ST.
Enter price 1 ? 14.46

```

- Score for GROSS BUILDING AREA (GBA)? 5
- Score for LOCATION? 1
- Score for RATIO OF LAND TO GBA? 3
- Score for EFFICIENCY OF BUILDING DESIGN? 3
- Score for QUALITY OF HVAC SYSTEM? 5

```

Observation number 2 :
Enter name 2 ? 2810 BRYANT ST.
Enter price 2 ? 10.73

```

```
Score for GROSS BUILDING AREA (GBA)? 3
Score for LOCATION? 3
Score for RATIO OF LAND TO GBA? 1
Score for EFFICIENCY OF BUILDING DESIGN? 1
Score for QUALITY OF HVAC SYSTEM? 3
```

Observation number 3 :
Enter name 3 ?

Score for QUALITY OF HVAC SYSTEM? 3

```

Observation number 3 :
Enter name 3 ? 910 WATSON AVE.
Enter price 3 ? 10.81

```

```
Score for GROSS BUILDING AREA (GBA)? 1
Score for LOCATION? 5
Score for RATIO OF LAND TO GBA? 1
Score for EFFICIENCY OF BUILDING DESIGN? 1
Score for QUALITY OF HVAC SYSTEM? 3
```

```

Observation number 4 :
Enter name 4 ? 4401 COTTAGE GROVE RD.
Enter price 4 ? 15.21

```

Score for GROSS BUILDING AREA (GBA)? 3
Score for LOCATION? 5
Score for RATIO OF LAND TO GBA? 5
Score for EFFICIENCY OF BUILDING DESIGN? 5
Score for QUALITY OF HVAC SYSTEM? 1

EXHIBIT 14 (Continued)

Observation number 5 :

Enter name 5 ?

Score for QUALITY OF HVAC SYSTEM? 1

~~Observation number 5 :~~

Enter name 5 ? 4610-22 FEMRITE RD.

Enter price 5 ? 17.40

Score for GROSS BUILDING AREA (GBA)? 5

Score for LOCATION? 3

~~Score for RATIO OF LAND TO GBA? 3~~

Score for EFFICIENCY OF BUILDING DESIGN? 5

Score for QUALITY OF HVAC SYSTEM? 5

Observation number 6 :

Enter name 6 ? 3103 WATFORD WAY

Enter price 6 ? 14.94

Score for GROSS BUILDING AREA (GBA)? 5

Score for LOCATION? 5

Score for RATIO OF LAND TO GBA? 1

Score for EFFICIENCY OF BUILDING DESIGN? 3

Score for QUALITY OF HVAC SYSTEM? 1

Enter subject property name:? INDUSTRIAL WAREHOUSE

Enter the name of the designated unit of comparison
(acre, square foot, etc.) ? SQUARE FOOT

Enter number of units of comparison for subject
(acres, square feet, etc.) ? 30195

Enter attribute scores for subject property

GROSS BUILDING AREA (GBA) ? 3

LOCATION ? 3

RATIO OF LAND TO GBA ? 1

EFFICIENCY OF BUILDING DESIGN? 1

QUALITY OF HVAC SYSTEM ? 5

EXHIBIT 14 (Continued)

Load/edit file options Current disk file: None

1. Create new data file
2. Load existing disk file for editing
3. Display current data
4. ~~Edit current data~~
5. Save current data to disk file
6. Clear (erase) all current data
7. Quit load/edit options, return to main program

Enter selection number: 5

Enter name for data file: ? SAMPLE

Load/edit file options Current disk file: SAMPLE

1. Create new data file
2. ~~Load existing disk file for editing~~
3. Display current data
4. Edit current data
5. ~~Save current data to disk file~~
6. Clear (erase) all current data
7. Quit load/edit options, return to main program

Enter selection number: 3

Project title: INDUSTRIAL WAREHOUSE

Unit prices Search interval = 5

	GROSS LOCAT RATIO EFFIC QUALI					Price
Prel. wts.	20	20	20	20	20	-
1115 O'NEIL	5	1	3	3	5	\$14.46
2810 BRYANT	3	3	1	1	3	\$10.73
910 WATSON	1	5	1	1	3	\$10.81
4401 COTTAG	3	5	5	5	1	\$15.21
4610-22 FEM	5	3	3	5	5	\$17.40
3103 WATFOR	5	5	1	3	1	\$14.94
INDUSTRIAL	3	3	1	1	5	-

Press any key to continue

EXHIBIT 14 (Continued)

QP

Version 2.1

Program Choices Are:

1. Enter/edit/display/file input data
2. Analyze quality point ratings
3. Display output to screen
4. Print output to printer
- 5. Select options
6. Quit

Enter your choice: ? 2

Pass # 1 Combination # 6

Standard deviation = .4693161 Mean = 4.497911

Status	GROSS	LOCAT	RATIO	EFFIC	QUALI	S.D.	Mean
Prelim. Wts.	20	20	20	20	0	.441591	4.528223

EXHIBIT 14 (Continued)

QP

Version 2.1

Program Choices Are:

1. Enter/edit/display/file input data
2. Analyze quality point ratings
3. Display output to screen
4. Print output to printer
5. Select options
6. Quit

Enter your choice: ? 3

Display Output to Screen

Select output to be displayed:

1. Weighted matrix for properties
2. Value range determination: mean price per point method
3. Value range per unit of dispersion
4. Transaction zone: mean price per point method
5. Transaction zone: linear regression method
6. Mean price per point method: predicted vs. actual price for comparables
7. Linear regression method: predicted vs. actual price for comparables
8. Input data
9. Computation matrix

<Return> to quit

Enter your choice: 1

EXHIBIT 14 (Continued)

Feature/ Attribute	Weighted Matrix					Wtd. score
	GROSS	BU	LOCATION	RATIO OF	EFFICIEN	QUALITY
Initial weights	20	20	20	20	0	100--
Final weights	30	30	10	10	20	100
1115 O'NEILL S S/	1.50	1/	0.30	3/	0.30	5/ 1.00 3.40
2810 BRYANT ST 3/	0.90	3/	0.90	1/	0.10	3/ 0.60 2.60
910 WATSON AVE 1/	0.30	5/	1.50	1/	0.10	3/ 0.60 2.60
4401 COTTAGE G 3/	0.90	5/	1.50	5/	0.50	5/ 0.50 1/ 0.20 3.60
4610-22 FEMRIT S/	1.50	3/	0.90	3/	0.30	5/ 0.50 5/ 1.00 4.20
3103 WATFORD W 5/	1.50	5/	1.50	1/	0.10	3/ 0.30 1/ 0.20 3.60
INDUSTRIAL WAR 3/	0.90	3/	0.90	1/	0.10	5/ 1.00 3.00

Press any key to continue

EXHIBIT 14 (Continued)

Display Output to Screen

Select output to be displayed:

- ~~1. Weighted matrix for properties~~
2. Value range determination: mean price per point method
3. Value range per unit of dispersion
- ~~4. Transaction zone: mean price per point method~~
5. Transaction zone: linear regression method
6. Mean price per point method: predicted vs. actual price for comparables
- ~~7. Linear regression method: predicted vs. actual price for comparables~~
8. Input data
9. Computation matrix

<Return> to quit

Enter your choice: 2 (and 3)

Value Range Determination: Mean Price Per Point Method

Mean price per point:	\$4.18
Dispersion About the Mean:	\$0.05
Coefficient of Dispersion:	0.0121

Value Range Per Unit of Dispersion

	Subject Point Score		Mean (+/- One Standard Deviation)		Price Per Unit
Low Estimate	3.00	X	\$4.13	=	\$12.38
Central Tendency	3.00	X	\$4.18	=	\$12.53
High Estimate	3.00	X	\$4.23	=	\$12.68

Press any key to continue

EXHIBIT 14 (Continued)

Display Output to Screen

Select output to be displayed:

1. Weighted matrix for properties
2. Value range determination: mean price per point method
3. Value range per unit of dispersion
4. Transaction zone: mean price per point method
5. Transaction zone: linear regression method
6. Mean price per point method: predicted vs. actual price for comparables
7. Linear regression method: predicted vs. actual price for comparables
8. Input data
9. Computation matrix

<Return> to quit

Enter your choice: 4

(and 5)

Transaction Zone: Mean Price Per Point Method

Number of units in subject property: 30195

Low Estimate	\$373,679	or	\$374,000
Central Tendency	\$378,274	or	\$378,000
High Estimate	\$382,869	or	\$383,000

Transaction Zone: Linear Regression Method

a = -7.505322E-02 Standard Error of the Forecast = .2056632
b = 4.200016

Prediction equation: price =

30195 units X [-7.505322E-02 + (4.200016 +/- .2056632) X 3]

Low Estimate	\$359,562	or	\$360,000
Central Tendency	\$378,192	or	\$378,000
High Estimate	\$396,822	or	\$397,000

Press any key to continue

EXHIBIT 14 (Continued)

Display Output to Screen

Select output to be displayed:

- 1. Weighted matrix for properties
- 2. Value range determination: mean price per point method
- 3. Value range per unit of dispersion
- 4. Transaction zone: mean price per point method
- 5. Transaction zone: linear regression method
- 6. Mean price per point method: predicted vs. actual price for comparables
- 7. Linear regression method: predicted vs. actual price for comparables
- 8. Input data
- 9. Computation matrix

<Return> to quit

Enter your choice: 6

Mean Price Per Point Method: Predicted vs. Actual Price for Comparables

	Predicted Price	Actual price	Error
1115 O'NEILL ST.	\$14.20	\$14.46	-\$0.26
2810 BRYANT ST.	\$10.86	\$10.73	\$0.13
910 WATSON AVE.	\$10.86	\$10.81	\$0.05
4401 COTTAGE GROVE	\$15.03	\$15.21	-\$0.18
4610-22 FEMRITE RD	\$17.54	\$17.40	\$0.14
3103 WATFORD WAY	\$15.03	\$14.94	\$0.09

Press any key to continue

EXHIBIT 14 (Continued)

Display Output to Screen

Select output to be displayed:

1. Weighted matrix for properties
2. Value range determination: mean price per point method
3. Value range per unit of dispersion
4. Transaction zone: mean price per point method
5. Transaction zone: linear regression method
6. ~~Mean price per point method: predicted vs. actual price for comparables~~
7. Linear regression method: predicted vs. actual price for comparables
8. Input data
9. Computation matrix

<Return> to quit

Enter your choice: 7

Linear Regression Method: Predicted vs. Actual Price for Comparables

	Predicted Price	Actual price	Error
1115 O'NEILL ST.	\$14.20	\$14.46	-\$0.26
2810 BRYANT ST.	\$10.84	\$10.73	\$0.11
910 WATSON AVE.	\$10.84	\$10.81	\$0.03
4401 COTTAGE GROVE	\$15.05	\$15.21	-\$0.16
4410-22 FEMRITE RD	\$17.57	\$17.40	-\$0.17
3103 WATFORD WAY	\$15.05	\$14.94	\$0.11

Press any key to continue

EXHIBIT 14 (Continued)

Display Output to Screen

Select output to be displayed:

1. Weighted matrix for properties
2. Value range determination: mean price per point method
3. Value range per unit of dispersion
4. Transaction zone: mean price per point method
5. Transaction zone: linear regression method
6. Mean price per point method: predicted vs. actual price for comparables
7. Linear regression method: predicted vs. actual price for comparables
8. Input data
9. Computation matrix

<Return> to quit

Enter your choice: 8

Project title: INDUSTRIAL WAREHOUSE

Unit prices Search interval = 5

	GROSS	LOCAT	RATIO	EFFIC	QUALI	Price
Prel. wts.	30	30	10	10	20	-
1115 O'NEIL	5	1	3	3	5	\$14.46
2810 BRYANT	3	3	1	1	3	\$10.73
910 WATSON	1	5	1	1	3	\$10.81
4401 COTTAG	3	5	5	5	1	\$15.21
4610-22 FEM	5	3	3	5	5	\$17.40
3103 WATFOR	5	5	1	3	1	\$14.94
INDUSTRIAL	3	3	1	1	5	-

Press any key to continue

EXHIBIT 14 (Continued)

Display Output to Screen

Select output to be displayed:

1. Weighted matrix for properties
2. Value range determination: mean price per point method
3. Value range per unit of dispersion
4. Transaction zone: mean price per point method
5. Transaction zone: linear regression method
6. Mean price per point method: predicted vs. actual price for comparables
- ~~7. Linear regression method: predicted vs. actual price for comparables~~
8. Input data
9. Computation matrix

<Return> to quit

Enter your choice: 9

Computation Matrix

20	20	20	20	0
10	10	10	10	10
15	15	15	15	15
25	25	25	25	25
30	30	30	30	30

Press any key to continue

EXHIBIT 14 (Continued)

Display Output to Screen

Select output to be displayed:

1. Weighted matrix for properties
2. Value range determination: mean price per point method
3. Value range per unit of dispersion
4. Transaction zone: mean price per point method
5. Transaction zone: linear regression method
6. Mean price per point method: predicted vs. actual price for comparables
7. Linear regression method: predicted vs. actual price for comparables
8. Input data
9. Computation matrix

<Return> to quit

Enter your choice: 10

Iterations

	GROSS	LOCAT	RATIO	EFFIC	QUALI	S.D.	Mean
Prelim. Wts.	20	20	20	20	20	.441591	4.528223
Pass # 1	30	30	10	10	20	5.067353E-02	4.175902
Pass # 2	30	30	10	10	20	5.067353E-02	4.175902

Press any key to continue

EXHIBIT 14 (Continued)

QP

Version 2.1

Program Choices Are:

- ~~1. Enter/edit/display/file input data~~
2. Analyze quality point ratings
3. Display output to screen
4. Print output to printer
5. Select options
6. Quit

Enter your choice: ? 5

Special options

Enter your selection:

-
1. Change search interval

<Return> for no changes

Enter your choice: ? 5

May be draft -

Twentieth Anniversary Celebration

CENTER FOR REAL ESTATE & URBAN ECONOMIC STUDIES
The University of Connecticut

October 25, 1985

"Market Comparison Methods Are Not Statistical or Lyrical,
But Are Set (Theory) in Their Ways in a Flight FROM Degrees of Freedom:
Or Bill Shenkel Was Right With His Naive Theory of Comparability"

- A. Market inference is the preferred method of valuation if we can discover a pricing pattern in the random dots of properties and transactions. The search for pattern must also be consistent with appraisal protocol.
 - 1. Valuation directly from a regression formula violates appraisal protocol if the appraiser has not inspected all of the comparables used, because the subject property is compared to a hypothetical mean property from the set of observations, and because the appraiser is not directly responsible for the selection or weights given the attributes selected as the basis of comparison. Moreover, the amount of data points were limited relative to the number of variables which were thought to be relevant so that the risk characteristic of statistical variance were also suspect.
 - 2. Market comparison is set theory using a limited number of subjectively selected properties in a relatively objective comparison on a few factors thought to be highly correlated to prices paid. An additive weighting system is one method for managing the information integration for a market comparison.
- B. One inferential method is to develop a pricing algorithm which provides an estimated price for each comparable and then presumes the same algorithm can be applied to the subject property. The steps involved are as follows:
 - 1. Adjust prices for terms of sale and time on comparable properties. Comparable properties would be those bought for renovation, or for the owners own use, etc. You may choose to abstract out land values where size or locational quality is significantly different.
 - 2. Selecting a proper unit of comparison
 - 3. Developing a hierarchy of significant attributes thought to affect price and scoring each property on a point system
 - 4. Developing a weighting system to rank the relative importance of ordinal attribute scores on a cardinal scale
 - 5. Developing a price per weighted point per unit of comparison
 - 6. Testing the price weighting formula for best estimate of the sales price of actual comparables in order to minimize dispersion and variance between actual price and price estimated by formula

7. Application of a price per point formula to the subject property to estimate range of alternative prices
 8. Adjustment of predicted price for unique externalities such as land, financing, or non-transferable license
- C. Search for an appropriate unit of comparison as a single variable in a linear regression by trying three or four unit concepts, such as:
1. Gross building area
 2. Net leasable area
 3. Cubage
 4. Two times the first floor area plus gross building area
 5. Barrels of cranberries rather than acres of cranberries
 6. Number of bedrooms rather than square feet
- D. Arrive at a price per unit as the first step in establishing a price algorithm
- E. Identify property attributes which distinguish subject properties qualitatively from one another and develop a simple scoring system
1. 5-3-1 is one method, but scores may become multipliers and lead to distortion
 2. Dilmore prefers:

<u>Rating</u>	<u>Points</u>
Excellent	26
Good	20
Average	15
Fair	13
Poor	10

CONTEMPORARY REAL ESTATE APPRAISAL SEMINAR

University of Texas - Austin
September 19, 1980

I. Inferring Future Price From Sales Data

- A. For residential properties there are often many sales of similar properties so that powerful statistical tools can be brought into play, such as multiple regression, factor analysis, etc. However, the simple average can also lend itself to statistical inference.
- B. Dispersion is the variation or scatter of a set of values. Measures of dispersion are needed for the following basic purposes:
 - 1. To gauge the descriptive reliability of averages.
 - 2. To serve as a basis for control of the variability itself (such as rejecting a comparable that lies outside a certain range).
 - 3. To summarize facts, both an average and a measure of dispersion should be presented.
- C. When dispersion is small, then the selected average is a typical value in that it closely represents the individual values in the set and it is reliable in that it is a good estimate describing the typical case in the population. It is a useful generalization. Conversely, an average with very great dispersion is not very descriptive of the data set and may be a misleading generalization.
- D. Measures of dispersion include:
 - 1. A range
 - 2. The quartile deviation
 - 3. The mean deviation
 - 4. The standard deviation
- E. Consider the data on some apartment site land sales in Madison provided in Exhibits 1, 2, and 3. The range is the difference between the largest and smallest values of the variable:
 - 1. \$5.60 - \$6.50 per square foot of land or 90¢
 - 2. \$1970 - \$2208 per dwelling unit built or \$238
 - 3. \$3.72 - \$4.23 per square foot of gross building area or 51¢
 - 4. \$1226 - \$1327 per total number of rooms built or \$101
- F. Exhibit #3 shows the mean and the standard deviation of the mean.
- G. Quartile deviation must be applied to group data which are ranked from high to low. First the data is divided at the median and then each half of the data is split in half once again. Consider the net rentals of older supermarkets under existing leases provided in Exhibit #4.

Exhibit #4

CUMULATIVE FREQUENCY DISTRIBUTIONS Supermarket Net Rents for 214 Stores in Chain X

(1) New Rent per Square Foot	(2) Number in Class with Lower Limit Shown	(3) Number Earning Less	(4) Number Earning as Much or More
\$2.25	2	0	214
2.35	23	2	212
2.45	49	25	189
2.55	63	74	140
2.65	45	137	77
2.75	25	182	32
2.85	3	207	7
2.95	4	210	4
3.05	<u>0</u>	<u>214</u>	<u>0</u>
Total	214	1051	875

- H. In the full array of data, the value of Q_1 and Q_3 are found to be \$2.50 and \$2.70, meaning $1/4$ of the properties generate less than \$2.50 a square foot and $1/4$ exceed \$2.70 per square foot while the middle half fall between these values. The quartile deviation is then $(2.70 - 2.50)/2$ or 10¢, or stated another way the range of the second and third quartile is about 10¢ per square foot.
- II. When comparable sales have only one dimension, such as net leaseable area or number of rooms, a direct mean and some of the squares dispersion test is possible. However, usually it is necessary to consider a variety of factors and discover how price changes relative to the net differences of each property. Linear regression is one such method.
- A. Ratcliff in Chapters 6 and 7 demonstrates a point system which ranks properties and is then weighted by buyers priorities. The weighted points are then compared to unit price. This system may be too elaborate for houses but can be demonstrated on a variety of commercial properties.
- B. Consider the evaluation of vacant industrial land in Exhibits 5, 6, and 7.
1. Point system should be kept simple. 1-3-5 indicates below average, average, and above average.
 2. If the appraiser is capable of making more careful distinctions between comparable properties, he can use a ten point scale such as 0, 4, 6, 8, 10 for each item, being careful not to change scales.
 3. Many small judgments are better than large rough adjustments because of the theory of off-setting errors. Too big a range in scoring implies drastic differences between the worst and the best.

REAL ESTATE INVESTMENT STRATEGIES AND
SELECTION CRITERIA FOR THE 1980'S

University of Texas Center, Austin, Texas
Saturday, September 20, 1980

Presented by: Professor James A. Graaskamp
University of Wisconsin

- I. Any investment reflects a set of assumptions about the future, expressed or implied, as well as a set of personal values and attitudes of the investor.
 - A. There is little we know for sure about the general future so we attempt to position ourselves relative to the unknowable. Positioning may take several terminologies:
 1. Diversification and liquidity
 2. Systematic risk vs. industry risk (covariance strategies)
 3. Estate planning
 4. Maintaining holding power for external shocks
 - B. Investors or investment committees may establish policies or screens for managing risk
 1. Political exposure
 2. Degree of channeled demand
 3. Degree of management intensiveness
 4. Degree of equity capital exposure
 5. Cash flow enterprise characteristics
 6. Degree of leverage
 7. Degree of tax compatibility with portfolio
 8. Degree of fit to estate plan (individual)
 - C. Specific investment selection investigation
- II. Each investor should have attitudes about future trends, such as:
 - A. A gradually aging population with an increasing municipal employee pension liability distorting the real estate tax
 - B. The use of gasoline passenger autos, urban compression? multiple nuclei towns? rate of energy obsolescence on high-rise buildings?
 - C. How will rising food, energy, and housing costs and fewer children per family affect discretionary income sales at department stores? Goods vs. services vs. experiences
 - D. How will rising isolation of the U.S. affect the economy?

E. What about the lack of immigration policies to the U.S.?

Etc.

III. Investment preference screens

A. Political exposure

1. Direct land use or rent controls
2. Indirect controls on effective demand
3. Indirect subsidies of competitive supply
4. Vulnerability to political extortion

B. Degree of channeled demand

1. Source of monopoly position (site, permits, technology, timing, . . . , etc.)
2. Captive customer
3. Reciprocity
4. Competitive edge from merchandising research

C. Degree of management intensiveness

1. Term of leases and specialization of property
2. Cost of necessary expertise
3. Income stability correlated to a specific personality
4. Continuity vs. mortality of tenant management

D. Degree of equity capital exposure

1. Equity exposure while acquiring permits
2. Expected equity contribution to finished project
3. Holding power for cost overruns or revenue underruns
4. Personal liability

E. Cash flow enterprise characteristics

1. Fixed cost, variable revenue
2. Variable cost, fixed revenue
3. Dependency on specific returns on capital (operations, tax shelter, refinancing, capital gains, or sale of services)
4. Financial ratio analysis (break even, profit sensitivity, and ruin)

F. Degree of leverage

1. Selection of leverage measure (overall return vs. interest cost, before or after taxes, overall return vs. debt constant, tax leverage, portfolio leverage, etc.)
2. Indirect leverage in terms of economies of scale, assistance in public financing such as TIF or UDAG, etc.

G. Degree of tax compatibility with portfolio

1. Passive or business classification
2. Allowable leverage
3. Need for shelter
4. Need for tax credits
5. Need to salvage existing tax carry-forwards

H. Degree of fit to estate plan

1. Liquidity problems
2. Pressure for pass through of small business or farm opportunities
3. Divisibility for bequest purposes
4. Management continuity and specialized expertise
5. Structuring to achieve transfer of equity built up (Subchapter S versus corporation with two classes of stock)

OR Investment banking plans

1. Cash flow or taxable earnings growth curve
2. Conversion of submerged equity to book equity
3. Advantages of merger vs. purchase
4. Relationship of cash return on real estate investments vs. cost of capital

IV. Increasing investor competition for real estate

- A. Historically prudent men invested in stocks and bonds
- B. New recognition that diversification includes wide variety of media including real estate, precious metals, natural resources, research and development of new technologies, etc.
- C. Stocks and bonds are often argued to be an efficient market where expensive research and selection does not provide superior investment results
- D. Some writers have argued that real estate is attractive because it is bought and sold in a very inefficient market place, providing superior returns for those with careful selection, pricing, and timing expertise
- E. There may be several market levels and degrees of efficiency in real estate depending on minimum investment, cost of search, degree of personal involvement, and in-house skills
 - 1. Major foreign investors and domestic American funds want properties in excess of \$5 million in office, retail, industrial, or hotels (very efficient)
 - 2. Syndicators tend to prefer slightly smaller properties for retailing shares to slightly less knowledgeable buyers (efficient search, inefficient distribution costs)
 - 3. Local developer-broker agencies want projects as customers for their services rather than depositories for their capital
 - 4. Small investors seek to trade in small properties as in a camel bazaar
 - 5. Let's talk about investors in classes 3 and 4
- F. Research by the selected investor is intended to minimize risk and then maximize cash returns
 - 1. The basic philosophy of inquiry and search is risk management
 - 2. Risk management provides rationale for the financial ratios we seek
 - 3. In real estate, the risk is basically nonsystematic or can be made so for short periods of time
 - 4. Selection as well as diversification is critical

CONTEMPORARY REAL ESTATE FEASIBILITY ANALYSIS

For Presentation at
University of Alberta Extension
Edmonton, Alberta, Canada
October 12-13, 1978

Instructor: Professor James A. Graaskamp
University of Wisconsin School of Business

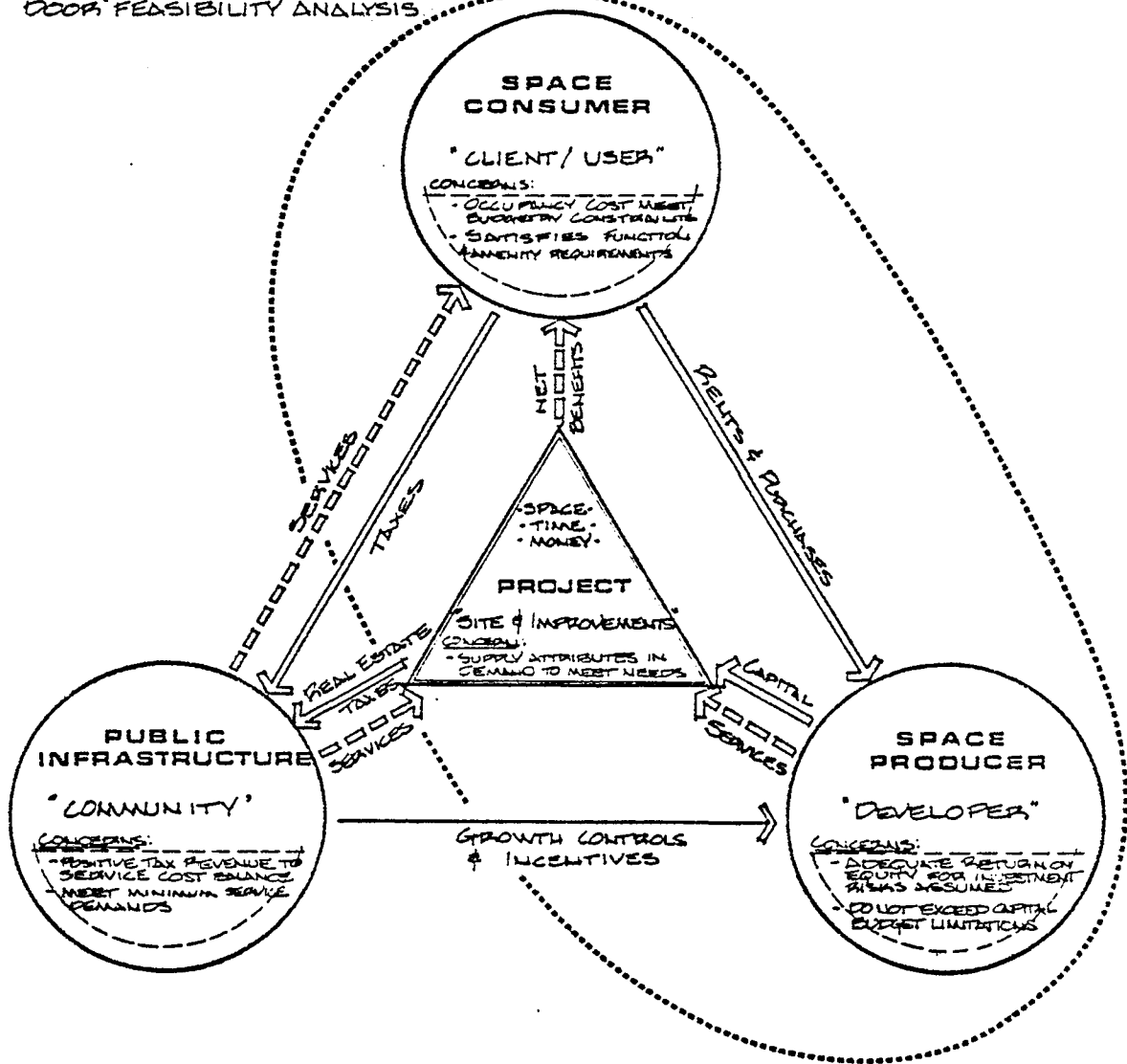
I. Basic Concepts and Definitions

- A. Real estate is a tangible product - defined as artificially delineated space with a fourth dimension of time referenced to a fixed point on the face of the earth.
 - 1. Real estate is a space-time unit, room per night, apartment per month, square foot per year, tennis court hours, or a condominium for two weeks in January at a ski slope.
 - 2. To the space-time abstraction can be added special attributes to house some form of activity.
 - 3. Improvements from survey market to city layouts to structures define space.
 - 4. Legal contracts and precedents define time.
 - 5. Rights of use are defined by public values, court opinions.
 - 6. Private rights to use are those which remain after the public has exercised its rights to control, to tax, or to condemn.
- B. A real estate project is a business enterprise which combines a space-time product with certain types of management services to meet the needs of a specific user. It is the process of converting space-time needs to money-time dimensions in a cash economy.
 - 1. A real estate business is any business which provides expertise necessary to relate space-time need to money-time requirements and includes architects, brokers, city planners, mortgage bankers, and all the other special skills.
 - 2. The true profit centers in real estate are in the delivery of services and cash capital.
 - 3. Since private property rights are only the residual rights after subtracting the public interest, the only real private property is money.
 - 4. Equity ownership is the degree to which one enterprise controls or diverts cash from another real estate enterprise.
- C. The real estate process is the dynamic interaction of three groups, space users (consumers), space producers, and the various public agencies (infrastructures) which provide services and capital to support the consumer needs. (See Exhibit 1)
 - 1. Each of these three decision groups represent an enterprise, an organized undertaking. All are cash cycle enterprises constrained by a need for cash solvency, both short and long term.
 - 2. A desirable real estate solution occurs when the process permits maximum satisfaction to the consumer at a price that he can afford within the environmental limits of land while permitting the consumer, producer, and the government cash cycle to achieve solvency - cash breakeven at a minimum, after full payment for services rendered.

3. Solvency of the total process, not value, is the critical issue.
 4. Land is an environmental constraint and not a profit center.
Land provides access to a real estate business opportunity and is not the opportunity itself. Real estate business wants to control land to create a captive market for services.
- D. The old concept of highest and best use - namely maximizing the wealth of an individual from the ownership of land in a stated period of time is being replaced with more socially responsive definitions. Here at Wisconsin we use two concepts, one representing the ideal solution and one representing the most practical current solution.
1. The most fitting use is that use which is the optimal reconciliation of effective consumer demand, the cost of production, and the fiscal and environmental impact on third parties.
 2. Reconciliation involves financial impact analysis on "who pays" and "who benefits" - thus the rash of debate on how to do impact studies.
 3. The most probable use will be something less than the most fitting use depending on topical constraints imposed by current political factors, the state of real estate technology, and short term solvency pressures on consumer, producer, or public agency.
- E. A real estate decision has only two basic forms. Either someone with a site with land and possibly improvements is seeking a use, a need, a consumer with the ability to pay (or) a consumer, need, or use with a defined ability to pay is seeking some combination of space-time attributes he can afford.
1. Feasibility is a non-financial concept of fitting a real estate solution and service package to a context of public priorities and customer needs. The project must fit the general customer needs. The project must fit the general market, a specific consumer group, the environmental limits of the land, the nature of existing usable improvements, legal and political controls imposed by the public, the need for compatibility with the total and natural man-made environment, and the limits of physical design construction. (See Exhibit 2)
 2. Real estate investment is "buying" a set of financial assumptions accepted and realizations achieved, between proforma estimates and profit and loss realized.
- II. Financial management is control of variance in the various assumptions which combine to define net outlays and receipts. The uncontrollable risk remains so there must be a tolerance for surprise in any financial plan. Yield on investment is simply the ratio of receipts to outlays over time and that is the simple part, the essential question is how reliable are the estimates of outlays and receipts, how sensitive are they to surprise.
- A. An investment in a bond can be defined as to when it begins in time, when it is sold, when coupons are collectable and total costs and total receipts under alternative outcomes. Thus, yield is easily computed and risk depends on whether you can rely on the promisor.

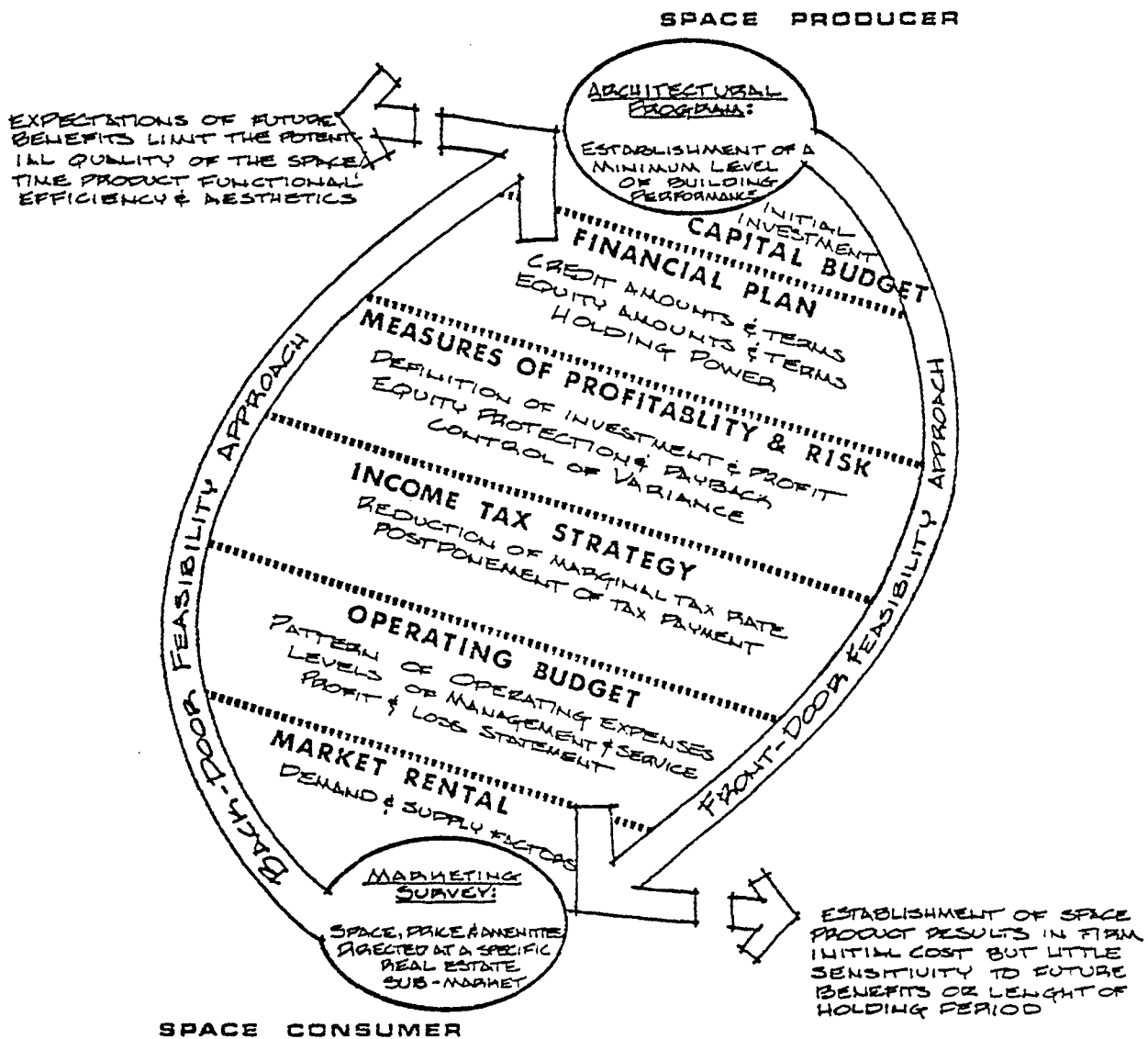
EXHIBIT I

DATA INPUT CONCENTRATION
FOR A "FRONT DOOR - BACK
DOOR" FEASIBILITY ANALYSIS



THE REAL ESTATE DEVELOPMENT SYSTEM

EXHIBIT 2



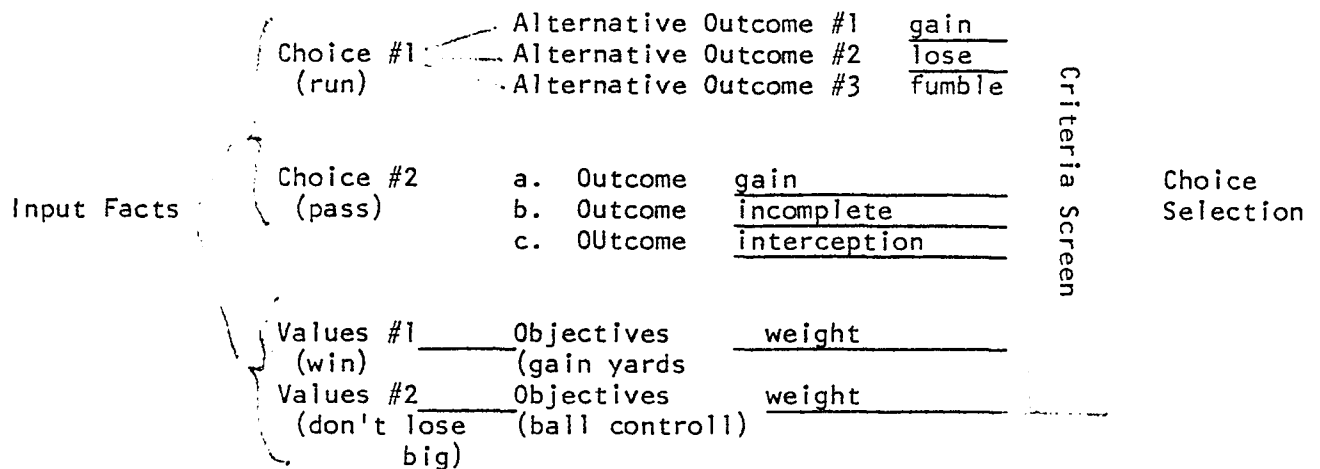
TWO SIDES OF THE COIN

1. Real estate financial analysis seldom enjoys such a rigid set of financial specifications and therefore seldom enjoys reasonable conditions of certainty.
 2. In place of rigid time tables and amounts, the real estate investor supplies many assumptions about the business future and its many alternative outcomes.
 3. To talk about risk and compare it between investments implies some explicit measures rather than simply subjective doubt--expressed by a shrug of the shoulders.
- B. Modern management defines risk as the potential variance between expectations and realizations, i.e., between proforma prospects and historical balance sheet and P & L statements.
1. Variance sometimes is a binary--yes-no question. You will or you won't receive zoning approval.
 2. Variance sometimes is the possible range around an average or a median--a distribution of alternative costs or revenue possibilities.
- C. For ease of analysis there are two kinds of risks:
1. Static risks (uncontrollable, or external events) are those which can only cause a loss due to surprise upset of a plan.
 2. Dynamic risks (partially controllable internal events) can produce profit or loss and are best controlled by the finesse of management execution of a plan.
- D. Risk evaluation or comparison grows out of the function of risk management for an enterprise.
1. Risk management has two objectives:
 - a. First priority - conservation of existing enterprise assets despite surprise events.
 - b. Second priority - realization of budgeted expectations despite surprise events.
 2. The process of risk management involves systematic and continuous:
 - a. Identification of significant exposures to loss
 - b. Estimation of potential loss frequency and severity
 - c. Identification of alternative methods to avoid loss
 - d. Selection of a risk management method
 - e. Monitoring execution of risk management plan
 3. The risk management process is both a philosophy of inquiry or analysis and a checklist of management concern, which is attempting to answer systematically 'WHAT IF...?' questions, to anticipate surprise and to provide for a response or adjustment in advance of the contingency.

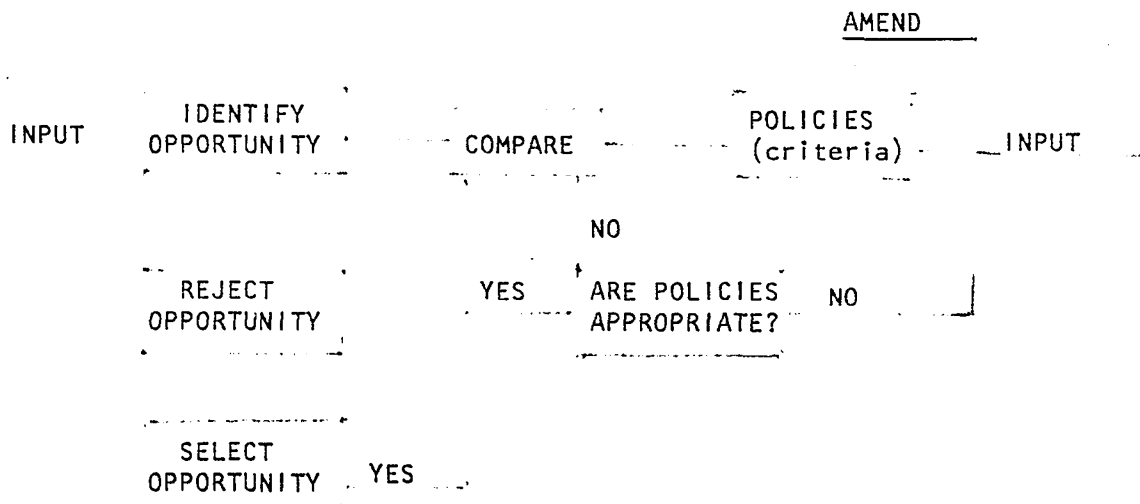
- E. Identification of significant exposures to loss can begin by using standard business documents as reminders, such as:
 - 1. Review of balance sheet accounts
 - 2. Review of profit and loss statement accounts
 - 3. Review of business organization or function chart
 - 4. Review of elements of financial feasibility analysis
- F. Significant has to do with potential loss frequency, loss severity, and degree of uncertainty.
 - 1. Very frequent and minor become expense accounts
 - 2. Less frequent but predictable and major become reserves or budget allowances.
 - 3. Infrequent, uncertain but very severe become issues of risk management.
 - 4. A 50/50 probability is the most uncertain outcome.
- G. The alternative methods of avoiding loss which everyone subconsciously uses include:
 - 1. Eliminate risk exposure
 - 2. Reduce frequency or severity of loss (diversification or mortgage loan closing process)
 - 3. Combine risks to increase predictability (reserves for expenses)
 - 4. Shift risk by contract (subcontracts or escalator clauses)
 - 5. Shift risk by combination (diversification) by contract (insurance)
 - 6. Limit maximum loss (corporate shell or limited partnership)
 - 7. Hedging (sale and leaseback, options, contingent sales)
- H. Selection of a risk management method depends on whether you are talking about a dynamic or static risk and the trade practices of a particular industry or business type.
 - 1. A mortgage is a risk management contract
 - 2. A lease is a risk management contract
 - 3. Any form of equity ownership is a trade-off between risk avoidance and degree of control desired of management or tax decisions.
 - 4. It should be noted that the principles are appropriate to any enterprise and not just real estate. Real estate education has been too quick to be inbred, to regard its problems as unique, rather than to relate to the evolution of management science in general.
 - 5. Risk management theory in the abstract simply represents a careful structuring of the common sense which you have successfully applied to your own business.

III. Financial decisions have the same form as any decision process. Alternative courses of action are identified, ranked in terms of their possible results, and then one course of action is selected and acted upon.

- A. Even Woody Hayes talks about alternative outcomes and their desirability, he might diagram his thinking on the blackboard as in Exhibit 3.

EXHIBIT 3

- B. The systems engineer might describe a decision with a simple flow chart as below in Exhibit 4.

EXHIBIT 4

- C. Real estate decision like many others are so complex and require such systematic and comprehensive analysis of many relationships among variables that it is useful to talk in terms of models.
1. Models may be physical representations of an airplane fuselage or site topography.
 2. Models may also be used to communicate complex relationships in simple ways which may be more relevant to the decision maker. A report format is a model.
 3. Models can be used to state mathematical relationships, such as the capture rate of a given project relative to total demand for lots, apartments, or sq. ft. of office space. This seminar is concerned with financial models.

- D. Any model has three basic requirements:
1. A careful statement of the question or decision
 2. Determination of available or obtainable data
 3. A statement (hypothesis) about the relationship of the data to the question
- E. Constraints on the use of models to answer any particular problem requirement and models should be judged in terms of how they meet these constraints:
1. What are the limitations of the analyst who intends to use the model? Does he understand the implications and can he do the analysis?
 2. 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.
 3. 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.
- F. Models are intended to describe alternative outcomes which can be ranked by some common denominators for their desirability, their vulnerability to surprise, and their efficiency in achieving objectives. Thus financial analysis is not interested in a specific number or set of numbers; rather it is interested in organizing facts quickly to represent alternative outcomes, to represent these outcomes in a form of ratios and comparative units which permit the investor to decide based on a firm set of criteria applied with judgment.
- G. Critiquing the form and adequacy of a real estate solution is analogous to the artistic concept of judging the success of an art object by relating form of the solution to the context to which it was created.
1. Context includes those elements which are fixed, given, or objectives and to which any solution must adapt.
 2. Form giving elements are those variables within the artists control, i.e., options or alternatives at a particular time.
 3. A solution is judged for its correctness or success in terms of the degree of fit of the form proposed to the context.
 4. Feasibility analysis is concerned with the degree of fit or the extent of misfit between a proposed course of action and the context within which it must operate or fit.
- H. 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 likelihood of satisfying explicit objectives when a selected course of action is tested for fit to a context of specific constraints and limited resources.

- I. The problem of defining objectives and measuring success depends almost entirely on correctly defining the problem and values of the client.

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. A check list of physical attributes
2. A check list of critical linkage attributes
3. A check list of dynamic behavioral attributes
4. A check list of attributes or services (given weighted point scores)
5. Financial ratios measuring risk, such as cash break-even, rate of capital recapture, loan ratios or sensitivity to specified contingencies
6. Probability distributions of alternative outcomes and standard error of the estimate
7. Psychological gratifications
8. Specified legal attributes
9. Measures of impact on environment

- J. The definition also implies uncertainty - a reasonable likelihood 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.

- K. The general theory of the management process for any enterprise can be converted to real estate semantics for feasibility:

Values, objectives, policy	Strategic format
Search for opportunity alternatives	Market trend analysis
Selection of an opportunity	Merchandising target with monopoly character
Program to capture opportunity	Legal-political constraints
	Ethical-aesthetic constraints
	Physical-technical constraints
	Financial constraints
Construction of program	Project development
Operation of program	Property management
Monitoring and feedback	Real estate research

- L. 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.

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

5. ~~Comptability studies of project to community planning, conservation standards, or other public policies.~~
6. ~~Engineering, land planning, and architectural studies.~~
7. ~~Financial studies: economic modeling, capital budgets, present value and discounted cash flow forecasts, rate of return analysis, financial packages.~~

IV. What is the Problem as Perceived by the Client?

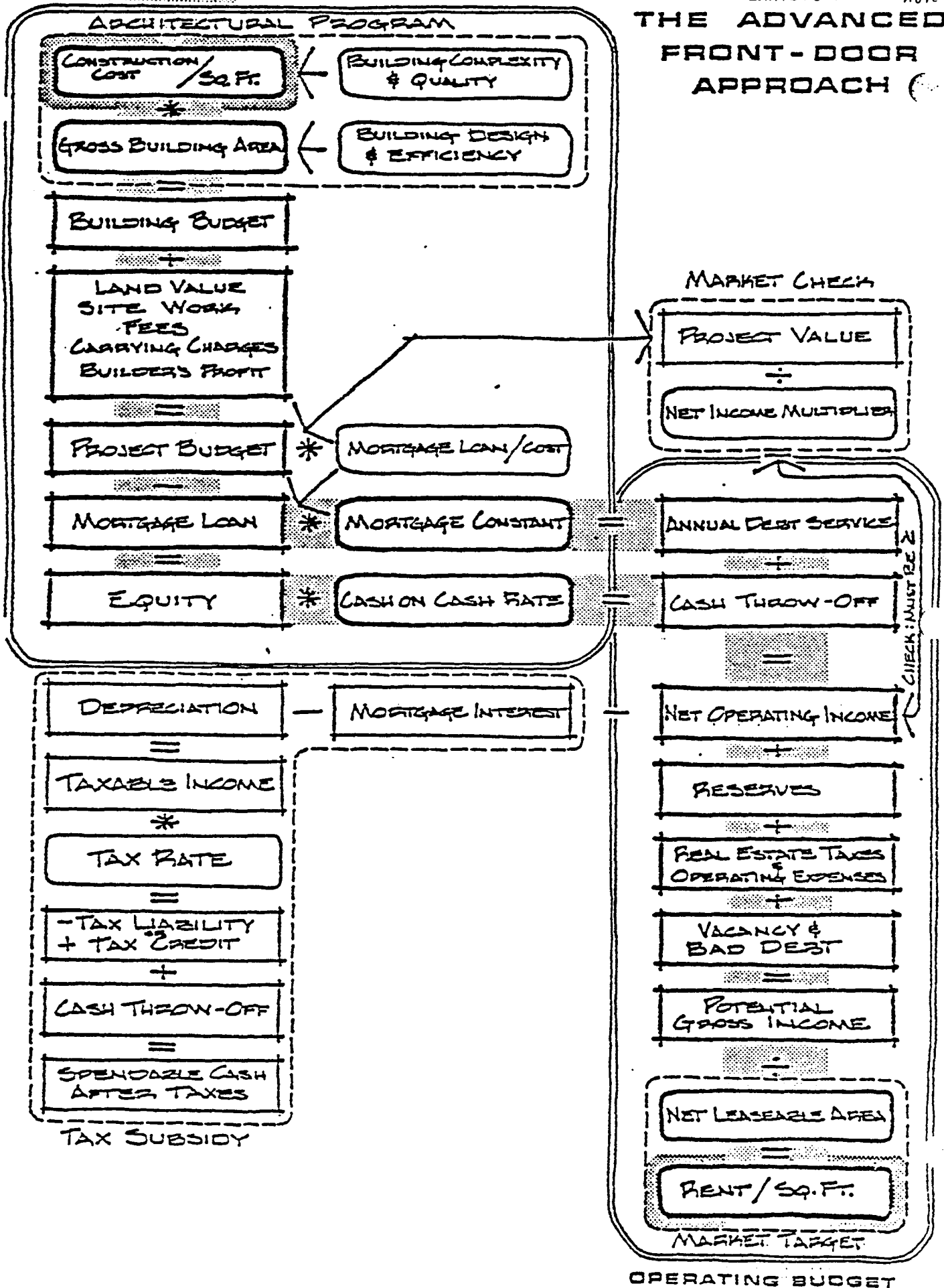
The original problem as perceived by the client is seldom the real issue of feasibility analysis that will need to be examined by the analyst.

- A. 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.
- B. 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 sub-contracting certain functions of others by the way in which he purchases services and supplies).
 1. Since everyone is an expert on real estate the client will probably presume that a certain procedure will be followed.
 2. 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.
 3. Almost every client will overlook some of the basic issues because of the natural bias of his position.
 4. The consultant must begin by attempting to discover what is taken for granted and that search will continue to condition his relationship ith his client.
- C. 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. His concept as to the "essence" of his business
 2. His preferred method of meeting entrepreneurial risk
 3. His preferred method of personnel compensation
 4. His style of value decision trade-offs between qualitative and quantitative issues.
 5. His perception of his risk position and his risk utility "curve."
 6. His personal non-business objective.
 7. 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).
- D. 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."

CAPITAL BUDGET

Exhibit 1

THE ADVANCED FRONT-DOOR APPROACH



CAPITAL BUDGET

Exhibit 1 (cont'd.)

ARCHITECTURAL PROGRAM

24.64

*

39,000

960,982

+

237,765

=

1,198,747

*

45 %

898,640

*

.113477

300,107

*

.075

36,037

-

85,371

=

3075

*

50%

=

-1537

+

22,508

=

20,971

TAX SUBSIDY

THE ADVANCED FRONT-DOOR APPROACH

MARKET CHECK

1,198,747

÷

9.6

101,975

+

22,508

=

124,483

+

0

+

72,345

+

10,359

=

207,187

÷

33,150

=

6.25

MARKET TARGET

OPERATING BUDGET

OPERATING BUDGET

MARKET SURVEY

RENT/SQ. FT.

MARKET RENT / SPACE UNIT

NET LEASEABLE AREA

TARGET CAPTURE RATE

RENTAL MARKET TOTAL SPACE UNIT DEMAND

POTENTIAL GROSS INCOME

DEFAULT POINT

TOTAL CASH OUTLAYS

OPERATING EXPENSES

CASH MARGIN

REAL ESTATE TAXES

VACANCY

RESERVES

CASH AVAILABLE FOR DEBT SERVICE

MORTGAGE CONSTANT

CASH ON CASH RATE

CASH THROW-OFF

PRINCIPAL REPAYMENT

DEPRECIATION

TAXABLE INCOME

TAX RATE

- TAX LIABILITY
+ TAX CREDIT

CASH THROW-OFF

SPENDABLE CASH
AFTER TAXES

THE ADVANCED BACK-DOOR APPROACH

MARKET CHECK

POTENTIAL GROSS INCOME

VACANCY, R.E. TAXES &
OPERATING EXPENSES

NET OPERATING INCOME

NET INCOME MULTIPLIER

MORTGAGE LOAN

EQUITY

TOTAL PROJECT VALUE

LAND VALUE
SITE WORK
FEES
CARRYING CHARGES
BUILDER'S PROFIT

BUILDING BUDGET

GROSS BUILDING AREA

CONSTRUCTION COST / SQ. FT.

ARCHITECTURAL PROGRAM

CAPITAL BUDGET

MARKET SURVEY

\$6.00

.50/FT./MO.

600 SQ. FT.

= \$300/MO. RENT

3600

* 80% DEFAULT POINT

2880

\$720 EXPENSES

720

520 REAL ESTATE TAXES

180

(5% VACANCY)

120

(RESERVES)

\$140 DEBT SERVICE

.096552

.08 CASH ON CASH

00683% 15 YR

9 1/2% 30 YR MORTGAGE

.096552

360

\$116

\$1200

\$724

.30

\$217 TAX SAVINGS TO OTHER INCOME

360 CASH THROWOFF

577 1/4,500 = 12.8% 15 YR

TAX SUBSIDY

THE ADVANCED BACK-DOOR APPROACH

MARKET CHECK

3600

\$1,420 VACANCY, TAXES, & EXPENSES

NO! = 2180

X10 = 21,800

\$16,985

4,500

\$21,485

\$2,000 (LAND)
1,948 (DEVELOPMENT FEE)
3,222 (INDIRECT AT 1.2%)
7,170

14,314

700 GROSS FEET PER UNIT

\$20.45/SQ. FT.

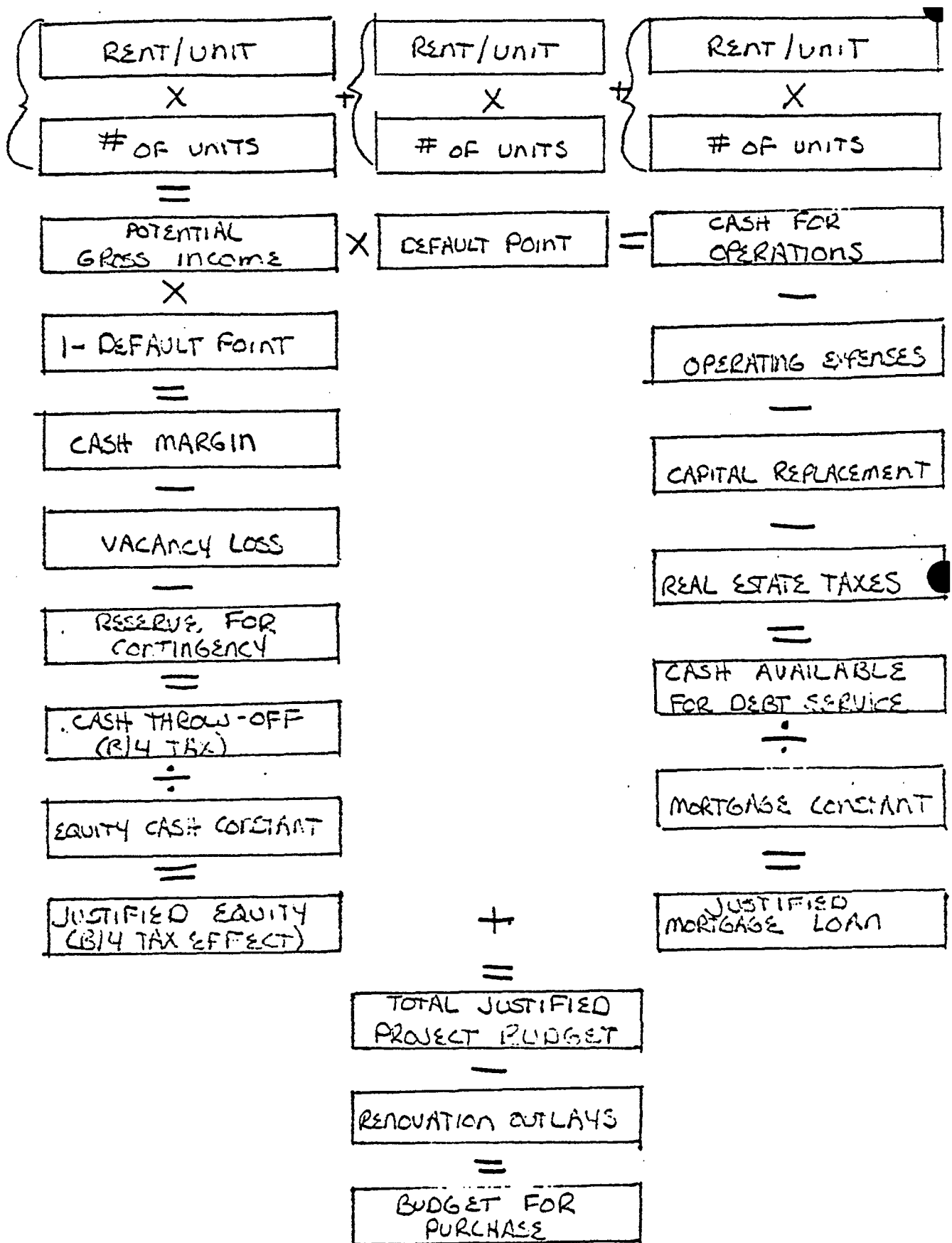
ARCHITECTURAL PROGRAM

CAPITAL BUDGET

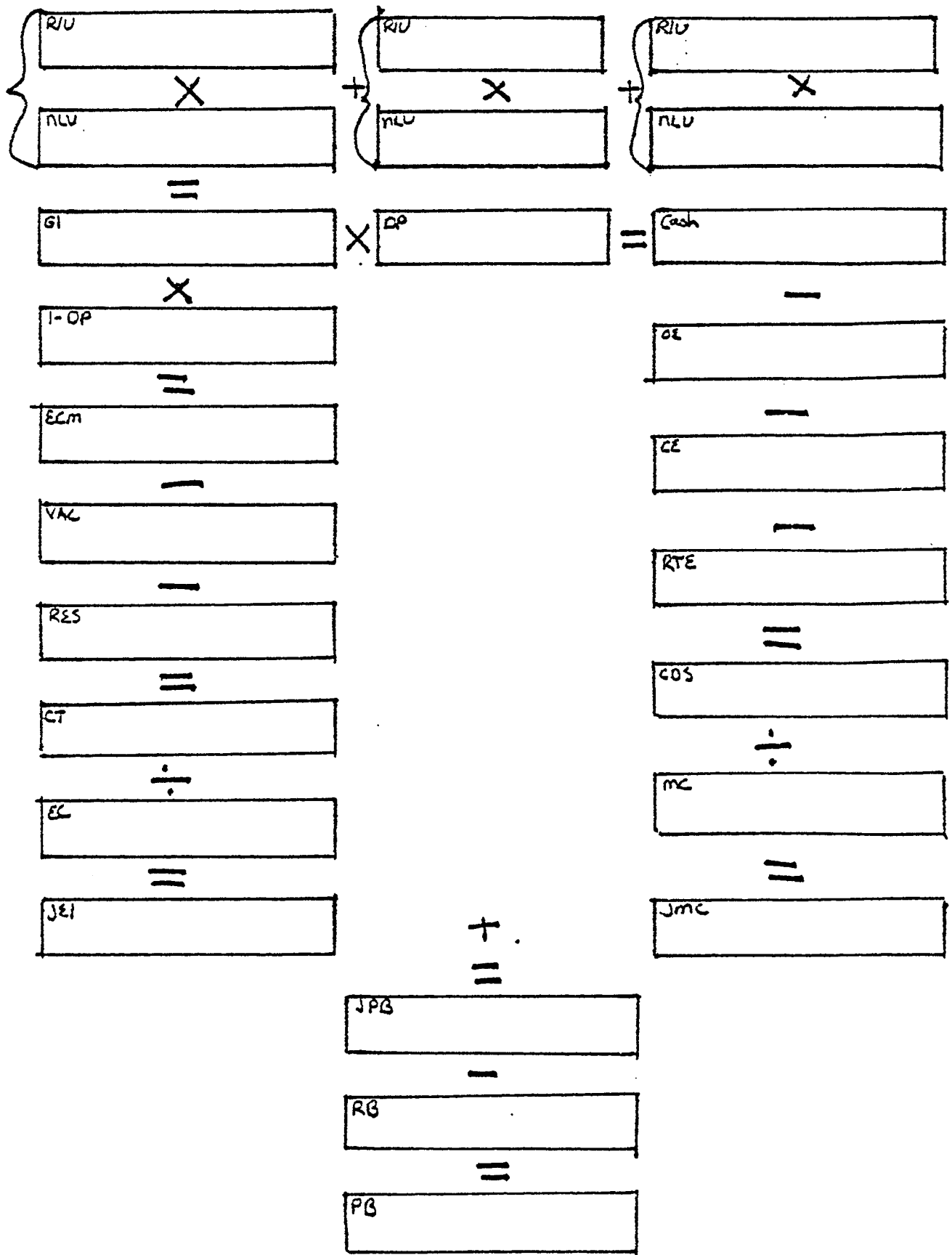
CHECK MUST BE 2

85% OFFIC

BACKDOOR APPROACH FORMAT
FOR RANKING MOST PROBABLE USE



BACKDOOR APPROACH FORMAT
FOR RANKING MOST PROBABLE USE



CASH FLOW PRO FORMA USING PARAMETER NORMS

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

DATE: 2/14/1977

BLDG: 1

RUN : 1

GROSS SQUARE FEET IN BUILDING: 700.
BUILDING EFFICIENCY : 85.0 PCT
NET LEASEABLE SQUARE FOOTAGE : 595.

LAND AND CONSTRUCTION COST : \$ 19500.
LOAN TO COST RATIO : 75.0 PCT
ORIGINAL LOAN AMOUNT : \$ 14625.

EQUITY REQUIREMENT : \$ 4875.

PERMANENT INTEREST RATE : 9.000 PCT
TERM OF LOAN 30. YEARS

ANNUAL DEBT SERVICE : \$ 1412.

ANNUAL DOLLARS

GROSS INCOME : 595. SQ FT AT \$ 6.00 3570.

LESS: VACANCY OF 5.00 PCT 179.

GROSS ADJUSTED INCOME 3392.

PLUS: PARKING INCOME 150.

PLUS: OTHER INCOME 24.

GROSS EFFECTIVE INCOME 3566.

LAND LEASE EXPENSE 100.

OPERATING EXPENSES: 595. SQ FT AT \$ 2.76 1642.

NET OPERATING INCOME 1823.

DEBT SERVICE (9.66 PCT CONSTANT) 1412.

PRO FORMA CASH FLOW 411.

RETURN ON EQUITY 8.43 PERCENT

DEBT SERVICE COVERAGE: 1.291

DEFAULT RATIO : 83.48 PERCENT

LOAN DATA FOR EACH SET OF FINANCIAL CONDITIONS

AMOUNT FINANCED \$ 14625. EQUITY \$ 4875.

LOAN RATIO 75.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE		
			ANNUAL	PER SQ FT	PER UNIT
9.000	30.0	9.6555	1412.	2.3733	
9.250	30.0	9.8721	1444.	2.4265	
9.500	30.0	10.0903	1476.	2.4802	
8.500	30.0	9.2270	1349.	2.2680	
8.000	30.0	8.8052	1288.	2.1643	

AMOUNT FINANCED \$ 15600. EQUITY \$ 3900.

LOAN RATIO 80.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE		
			ANNUAL	PER SQ FT	PER UNIT
9.000	30.0	9.6555	1506.	2.5315	
9.250	30.0	9.8721	1540.	2.5883	
9.500	30.0	10.0903	1574.	2.6455	
8.500	30.0	9.2270	1439.	2.4192	
8.000	30.0	8.8052	1374.	2.3086	

AMOUNT FINANCED \$ 16575. EQUITY \$ 2925.

LOAN RATIO 85.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE		
			ANNUAL	PER SQ FT	PER UNIT
9.000	30.0	9.6555	1600.	2.6897	
9.250	30.0	9.8721	1636.	2.7501	
9.500	30.0	10.0903	1672.	2.8109	
8.500	30.0	9.2270	1529.	2.5704	
8.000	30.0	8.8052	1459.	2.4529	

AMOUNT FINANCED \$ 17550. EQUITY \$ 1950.

LOAN RATIO 90.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE		
			ANNUAL	PER SQ FT	PER UNIT
9.000	30.0	9.6555	1695.	2.8480	
9.250	30.0	9.8721	1733.	2.9119	
9.500	30.0	10.0903	1771.	2.9762	
8.500	30.0	9.2270	1619.	2.7216	
8.000	30.0	8.8052	1545.	2.5972	

AMOUNT FINANCED \$ 18525. EQUITY \$ 975.

LOAN RATIO 95.00 PCT

INTEREST	TERM	CONSTANT	DEBT SERVICE		
			ANNUAL	PER SQ FT	PER UNIT
9.000	30.0	9.6555	1789.	3.0062	
9.250	30.0	9.8721	1829.	3.0736	
9.500	30.0	10.0903	1869.	3.1415	
8.500	30.0	9.2270	1709.	2.8728	
8.000	30.0	8.8052	1631.	2.7414	

PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS

PAGE 1 OF 12

SITE : 2000. SQUARE FEET
 BUILDING : 700. SQUARE FEET
 EFFICIENCY: 85.00 PCT(595. SQ FT)
 LOAN RATIO: 75.00 PCT OF \$ 19500.
 LOAN : \$ 14625.
 EQUITY : \$ 4875.
 FINANCING : 30. YEARS 9.000 PCT
 OTR INCOME: \$ 174. ANNUALLY
 EXPENSES : \$ 2.76 PER SQ FT
 LAND LEASE: \$ 100.

DATE 2-14-1977
 BLDG 1

RUN 1

ANNUAL CASH FLOWS

VACANCY ALLOWANCE

3.00 PCT	4.00 PCT	5.00 PCT	7.00 PCT	10.00 PCT
-----	-----	-----	-----	-----

RENTAL RATES
 ANNUAL \$/SQ FT

\$ 4.80	-210.	-239.	-267.	-324.	-410.
\$ 5.40	136.	104.	72.	8.	-89.
\$ 6.00	483.	447.	411.	340.	233.
\$ 6.60	829.	790.	750.	672.	554.
\$ 7.20	1175.	1132.	1089.	1004.	875.

BREAKEVEN RENTAL RATES

VACANCY ALLOWANCE

3.00 PCT	4.00 PCT	5.00 PCT	7.00 PCT	10.00 PCT
-----	-----	-----	-----	-----

RENTAL RATES
 ANNUAL \$/SQ FT

5.16	5.22	5.27	5.39	5.57
------	------	------	------	------

PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS		PAGE	2 OF 12
SITE :	2000. SQUARE FEET	DATE	2-14-1977
BUILDING :	700. SQUARE FEET	BLDG	1
EFFICIENCY:	85.00 PCT(595. SQ FT)		
LOAN RATIO:	75.00 PCT OF \$ 19500.		
LOAN :	\$ 14625.		
EQUITY :	\$ 4875.		
FINANCING :	30. YEARS 9.000 PCT		
VACANCY :	5.00 PCT OF LEASEABLE		
QTR INCOME:	\$ 174. ANNUALLY	RUN	1
LAND LEASE:	\$ 100.		

ANNUAL CASH FLOWS

ANNUAL EXPENSE RATES PER SQ FT

\$ 2.40	\$ 2.64	\$ 2.76	\$ 3.00	\$ 3.36
-----	-----	-----	-----	-----

RENTAL RATES ANNUAL \$/SQ FT

\$ 4.80	-53.	-196.	-267.	-410.	-624.
\$ 5.40	286.	143.	72.	-71.	-285.
\$ 6.00	625.	483.	411.	268.	54.
\$ 6.60	965.	822.	750.	608.	393.
\$ 7.20	1304.	1161.	1089.	947.	732.

BREAKEVEN RENTAL RATES

ANNUAL EXPENSE RATES PER SQ FT

\$ 2.40	\$ 2.64	\$ 2.76	\$ 3.00	\$ 3.36
-----	-----	-----	-----	-----

RENTAL RATES ANNUAL \$/SQ FT

4.89	5.15	5.27	5.53	5.90
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PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS

PAGE 3 OF 12

SITE :	2000. SQUARE FEET	DATE	2-14-1977
BUILDING :	700. SQUARE FEET	BLDG	1
EFFICIENCY:	85.00 PCT(595. SQ FT)		
LOAN RATIO:	75.00 PCT OF \$ 19500.		
LOAN :	\$ 14625.		
EQUITY :	\$ 4875.		
VACANCY :	5.00 PCT OF LEASEABLE		
GTR INCOME:	\$ 174. ANNUALLY	RUN	1
EXPENSES :	\$ 2.76 PER SQ FT		
LAND LEASE:	\$ 100.		

ANNUAL CASH FLOWS

FINANCING PARAMETERS

	30. YEARS	30. YEARS	30. YEARS	30. YEARS	30. YEA
		R			
	9.00 PCT	9.25 PCT	9.50 PCT	8.50 PCT	8.00 P
		C			

RENTAL RATES ANNUAL \$/SQ FT

\$ 4.80	-267.	-299.	-331.	-204.	-143.
\$ 5.40	72.	40.	8.	135.	196.
\$ 6.00	411.	380.	348.	474.	536.
\$ 6.60	750.	719.	687.	813.	875.
\$ 7.20	1089.	1058.	1026.	1152.	1214.

BREAKEVEN RENTAL RATES

FINANCING PARAMETERS

	30. YEARS	30. YEARS	30. YEARS	30. YEARS	30. YEA
		R			
	9.00 PCT	9.25 PCT	9.50 PCT	8.50 PCT	8.00 P
		C			

RENTAL RATES ANNUAL \$/SQ FT

5.27	5.33	5.39	5.16	5.05
------	------	------	------	------

PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS

PAGE 4 OF 12

SITE :	2000. SQUARE FEET	DATE	2-14-1977
BUILDING :	700. SQUARE FEET	BLDG	1
LOAN RATIO:	75.00 PCT OF \$ 19500.		
LOAN :	\$ 14625.		
EQUITY :	\$ 4875.		
FINANCING :	30. YEARS 9.000 PCT		
VACANCY :	5.00 PCT OF LEASEABLE		
GTR INCOME:	\$ 174. ANNUALLY	RUN	1
EXPENSES :	\$ 2.76 PER SQ FT		
LAND LEASE:	\$ 100.		

ANNUAL CASH FLOWS

BUILDING EFFICIENCY (PCT OF GROSS)

75.00 PCT 78.00 PCT 80.00 PCT 82.00 PCT 85.00 PCT
LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

RENTAL RATES ANNUAL \$/SQ FT

\$ 4.80	-393.	-355.	-330.	-305.	-267.
\$ 5.40	-94.	-44.	-11.	22.	72.
\$ 6.00	205.	267.	308.	349.	411.
\$ 6.60	505.	578.	627.	677.	750.
\$ 7.20	804.	890.	947.	1004.	1089.

BREAKEVEN RENTAL RATES

BUILDING EFFICIENCY (PCT OF GROSS)

75.00 PCT 78.00 PCT 80.00 PCT 82.00 PCT 85.00 PCT
LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

RENTAL RATES ANNUAL \$/SQ FT

5.59	5.49	5.42	5.36	5.27
------	------	------	------	------

PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS	PAGE	5 OF 12
SITE : 2000. SQUARE FEET	DATE	2-14-1977
BUILDING : 700. SQUARE FEET	BLDG	1
EFFICIENCY: 85.00 PCT(595. SQ FT)		
FINANCING : 30. YEARS 9.000 PCT		
VACANCY : 5.00 PCT OF LEASEABLE		
GTR INCOME: \$ 174. ANNUALLY	RUN	1
EXPENSES : \$ 2.76 PER SQ FT		
LAND LEASE: \$ 100.		

ANNUAL CASH FLOWS

LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

RENTAL RATES
ANNUAL \$/SQ FT

\$ 4.80	-267.	-361.	-455.	-550.	-644.
\$ 5.40	72.	-22.	-116.	-210.	-305.
\$ 6.00	411.	317.	223.	129.	35.
\$ 6.60	750.	656.	562.	468.	374.
\$ 7.20	1089.	995.	901.	807.	713.

BREAKEVEN RENTAL RATES

LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

RENTAL RATES
ANNUAL \$/SQ FT

5.27	5.44	5.61	5.77	5.94
------	------	------	------	------

PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS	PAGE	6 OF 12
SITE : 2000. SQUARE FEET	DATE	2-14-1977
BUILDING : 700. SQUARE FEET	BLDG	1
EFFICIENCY: 85.00 PCT(595. SQ FT)		
LOAN RATIO: 75.00 PCT OF \$ 19500.		
LOAN : \$ 14625.		
EQUITY : \$ 4875.		
FINANCING : 30. YEARS 9.000 PCT		
REVENUE : \$ 6.00 PER SQ FT		
QTR INCOME: \$ 174. ANNUALLY	RUN	1
LAND LEASE: \$ 100.		

ANNUAL CASH FLOWS

ANNUAL EXPENSE RATES PER SQ FT

\$ 2.40	\$ 2.64	\$ 2.76	\$ 3.00	\$ 3.36
-----	-----	-----	-----	-----

VACANCY RATES

3.00 PCT	697.	554.	483.	340.	126.
4.00 PCT	661.	518.	447.	304.	90.
5.00 PCT	625.	483.	411.	268.	54.
7.00 PCT	554.	411.	340.	197.	-17.
10.00 PCT	447.	304.	233.	90.	-124.

BREAKEVEN RENTAL RATES

ANNUAL EXPENSE RATES PER SQ FT

\$ 2.40	\$ 2.64	\$ 2.76	\$ 3.00	\$ 3.36
-----	-----	-----	-----	-----

VACANCY RATES

3.00 PCT	4.79	5.04	5.16	5.41	5.78
4.00 PCT	4.84	5.09	5.22	5.47	5.84
5.00 PCT	4.89	5.15	5.27	5.53	5.90
7.00 PCT	5.00	5.26	5.39	5.64	6.03
10.00 PCT	5.17	5.43	5.57	5.83	6.23

PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS

SITE : 2000. SQUARE FEET
 BUILDING : 700. SQUARE FEET
 EFFICIENCY: 85.00 PCT(595. SQ FT)
 LOAN RATIO: 75.00 PCT OF \$ 19500.
 LOAN : \$ 14625.
 EQUITY : \$ 4875.
 REVENUE : \$ 6.00 PER SQ FT
 QTR INCOME: \$ 174. ANNUALLY
 EXPENSES : \$ 2.76 PER SQ FT
 LAND LEASE: \$ 100.

PAGE 7 OF 12

DATE 2-14-1977
 BLDG 1

RUN 1

ANNUAL CASH FLOWS

FINANCING PARAMETERS

S
 T
 30. YEARS 30. YEARS 30. YEARS 30. YEARS 30. YEA
 R
 9.00 PCT 9.25 PCT 9.50 PCT 8.50 PCT 8.00 P
 C

VACANCY RATES

3.00 PCT	483.	451.	419.	545.	607.
4.00 PCT	447.	415.	383.	510.	571.
5.00 PCT	411.	380.	348.	474.	536.
7.00 PCT	340.	308.	276.	402.	464.
10.00 PCT	233.	201.	169.	295.	357.

BREAKEVEN RENTAL RATES

FINANCING PARAMETERS

S
 T
 30. YEARS 30. YEARS 30. YEARS 30. YEARS 30. YEA
 R
 9.00 PCT 9.25 PCT 9.50 PCT 8.50 PCT 8.00 P
 C

VACANCY RATES

3.00 PCT	5.16	5.22	5.27	5.06	4.95
4.00 PCT	5.22	5.27	5.33	5.11	5.00
5.00 PCT	5.27	5.33	5.39	5.16	5.05
7.00 PCT	5.39	5.44	5.50	5.27	5.16
10.00 PCT	5.57	5.62	5.68	5.45	5.33

PR0 FORMA CASH FLOW TABLE

SENSITIVITY APT. DEM0

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS

PAGE 8 OF 12

SITE :	2000. SQUARE FEET	DATE	2-14-1977
BUILDING :	700. SQUARE FEET	BLDG	1
LOAN RATIO:	75.00 PCT OF \$ 19500.		
LOAN :	\$ 14625.		
EQUITY :	\$ 4875.		
FINANCING :	30. YEARS 9.000 PCT		
REVENUE :	\$ 6.00 PER SQ FT		
VACANCY :	5.00 PCT OF LEASEABLE		
QTR INCOME:	\$ 174. ANNUALLY	RUN	1
LAND LEASE:	\$ 100.		

ANNUAL CASH FLOWS

BUILDING EFFICIENCY (PCT OF GROSS)

75.00 PCT 78.00 PCT 80.00 PCT 82.00 PCT 85.00 PCT
LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

EXPENSE RATES ANNUAL \$/SQ FT

\$ 2.40	394.	464.	510.	556.	625.
\$ 2.64	268.	333.	375.	418.	483.
\$ 2.76	205.	267.	308.	349.	411.
\$ 3.00	79.	136.	174.	212.	268.
\$ 3.36	-110.	-60.	-28.	5.	54.

BREAKEVEN RENTAL RATES

BUILDING EFFICIENCY (PCT OF GROSS)

75.00 PCT 78.00 PCT 80.00 PCT 82.00 PCT 85.00 PCT
LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

EXPENSE RATES ANNUAL \$/SQ FT

\$ 2.40	5.21	5.11	5.04	4.98	4.89
\$ 2.64	5.46	5.36	5.29	5.23	5.15
\$ 2.76	5.59	5.49	5.42	5.36	5.27
\$ 3.00	5.84	5.74	5.67	5.61	5.53
\$ 3.36	6.22	6.12	6.05	5.99	5.90

PRO FORMA CASH FLOW TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS

PAGE 9 OF 12

SITE :	2000. SQUARE FEET	DATE	2-14-1977
BUILDING :	700. SQUARE FEET	BLDG	1
LOAN RATIO:	75.00 PCT OF \$ 19500.		
LOAN :	\$ 14625.		
EQUITY :	\$ 4875.		
REVENUE :	\$ 6.00 PER SQ FT		
VACANCY :	5.00 PCT OF LEASEABLE		
GTR INCOME:	\$ 174. ANNUALLY	RUN	1
EXPENSES :	\$ 2.76 PER SQ FT		
LAND LEASE:	\$ 100.		

ANNUAL CASH FLOWS

BUILDING EFFICIENCY (PCT OF GROSS)

75.00 PCT 78.00 PCT 80.00 PCT 82.00 PCT 85.00 PCT
LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

FINANCING

30.YR	9.00PCT	205.	267.	308.	349.	411.
30.YR	9.25PCT	174.	235.	277.	318.	380.
30.YR	9.50PCT	142.	204.	245.	286.	348.
30.YR	8.50PCT	268.	330.	371.	412.	474.
30.YR	8.00PCT	330.	391.	433.	474.	536.

BREAKEVEN RENTAL RATES

BUILDING EFFICIENCY (PCT OF GROSS)

75.00 PCT 78.00 PCT 80.00 PCT 82.00 PCT 85.00 PCT
LOAN TO COST RATIO

75.00 PCT 80.00 PCT 85.00 PCT 90.00 PCT 95.00 PCT

FINANCING

30.YR	9.00 PCT	5.59	5.49	5.42	5.36	5.27
30.YR	9.25 PCT	5.65	5.55	5.48	5.42	5.33
30.YR	9.50 PCT	5.72	5.61	5.54	5.48	5.39
30.YR	8.50 PCT	5.46	5.36	5.30	5.24	5.16
30.YR	8.00 PCT	5.34	5.25	5.19	5.13	5.05

PRØ FØRMA CASH FLØW TABLE

SENSITIVITY APT. DEMØ

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS		PAGE	10 OF 12
SITE :	2000. SQUARE FEET	DATE	2-14-1977
BUILDING :	700. SQUARE FEET	BLDG	1
EFFICIENCY:	85.00 PCT(595. SQ FT)		
LØAN RATIO:	75.00 PCT ØF \$ 19500.		
LØAN :	\$ 14625.		
EQUITY :	\$ 4875.		
FINANCING :	30. YEARS 9.000 PCT		
VACANCY :	5.00 PCT ØF LEASEABLE		
ØTR INCOME:	\$ 174. ANNUALLY	RUN	1
EXPENSES :	\$ 2.76 PER SQ FT		

ANNUAL CASH FLØWS

LAND LEASE CØST

\$	100.	\$	150.	\$	200.	\$	250.	\$	300.

RENTAL RATES
ANNUAL \$/SQ FT

\$	4.80	-267.	-317.	-367.	-417.	-467.
\$	5.40	72.	22.	-28.	-78.	-128.
\$	6.00	411.	361.	311.	261.	211.
\$	6.60	750.	700.	650.	600.	550.
\$	7.20	1089.	1039.	989.	939.	889.

BREAKEVEN RENTAL RATES

LAND LEASE CØST

\$	100.	\$	150.	\$	200.	\$	250.	\$	300.

RENTAL RATES
ANNUAL \$/SQ FT

5.27	5.36	5.45	5.54	5.63
------	------	------	------	------

PRØ FØRMA CASH FLOW TABLE

SENSITIVITY APT. DEMØ

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS

PAGE 11 OF 12

SITE :	2000. SQUARE FEET	DATE	2-14-1977
BUILDING :	700. SQUARE FEET	BLDG	1
EFFICIENCY:	85.00 PCT(595. SQ FT)		
LOAN RATIO:	75.00 PCT ØF \$ 19500.		
LOAN :	\$ 14625.		
EQUITY :	\$ 4875.		
FINANCING :	30. YEARS 9.000 PCT		
REVENUE :	\$ 6.00 PER SQ FT		
VACANCY :	5.00 PCT ØF LEASEABLE		
ØTR INCOME:	\$ 174. ANNUALLY	RUN	1

ANNUAL CASH FLOWS

LAND LEASE COST

\$ 100.	\$ 150.	\$ 200.	\$ 250.	\$ 300.
-----	-----	-----	-----	-----

EXPENSE RATES ANNUAL \$/SQ FT

\$ 2.40	625.	575.	525.	475.	425.
\$ 2.64	483.	433.	383.	333.	283.
\$ 2.76	411.	361.	311.	261.	211.
\$ 3.00	268.	218.	168.	118.	68.
\$ 3.36	54.	4.	-46.	-96.	-146.

BREAKEVEN RENTAL RATES

LAND LEASE COST

\$ 100.	\$ 150.	\$ 200.	\$ 250.	\$ 300.
-----	-----	-----	-----	-----

EXPENSE RATES ANNUAL \$/SQ FT

\$ 2.40	4.89	4.98	5.07	5.16	5.25
\$ 2.64	5.15	5.23	5.32	5.41	5.50
\$ 2.76	5.27	5.36	5.45	5.54	5.63
\$ 3.00	5.53	5.61	5.70	5.79	5.88
\$ 3.36	5.90	5.99	6.08	6.17	6.26

SENSITIVITY TABLE

SENSITIVITY APT. DEMO

U. W. REAL ESTATE DEPT.

FIXED PARAMETERS	PAGE	12 OF 12
SITE : 2000. SQUARE FEET	DATE	2-14-1977
BUILDING : 700. SQUARE FEET	BLDG	1
EFFICIENCY: 85.00 PCT OF GROSS		
LOAN RATIO: 75.00 PCT OF \$ 19500.		
EQUITY : \$ 4875.		
FINANCING : 30. YEARS 9.000 PCT		
REVENUE : \$ 6.00 PER SQ FT		
VACANCY : 5.00 PCT OF LEASEABLE		
PARK/OTHER: \$ 174. ANNUALLY	RUN	1
EXPENSES : \$ 2.76 PER SQ FT		
LAND LEASE: \$ 100. ANNUALLY		
CONSTRUCTION AND LAND COST 19500.		

EFFECT OF SELECTED CHANGES IN PARAMETERS	
PARAMETER CHANGE	INCREASE IN CASH FLOW
INCREASE BUILDING EFFICIENCY 1 PCT	21.
INCREASE RENTAL RATE \$.10 PER SQ FT	57.
DECREASE VACANCY RATE 1PCT	36.
DECREASE OPERATING RATE \$.10 PER SQ FT	60.
DECREASE PERMANENT RATE .25PCT	31.
DECREASE PERMANENT LOAN TERM BY 1 YEAR	-10.
DECREASE PERMANENT LOAN TERM BY 5 YEARS	-61.
DECREASE THE LOAN RATIO BY 5 PERCENT	94.
DECREASE LAND LEASE BY 10% 100.	

EQUIVALENT EFFECT TO YIELD A \$ 100. INCREASE IN ANNUAL CASH FLOW

INCREASE BUILDING EFFICIENCY BY	4.86 PCT
INCREASE RENT RATE BY \$	0.18 PER SQ FT
DECREASE VACANCY BY	2.80 PCT
DECREASE EXPENSE RATE BY \$	0.17 PER SQ FT
DECREASE PERMANENT RATE BY	0.79 PCT
INCREASE PERMANENT LOAN TERM BY	8.2 YEARS
DECREASE LOAN RATIO BY	5.3 PERCENT
DECREASE LAND LEASE BY \$	100.

1.	MRCAP BACKDOOR DEMO		* MICHAEL ROBBINS *	
	Project Title		User Name	
10.	1977	0	.85	1000
	Starting Year	Data Sets	Default Ratio	Cash-On-§
20.	1	2	.85	.09
	Back-Door	Back-Door Loans	Investment Default	D/4 Tax
30.	1	1.0	10	
	Classification	% Owned Year 1	Holding Period(1-25)	
40.	229600	.04	*	
	Fixed Income	2	3	4
41.	6	7	8	9
	11	12	13	14
42.	11	12	13	14
	16	17	18	19
43.	16	17	18	19
	21	22	23	24
44.	21	22	23	24
	11900	.05	*	
50.	11900	.05	*	
	Variable Income	2	3	4
51.	6	7	8	9
	11	12	13	14
52.	11	12	13	14
	16	17	18	19
53.	16	17	18	19
	21	22	23	24
54.	21	22	23	24
	.05	*		
60.	.05	*		
	Vacancy Rate	2	3	4
61.	6	7	8	9
	11	12	13	14
62.	11	12	13	14
	16	17	18	19
63.	16	17	18	19
	21	22	23	24
64.	21	22	23	24

70.	<u>.22</u> Real Estate Tax	<u>.05</u> 2	<u>*</u> 3	<u>4</u>	<u>5</u>
71.	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
72.	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
73.	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
74.	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>
80.	<u>.20</u> Fixed Expenses	<u>.055</u> 2	<u>*</u> 3	<u>4</u>	<u>5</u>
81.	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
82.	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
83.	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
84.	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>
90.	<u>Variable Expenses</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
91.	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
92.	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
93.	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
94.	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>
100.	<u>.13</u> Discount Rate	<u>.50</u> Income Tax Rate	<u>.05</u> Reinvestment Rate		
101.	<u>1000</u> Extraordinary Exp.	<u>.02</u> Project Growth Rate	<u>6</u> Project Growth Type		
102.	<u>.12</u> Working Capital Loan	<u>1</u> Ownership	<u>.065</u> Resale Cost Rate		
103.	<u>5000</u> Reserves Withheld	<u>7000</u> Equity Reserves	<u>.025</u> Equity Reserve Rate	<u>25000</u> Reserve Maximum	

PARTNERSHIPS

110. 1. Real Estate Dynamics
Title (20 character maximum)

111. 1. 1.0 .15 .10
Income Tax % of Spendable % Equity Contribution

112. 1. .0 .10 .10 .10
% Equity Reserve % Tax Loss % Tax Payment Discount Rate

113. 1. .05 .0 0
Reinvestment Rate % Mortgage Liability General Partner

110. 2. Jack Jones
Title

111. 2. .50 .30 .40
Income Tax % of Spendable % Equity Contribution

112. 2. .50 .40 .40 .13
% Equity Reserve % Tax Loss % Tax Payment Discount Rate

113. 2. .06 .0 0
Reinvestment Rate % Mortgage Liability General Partner

110. 3. Lean - 2 Homes
Title

111. 3. 2.0 .55 .50
Income Tax % of Spendable % Equity Contribution

112. 3. .50 .50 .50 .14
% Equity Reserve % Tax Loss % Tax Payment Discount Rate

113. 3. .07 .0 1
Reinvestment Rate % Mortgage Liability General Partner

110. 4. _____
Title

111. 4. _____
Income Tax % of Spendable % Equity Contribution

112. 4. _____
% Equity Reserve % Tax Loss % Tax Payment Discount Rate

113. 4. _____
Reinvestment Rate % Mortgage Liability General Partner

110. 5. _____
Title

111. 5. _____
Income Tax % of Spendable % Equity Contribution

112. 5. _____
% Equity Reserve % Tax Loss % Tax Payment Discount Rate

113. 5. _____
Reinvestment Rate % Mortgage Liability General Partner

110. 6. _____
Title

111. 6. _____
Income Tax % of Spendable % Equity Contribution

112. 6. _____
% Equity Reserve % Tax Loss % Tax Payment Discount Rate

113. 6. _____
Reinvestment Rate % Mortgage Liability General Partner

COMPONENT ENTRIES

200.	1.	Land	Title (20 character maximum)	
201.	1.	.13	.0	0
		Original Cost	% Depreciable	Depreciation Method
202.	1.	1	0	0
		Starting Year	Useful Life	Switching
200.	2.	Building	Title	
201.	2.	.87	1.0	5
		Original Cost	% Depreciable	Depreciation Method
202.	2.	1	33	0
		Starting Year	Useful Life	Switching
200.	3.	Parking	Title	
201.	3.	8000	.50	5
		Original Cost	% Depreciable	Depreciation Method
202.	3.	1	7	0
		Starting Year	Useful Life	Switching
200.	4.	Furnishings	Title	
201.	4.	15000	.85	5
		Original Cost	% Depreciable	Depreciation Method
202.	4.	1	10	0
		Starting Year	Useful Life	Switching
200.	5.		Title	
201.	5.			
		Original Cost	% Depreciable	Depreciation Method
202.	5.			
		Starting Year	Useful Life	Switching
200.	6.		Title	
201.	6.			
		Original Cost	% Depreciable	Depreciation Method
202.	6.			
		Starting Year	Useful Life	Switching
200.	7.		Title	
201.	7.			
		Original Cost	% Depreciable	Depreciation Method
202.	7.			
		Starting Year	Useful Life	Switching
200.	8.		Title	
201.	8.			
		Original Cost	% Depreciable	Depreciation Method
202.	8.			
		Starting Year	Useful Life	Switching

MORTGAGE ENTRIES

300.	1.	<u>Permanent Mortgage</u>			
		Title (20 character maximum)			
301.	1.	<u>.75</u>	<u>.095</u>	<u>0</u>	<u>27</u>
		Principal Amount	Annual Interest	Payment Period	Term
302.	1.	<u>12</u>	<u>1</u>	<u>3</u>	<u>3</u>
		Payments/Year	Year Began	Year End	Refinanced by *
303.	1.				
		Bonus Interest	Base Amount	Base Type	Mortgage Factor
300.	2.	<u>Land Contract</u>			
		Title			
301.	2.	<u>.13</u>	<u>.08</u>	<u>0</u>	<u>7</u>
		Principal Amount	Annual Interest	Payment Period	Term
302.	2.	<u>1</u>	<u>1</u>	<u>3</u>	<u>3</u>
		Payments/Year	Year Began	Year End	Refinanced by *
303.	2.				
		Bonus Interest	Base Amount	Base Type	Mortgage Factor
300.	3.	<u>Refinance Mortgage</u>			
		Title			
301.	3.	<u>.85</u>	<u>.09</u>	<u>0</u>	<u>25</u>
		Principal Amount	Annual Interest	Payment Period	Term
302.	3.	<u>4</u>	<u>4</u>	<u>29</u>	<u>0</u>
		Payments/Year	Year Began	Year End	Refinanced by *
303.	3.	<u>.035</u>	<u>130000</u>	<u>5</u>	
		Bonus Interest	Base Amount	Base Type	Mortgage Factor
300.	4.				
		Title			
301.	4.				
		Principal Amount	Annual Interest	Payment Period	Term
302.	4.				
		Payments/Year	Year Began	Year End	Refinanced by *
303.	4.				
		Bonus Interest	Base Amount	Base Type	Mortgage Factor
300.	5.				
		Title			
301.	5.				
		Principal Amount	Annual Interest	Payment Period	Term
302.	5.				
		Payments/Year	Year Began	Year End	Refinanced by *
303.	5.				
		Bonus Interest	Base Amount	Base Type	Mortgage Factor
300.	6.				
		Title			
301.	6.				
		Principal Amount	Annual Interest	Payment Period	Term
302.	6.				
		Payments/Year	Year Began	Year End	Refinanced by *
303.	6.				
		Bonus Interest	Base Amount	Base Type	Mortgage Factor

OUTPUT OPTIONS (Enter "0" to suppress report printing; Enter "1" to permit report printing)

400 5 , , , , , , , , ,
1 2 3 4 5 6 7 8 9 10

Report Field Identifiers

<u>Field #</u>	<u>Report Title</u>	<u>Field #</u>	<u>Report Title</u>
1.	Summary of Income & Expense	6.	After Tax Ratios
2.	Component Summary	7.	Modified Internal Rate of Return
3.	Cash Flow	8.	Mortgage Amortization
4.	Market Value	9.	Depreciation Schedules
5.	Before Tax Ratios	10.	Partnership Report

* = Position #1 of Card 400

5* = Auto 1, 2, 3, 4, 5, 6, 7, 10

9* = Auto All

3* = Select Specific Line #'s (10 maximum)

GRAPHIC OUTPUT (Enter output line I.D. numbers 1-48, in any order)

401 5 , 18 , 23 , 48 , 36

402 37 , 40 , 45 , 46 , 47

PRINT YEARS (Enter any year number 1-25, in any order)

403 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , ,

404 , , , , , , , , ,

405 , , , ,

P R J F J R M A
INVESTMENT ANALYSIS OF

MRCAP BACKDOOR DEMO

FOR

* MICHAEL ROBBINS *

* GROSS RENT	\$ 258442.	* RATE OF GROWTH OF GROSS RENT	.0086
* EXPENSES	\$ 59124.	* RATE OF GROWTH OF EXPENSES	.0521
* R E TAXES	\$ 63533.	* RATE OF GROWTH OF R E TAXES	.0476
INCOME TAX RATE	.5000	PROJECT VALUE GROWTH OF	6.0000
* VACANCY RATE	.0475	WORKING CAPITAL LOAN RATE	.1200
EQUITY DISCOUNT	.1300	EXTRAORDINARY EXPENSES	\$ 1000.
RESALE COST	.0650	REINVESTMENT RATE	.0500
WKG CAPITAL RS \$	7000.	CAPITAL RESEA INTEREST RATE	.0250
INITIAL COST \$	1088778.	INITIAL EQUITY REQUIRED	\$ 134328.

ALL '*' VALUES ARE AVERAGE AMOUNTS FOR HOLDING PERIOD. OF 10 YRS.

C O M P O N E N T S U M M A R Y

TITLE	PCT.	BEGIN	USEFUL	DEPR				
	DEPR	USE	LIFE	METHOD		COST		SCH
LAND	0.	1	0.	0	\$	138551.		0
BUILDING	1.00	1	33.	5	\$	927227.		0
PARKING	0.50	1	7.	5	\$	8000.		0
FURNISHINGS	0.85	1	10.	5	\$	15000.		0

M O R T G A G E S U M M A R Y

TITLE	INTR	BEGIN	END	TERM		ORIG	PCT
	RATE	YR.	YR.			BALC	VALUE
FIRST MORTGAGE	.0950	1	3	27	\$	813951.	0.752
LAND CONTRACT	.0800	1	3	7	\$	142499.	0.131
REFINANCE MORTGAGE	.0900	4	29	25	\$	1086275.	0.940

P R J F J R M A
INVESTMENT ANALYSIS OF

MRCAP BACKDOOR DEMO

FOR

* MICHAEL ROBBINS *

CASH FLOW ANALYSIS

*****	1977	1978	1979	1980
1 GROSS RENT	241500.	251279.	261455.	261455.
2 LESS VACANCY	11480.	11939.	12417.	12417.
3 LESS REAL ESTATE TAXES	50512.	53038.	55689.	58474.
4 LESS EXPENSES	46920.	48446.	51110.	53921.
5 NET INCOME	132588.	137857.	142239.	136643.
6 LESS DEPRECIATION	61481.	56822.	51592.	48121.
7 LESS INTEREST	88907.	86950.	84823.	97591.
8 TAXABLE INCOME	-17800.	-5916.	5824.	-9069.
9 PLUS DEPRECIATION	61481.	56822.	51592.	48121.
10 LESS PRINCIPAL PAYMENTS	22818.	24775.	26902.	12250.
11 CASH THROW-OFF	20863.	26132.	30514.	26801.
12 LESS TAXES	0.	0.	2912.	0.
13 LESS RESERVES AT 5000.000	5000.	5000.	5000.	1511.
14 CASH FROM OPERATIONS	15863.	21132.	22602.	224610.
15 WORKING CAPITAL LOAN(CUM B)	0.	0.	0.	0.
16 DISTRIBUTABLE CASH AFR TAX	15863.	21132.	22602.	224610.
17 TAX SAVING ON OTHER INCOME	8900.	2958.	0.	4535.
18 SPENDABLE CASH AFTER TAXES	24763.	24090.	22602.	229145.

CASH FLOW ANALYSIS

*****	1977	1978	1979	1980
-------	------	------	------	------

MARKET VALUE

19 BY METHOD - 6 - AT 0.0200	1110554.	1132765.	1155420.	1178528.
20 LESS RESALE COST	72186.	73630.	75102.	76604.
21 LESS LOAN BALANCES	938632.	913857.	886956.	1074025.
22 PLUS CUM. CASH RESERVES	12175.	17479.	22916.	25000.
23 3/4 TAX NET WORTH	111911.	162757.	216278.	52899.
24 CAPITAL GAIN (IF SOLD)	-20466.	30245.	81372.	132923.
25 CAPITAL GAINS TAX	-5117.	7561.	23480.	41523.
26 INCOME TAX ON EXCESS DEP	15769.	29208.	40032.	49120.
27 TOTAL TAX ON SALE	13210.	36769.	63512.	90643.
48 AFTER TAX NET WORTH	98700.	125988.	152767.	-37744.

YEAR OF ANALYSIS

1977

1978

1979

1980

BEFORE TAX RATIO ANALYSIS

28	RETURN ON NET WORTH B/4 TAX	-0.0116	0.6879	0.5163	0.2901
29	CHANGE IN NET WORTH B/4 TAX	-22418.	50847.	53521.	-163379.
30	CASH RTN ON ORIG CASH EQUIY	0.1553	0.1945	0.2272	0.1995
31	PERCENT ORIG EQUITY PAYBACK	0.1181	0.2754	0.4437	2.1158
32	PRESENT VALUE OF PROJECT	1078949.	1127840.	1171417.	1195233.

YEAR OF ANALYSIS

1977

1978

1979

1980

AFTER TAX RATIO ANALYSIS

33	RETURN ON NEW WORTH AFT TAX	-0.0809	0.5205	0.3919	0.2529
34	CHANGE IN NET WORTH AFT TAX	-35628.	27288.	26778.	-190510.
35	CASH RTN ON ORIG CASH EQUIY	0.1844	0.1793	0.1683	1.7059
36	PERCENT ORIG EQUITY PAYBACK	0.1844	0.3637	0.5319	2.2378
37	PRESENT VALUE OF PROJECT	1070710.	1100897.	1123769.	1260110.

38	NET INCOME-MARKET VALUE RTO	0.1194	0.1217	0.1231	0.1159
39	LENDER BONUS INTEREST RATE	0.	0.	0.	0.0002
40	DEFAULT RATIO	0.8661	0.8485	0.8358	0.8500

YEAR OF ANALYSIS

1977

1978

1979

1980

MODIFIED INTERNAL RATE OF RETURN ANALYSIS

RETURN ANALYSIS WITHOUT SALE

41	CUM. AFT TAX SPENDABLE CASH	24763.	50091.	75198.	308103.
42	MJD. I.R.R. ON ORIG EQUITY	-0.8156	-0.3893	-0.1758	0.2306
43	MJD. I.R.R. ON CUM. EQUITY	-0.8157	-0.3893	-0.1758	0.2306

RETURN ANALYSIS WITH SALE

44	CUM. CASH LESS ORIG EQUITY	-10865.	41751.	93636.	136031.
45	CUM. CASH LESS CUM. EQUITY	-10865.	41751.	93636.	136031.
46	MJD. I.R.R. ON ORIG EQUITY	-0.0809	0.1449	0.1928	0.1911
47	MJD. I.R.R. ON CUM. EQUITY	-0.0809	0.1449	0.1928	0.1911

TO CHANGE CASH RETURN BEFORE TAXES BY 1000.
 CHANGE ANY ONE OF THE FOLLOWING

REAL ESTATE TAXES	BY	0.0198	0.0189	0.0180	0.0171
TOTAL EXPENSES	BY	0.0213	0.0206	0.0196	0.0185
FIXED EXPENSES	BY	0.0218	0.0206	0.0196	0.0185
VARIABLE EXPENSES	BY	0.	0.	0.	0.
TOTAL INTEREST PMTS.	BY	0.0112	0.0115	0.0118	0.0102
TOTAL PRINCIPAL PMTS.	BY	0.0438	0.0404	0.0372	0.0816
WORKING CAPITAL LOAN	BY	0.	0.	0.	0.
GROSS INCOME	BY	0.0041	0.0040	0.0038	0.0038
FIXED INCOME	BY	0.0044	0.0042	0.0040	0.0040
VARIABLE INCOME	BY	0.0840	0.0800	0.0762	0.0762

COMPONENTS

=====

INITIAL INVESTMENT	BY	0.0198	0.0189	0.0180	0.0171
LAND	BY	0.1556	0.1482	0.1411	0.1344
BUILDING	BY	0.0232	0.0221	0.0211	0.0201
PARKING	BY	2.6944	2.5661	2.4439	2.3275
FURNISHINGS	BY	1.4370	1.3686	1.3034	1.241

3

MORTGAGES

=====

FIRST MORTGAGE	BY	0.0119	0.0119	0.0119	0.
LAND CONTRACT	BY	0.0365	0.0365	0.0365	0.
REFINANCE MORTGAGE	BY	0.	0.	0.	0.0091

SENSITIVITY ANALYSIS

=====

DEFAULT RATE - NEEDED -	0.8500	0.8500	0.8500	0.8500
DEFAULT RATE - ACTUAL -	0.8661	0.8485	0.8358	0.8500
DIFFER -	-0.0161	0.0015	0.0142	0.

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

CASH OUTLAYS	1977	1978	1979	1980
--------------	------	------	------	------

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REAL ESTATE TAXES	BY	-0.0478	0.0474	0.0469	0.0447
TOTAL EXPENSES	BY	-0.0515	0.0519	0.0512	0.0485
FIXED EXPENSES	BY	-0.0526	0.0519	0.0512	0.0485
VARIABLE EXPENSES	BY	0.	0.	0.	0.
TOTAL INTEREST PMTS.	BY	-0.0272	0.0289	0.0303	0.0268
TOTAL PRINCIPAL PMTS.	BY	-0.1058	0.1014	0.0972	0.2134
WORKING CAPITAL LOAN	BY	0.	0.	0.	0.
GROSS INCOME	BY	0.0087	-0.0035	-0.0084	-0.0085
FIXED INCOME	BY	0.0091	-0.0089	-0.0088	-0.0089
VARIABLE INCOME	BY	0.1758	-0.1706	-0.1666	-0.1694

COMPONENTS

=====

INITIAL INVESTMENT	BY	-0.0478	0.0474	0.0469	0.0447
LAND	BY	-0.3757	0.3723	0.3689	0.3514
BUILDING	BY	-0.0561	0.0556	0.0551	0.0525
PARKING	BY	-6.5069	6.4480	6.3896	6.0853
FURNISHINGS	BY	-3.4703	3.4389	3.4078	3.2455

MORTGAGES

=====

FIRST MORTGAGE	BY	-0.0286	0.0298	0.0310	0.
LAND CONTRACT	BY	-0.0882	0.0918	0.0955	0.
REFINANCE MORTGAGE	BY	0.	0.	0.	0.0239

PARTNERSHIP INVESTMENT SUMMARY

FOR

LEAN-2 HOMES

OWNERSHIP FORM
CORPERATION WITH OUTSIDE EARNINGS

=====

MODIFIED INTERNAL RATE OF RETURN ANALYSIS

=====

RETURN ANALYSIS WITHOUT SALE

=====

1977 1978 1979 1980

CUM. AFT TAX SPENDABLE CASH,	15747.	32641.	50311.	180376.
MOD. I.R.R. ON ORIG EQUITY	-0.7655	-0.3029	-0.0918	0.2801
MOD. I.R.R. ON CUM. EQUITY	-0.7656	-0.3029	-0.0918	0.2801

RETURN ANALYSIS WITH SALE

=====

1977 1978 1979 1980

CUM. CASH LESS ORIG EQUITY	-1852.	29207.	62307.	98323.
CUM. CASH LESS CUM. EQUITY	-11927.	19132.	52232.	88248.
MOD. I.R.R. ON ORIG EQUITY	-0.0276	0.1979	0.2445	0.2529
MOD. I.R.R. ON CUM. EQUITY	-0.0276	0.1979	0.2445	0.2529

PARTNERSHIP INVESTMENT SUMMARY

FOR

LEAN-2 HOMES

OWNERSHIP FORM CORPERATION WITH OUTSIDE EARNINGS

=====

INCOME TAX RATE	.4800	SHARE OF EQUITY CONTRIBUTION	.5000
MAX. CAPITAL GAIN RATE	.2400	INITIAL CASH CONTRIBUTION	57090.
DISCOUNT RATE	.1400	SHARE OF EQUITY REVERSION	.5000
REINVESTMENT RATE	.0700	SHARE OF DISTRIBUTABLE CASH	.5500
SHARE INC TAX PMT	.5000	MAX. BASIS AMOUNT	610302.
GENERAL PARTNER		SHARE OF TAX LOSSES	.5000
W/ CONTRACT LIABILITY OF		10075.	

CASH FLOW	1977	1978	1979	1980
=====				
TAXABLE INCOME	-8900.	-2958.	2912.	-4535.
CASH THROW-OFF	11475.	14372.	16783.	14741.
LESS TAXES	0.	0.	1398.	0.
DISTRIBUTABLE CASH AFTER TAX	11475.	14372.	15385.	124366.
TAX SAVINGS ON OTHER INCOME	4272.	1420.	0.	2177.
SPENDABLE CASH AFTER TAXES	15747.	15792.	15385.	126543.
NET WORTH OF SHARE	55955.	81379.	108139.	26450.
CAPITAL GAIN (IF SOLD)	-10233.	15123.	40686.	66461.
CAPITAL GAIN TAX,	-1179.	3629.	9765.	17761.
INCOME TAX ON EXCESS DEPR	7569.	14020.	19215.	23578.
TOTAL TAX ON SALE	6390.	17649.	28980.	41339.
AFTER TAX NET WORTH	49565.	63729.	79159.	-14889.

BEFORE TAX RATIO ANALYSIS	1977	1978	1979	1980
=====				
CASH RTN ON ORIG CASH EQUITY	0.1486	0.1861	0.2173	0.1908
PERCENT ORIG EQUITY PAYBACK	0.1486	0.3346	0.5338	2.1440
PRESENT VALUE OF SHARE	59149.	83743.	105443.	56841.

AFTER TAX RATIO ANALYSIS	1977	1978	1979	1980
=====				
CASH RTN ON ORIG CASH EQUITY	0.2039	0.2045	0.1992	1.6383
PERCENT ORIG EQUITY PAYBACK	0.2039	0.4083	0.6075	2.2459
PRESENT VALUE OF SHARE	57291.	75002.	89779.	102457.

PARTNERSHIP INVESTMENT SUMMARY

FOR

JACK JONES

OWNERSHIP FORM
INDIVIDUAL

.....

MODIFIED INTERNAL RATE OF RETURN ANALYSIS

.....

RETURN ANALYSIS WITHOUT SALE

.....

1977 1978 1979 1980

CUM. AFT TAX SPENDABLE CASH,	9819.	19431.	28586.	99951.
MOD. I.R.R. ON ORIG EQUITY	-0.8173	-0.3986	-0.1897	0.1679
MOD. I.R.R. ON CUM. EQUITY	-0.8173	-0.3987	-0.1897	0.1679

RETURN ANALYSIS WITH SALE

.....

1977 1978 1979 1980

CUM. CASH LESS ORIG EQUITY	5438.	28694.	52807.	29848.
CUM. CASH LESS CUM. EQUITY	5438.	28694.	52807.	29848.
MOD. I.R.R. ON ORIG EQUITY	0.1012	0.2386	0.2563	0.1168
MOD. I.R.R. ON CUM. EQUITY	0.1012	0.2386	0.2563	0.1168

PARTNERSHIP INVESTMENT SUMMARY

FOR

JACK JONES

OWNERSHIP FORM

INDIVIDUAL

=====

INCOME TAX RATE	.5000	SHARE OF EQUITY CONTRIBUTION	.4000
MAX. CAPITAL GAIN RATE	.2500	INITIAL CASH CONTRIBUTION	53731.
DISCOUNT RATE	.1300	SHARE OF EQUITY REVERSION	.5000
REINVESTMENT RATE	.0600	SHARE OF DISTRIBUTABLE CASH	.3000
SHARE INC TAX PMT	.4000	MAX. BASIS AMOUNT	438241.
LIMITED PARTNER-		SHARE OF TAX LOSSES	.4000

CASH FLOW	1977	1978	1979	1980
=====				

TAXABLE INCOME	-7120.	-2366.	2320.	-3628.
CASH THROW-OFF	6259.	7840.	9154.	3040.
LESS TAXES	0.	0.	1165.	0.
DISTRIBUTABLE CASH AFTER TAX	6259.	7840.	7989.	67336.
TAX SAVINGS ON OTHER INCOME	3560.	1133.	0.	1814.
SPENDABLE CASH AFTER TAXES	9819.	9023.	7989.	69650.

NET WORTH OF SHARE	55955.	81379.	108139.	26450.
CAPITAL GAIN (IF SOLD)	-10233.	15123.	40686.	66461.
CAPITAL GAIN TAX,	-1279.	3781.	10172.	18261.
INCOME TAX ON EXCESS DEPR	7384.	14604.	20016.	24560.
TOTAL TAX ON SALE	6605.	18384.	30187.	42821.

AFTER TAX NET WORTH	49350.	62994.	77952.	-16372.
---------------------	--------	--------	--------	---------

BEFORE TAX RATIO ANALYSIS

=====	1977	1978	1979	1980

CASH RTN ON ORIG CASH EQUITY	0.1165	0.1459	0.1704	0.1496
PERCENT ORIG EQUITY PAYBACK	0.1165	0.2624	0.4111	1.6736
PRESENT VALUE OF SHARE	55057.	75410.	92969.	39176.

AFTER TAX RATIO ANALYSIS

=====	1977	1978	1979	1980

CASH RTN ON ORIG CASH EQUITY	0.1827	0.1679	0.1487	1.2963
PERCENT ORIG EQUITY PAYBACK	0.1827	0.3507	0.4994	1.7956
PRESENT VALUE OF SHARE	52362.	65089.	75317.	53969.

PARTNERSHIP INVESTMENT SUMMARY
 FOR
 REAL ESTATE DYNAMICS
 OWNERSHIP FORM
 CORPORATION WITHOUT OUTSIDE EARNINGS
 =====

MODIFIED INTERNAL RATE OF RETURN ANALYSIS
 =====

RETURN ANALYSIS WITHOUT SALE
 =====

	1977	1978	1979	1980
CUM. AFT TAX SPENDABLE CASH,	3521.	7747.	12583.	47330.
MOD. I.R.R. ON ORIG EQUITY	-0.7379	-0.2406	-0.0215	0.3701
MOD. I.R.R. ON CUM. EQUITY	-0.7379	-0.2406	-0.0215	0.3701

RETURN ANALYSIS WITH SALE
 =====

	1977	1978	1979	1980
CUM. CASH LESS ORIG EQUITY	-9912.	-5686.	-849.	33897.
CUM. CASH LESS CUM. EQUITY	-9912.	-5686.	-849.	33897.
MOD. I.R.R. ON ORIG EQUITY	-0.7379	-0.2406	-0.0215	0.3701
MOD. I.R.R. ON CUM. EQUITY	-0.7379	-0.2406	-0.0215	0.3701

PARTNERSHIP INVESTMENT SUMMARY

FOR

REAL ESTATE DYNAMICS

OWNERSHIP FORM

CORPORATION WITHOUT OUTSIDE EARNINGS

=====

INCOME TAX RATE	.2200	SHARE OF EQUITY CONTRIBUTION	.1000
MAX. CAPITAL GAIN RATE	.1100	INITIAL CASH CONTRIBUTION	13433.
DISCOUNT RATE	.1000	SHARE OF EQUITY REVERSION	.
REINVESTMENT RATE	.0500	SHARE OF DISTRIBUTABLE CASH	.1500
SHARE INC TAX PMT	.1000	MAX. BASIS AMOUNT	122060.
LIMITED PARTNER		SHARE OF TAX LOSSES	.1000

CASH FLOW	1977	1978	1979	1980
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=====

TAXABLE INCOME	-1780.	-592.	582.	-907.
CASH THROW-OFF	3129.	3920.	4577.	4020.
LESS TAXES	0.	0.	128.	0.
DISTRIBUTABLE CASH AFTER TAX	3129.	3920.	4449.	33918.
TAX SAVINGS ON OTHER INCOME	392.	130.	0.	200.
SPENDABLE CASH AFTER TAXES	3521.	4050.	4449.	34118.

NET WORTH OF SHARE	0.	0.	0.	0.
CAPITAL GAIN (IF SOLD)	0.	0.	0.	0.
CAPITAL GAIN TAX,	0.	0.	0.	0.
INCOME TAX ON EXCESS DEPR	0.	0.	0.	0.
TOTAL TAX ON SALE	0.	0.	0.	0.

AFTER TAX NET WORTH	0.	0.	0.	0.
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BEFORE TAX RATIO ANALYSIS

=====

	1977	1978	1979	1980
CASH RTN ON ORIG CASH EQUITY	0.2330	0.2918	0.3407	0.2993
PERCENT ORIG EQUITY PAYBACK	0.2330	0.5248	0.8560	3.3810
PRESENT VALUE OF SHARE	2845.	6084.	9523.	12269.

AFTER TAX RATIO ANALYSIS

=====

	1977	1978	1979	1980
CASH RTN ON ORIG CASH EQUITY	0.2621	0.3015	0.3312	2.5399
PERCENT ORIG EQUITY PAYBACK	0.2621	0.5636	0.8948	3.4347
PRESENT VALUE OF SHARE	3201.	6548.	9891.	33193.

* = AFTER TAX NET WORTH

[illegible]

YEARS

08/12/77

MRCAP BACKDOOR DEMO

* = B/4 TAX NET WORTH

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280	-									*****
1										*****
270	-									*****
1										*****
260	-									*****
1										*****
250	-									*****
1									*****	*****
240	-								*****	*****
1									*****	*****
230	-								*****	*****
1									*****	*****
220	-								*****	*****
1			*****						*****	*****
210	-		*****					*****	*****	*****
1			*****					*****	*****	*****
200	-		*****					*****	*****	*****
1			*****					*****	*****	*****
190	-		*****					*****	*****	*****
1			*****					*****	*****	*****
180	-		*****					*****	*****	*****
1			*****					*****	*****	*****
170	-		*****					*****	*****	*****
1		*****	*****			*****	*****	*****	*****	*****
160	-	*****	*****			*****	*****	*****	*****	*****
1		*****	*****			*****	*****	*****	*****	*****
150	-	*****	*****			*****	*****	*****	*****	*****
1		*****	*****			*****	*****	*****	*****	*****
140	-	*****	*****			*****	*****	*****	*****	*****
1		*****	*****			*****	*****	*****	*****	*****
130	-	*****	*****			*****	*****	*****	*****	*****
1		*****	*****		*****	*****	*****	*****	*****	*****
120	-	*****	*****		*****	*****	*****	*****	*****	*****
1		*****	*****		*****	*****	*****	*****	*****	*****
110	-	*****	*****		*****	*****	*****	*****	*****	*****
1		*****	*****		*****	*****	*****	*****	*****	*****
100	-	*****	*****		*****	*****	*****	*****	*****	*****
1		*****	*****		*****	*****	*****	*****	*****	*****
90	-	*****	*****		*****	*****	*****	*****	*****	*****
1		*****	*****		*****	*****	*****	*****	*****	*****
80	-	*****	*****		*****	*****	*****	*****	*****	*****
1		*****	*****		*****	*****	*****	*****	*****	*****
70	-	*****	*****		*****	*****	*****	*****	*****	*****
1		*****	*****		*****	*****	*****	*****	*****	*****
60	-	*****	*****		*****	*****	*****	*****	*****	*****
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	7	7	7	8	8	8	8	8	8	8
	7	8	9	0	1	2	3	4	5	6

* = SPENDABLE CASH AFTER TAX

USED 80.37 UNITS
RUN COST

COST 20:47CDT 08/12/77

ACCRUED CHARGES SINCE SIGNIN
S 10.55 COMPUTER
26.71 CONNECT
8.78 CHARACTERS
-17.75 EDU DISC
S 28.29 TOTAL
EFFICIENCY = 32.9

USED .41 UNITS
BYE
00083.85 CRU 0002.13 TCH 0069.86 KC

OFF AT 20:47CDT 08/12/77.

SECOND MORNING SESSION

2.000 The Basic Case - A Site in Search of a Market

Feasibilities may begin with a site already owned for which a fitting use is sought; an appraisal always begins with a specific property in search of a most fitting use. While a consumer orientation would preferably select a site after a specific use had been defined, the more common situation is a client whose flexibility and alternative courses of action are greatly reduced to those inherent in a single site.

- 2.100 To begin with the familiar and to make it strange with more careful identification of attributes than is the appraisal custom does not mean that intensive specialty analysis and its inherent cost is necessary before preliminary economic tests are made; much of the analysis can essentially be defined potential uses and a priority of limiting conditions on the report.
- 2.200 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:
 - 2.210 Static attributes - physical characteristics of size, shape, topography, soils, etc.
 - 2.220 Legal attributes - public controls, private agreements and potential legislation defining use.
 - 2.230 Linkage attributes - relationships to other sites which may tend to generate movements of goods and people to the subject site.
 - 2.240 Dynamic attributes - characteristics which affect behavior such as visibility, prestige, or feeling of fear or anxiety.
 - 2.250 Environmental impact attributes on physical, social, or economic factors off-site.
- 2.300 Static attributes analyzed should include the facts and the implications of the following:
 - 2.310 Size, shape, and area
 - 2.320 Topography, soils, slope stability, potential for subsidence
 - 2.330 Water table, water resources (streams & ponds) and bulkhead lines
 - 2.340 All set-back lines and building envelopes
 - 2.350 Access routes (proximity is not accessibility)
 - 2.360 Concealed utility easements, old foundations, etc.
 - 2.370 Flood plains which have been determined by Corp. of Engineers, etc.
 - 2.380 Scarce environmental elements which may mean environmental impact litigation
 - 2.390 Landmarks or historical structures

- 2.400 Legal attributes inventory should include both specific controls such as zoning, and identify external public or private controls on use or potential legislation or administrative attitudes and procedures which would impact on owner alternatives for use.
 - 2.410 Legal uses under zoning alternatives and limitations on FAR, parking, signing, etc.
 - 2.420 Special zoning options such as PUD, down zoning alternatives, etc. available at owners option.
 - 2.430 Premises of community master plans still in incubation process
 - 2.440 Tax conservancy or abatement commitments
 - 2.450 Extra territorial zoning or subdivision powers
 - 2.460 Attitudes of sewer, water, and highway commissions
 - 2.470 Contractual agreements among previous buyers and sellers which may or may not run with the land
 - 2.480 Planner views of physical barriers to restrict "sprawl"
 - 2.490 Existing or impending legislation should be anticipated relative to:
 - 2.491 Septic tank installation
 - 2.492 Ground water, depth and conservation of high water recharge areas
 - 2.493 Salt water encroachment
 - 2.494 Conservation of environmental edges
 - 2.495 Conservation of prime agricultural land
 - 2.496 Water quality standards
 - 2.497 Air quality standards
- 2.500 Analysis of the static and legal attributes should be summarized in terms of competitive advantages and disadvantages for costs, pricing, and marketing.
 - 2.510 Some attributes lead to higher cost which the front door approach (See Section 3.000) may reveal as leading to excessive rents or prices.
 - 2.520 Some static or legal 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.
 - 2.530 Static attributes will also help identify "best use" or the most probable buyer.

- 2.540 Lack of fit between static site attributes and merchandising data is a basic cause of unsuccessful projects.
- 2.600 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.
 - 2.610 Streets, sidewalks, rail, and transit systems serving the site.
 - 2.620 Access points
 - 2.621 Traffic department controls, present and proposed
 - 2.622 Rail switching and truck tariff zones
 - 2.623 Indirect controls imposed by factors affecting behavior. (See dynamic attributes, 5.000)
 - 2.630 Utility services are linkages, too.
 - 2.631 Sewer and storm water capacities
 - 2.632 Water, gas, and electric hook-ups, availability and capacity
 - 2.633 Community energy supplies and sources
 - 2.634 Implicit resources such as stock of wild game, labor pools, alternatives to the auto, etc.
 - 2.640 Capacity of existing transportation systems to absorb unit volume generated on site and implications for off-site improvements budgets.
 - 2.650 Relationship of subject site to generators of potential needs and uses for the subject site.
 - 2.651 Employment centers
 - 2.652 School system alternatives
 - 2.653 Retail services
 - 2.654 Complimentary existing nearby uses
 - 2.655 Recreational services
 - 2.656 Health care systems
 - 2.657 Security systems
 - 2.658 Waste disposal services
 - 2.660 Neighborhood demographics (population, age, employment, income, etc.)
 - 2.670 Relationship to competitive alternatives and projects and exposure to interception of linkages.

- 2.700 Dynamic attributes have to do with the mental or emotional responses which a site or project stimulates as it affects decision making behavior. These decision makers may be property buyers, regulators of site use, customers of establishments located on the site, or peer groups which set community attitudes or make decisions for others by proxy (Board of Elderly Care Organization).
- 2.710 Image conditioning of the approach zone
- 2.720 Visual factors in terms of prominence of the site, views from the site, potential for controlled sight lines, etc.
- 2.730 Anxiety factors of access and security
- 2.740 Noise as a function of traffic count (FHA noise pollution manual).
- 2.750 Prevailing air currents and airborne pollution (phosphate plants or sulphite paper mills, for example).
- 2.760 Political images established for a site by the public positions of local politicians or vested interest groups.
- 2.770 Historical community reputation and values attached to the project site and structures.
 - 2.771 Recycling of old buildings within existing urban areas is fashionable among architects and the upper class.
 - 2.772 Recycling may establish historical roots and images.
- 2.800 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 regulation 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?
 - 2.810 Physical factors of the environment
 - 2.811 Soil stability and water tables beyond the site boundaries
 - 2.812 Eutrophication of lakes and streams

- 2.813 Disruption of environmental edges, plant, and wildlife areas
- 2.814 Impact on energy resources
- 2.815 Contribution to social disintegration
- 2.816 Aesthetic and urban design
- 2.820 Social factors of the environment
 - 2.821 Displacement of existing residents and neighborhood units
 - 2.822 Contribution to social integration or mobility barriers
 - 2.823 Contribution to land use heterogeneity
 - 2.824 Contribution to regional and community master plans
- 2.830 Economic factors of the environment
 - 2.831 Direct impact on real estate tax revenues
 - 2.832 Direct impact on other governmental revenue
 - 2.833 Direct impact on incremental government
 - 2.834 Secondary contributions to local government revenues
 - 2.835 Secondary cost burdens created for local communities
- 2.840 Real estate business ethic environment
 - 2.841 Impact on supply equilibrium
 - 2.842 Impact on associated contractors
 - 2.843 Impact on families of project sponsor
 - 2.844 Legitimacy of financing structure
- 2.850 Silhouette of proposed project in terms of public perception of impact.
- 2.860 Relationship of impact assessment to:
 - 2.861 Scale of project
 - 2.862 Vulnerability of project sponsor to secondary consequences of political discretion
 - 2.863 Stamina of project sponsor in the face of public pressure

7.000 Selecting Market Targets or a Market Position Within a Defined Market Opportunity

Notwithstanding the feasibility analyst is a generalist, whose conclusions must be confirmed at a later stage of planning, the analyst is expected to place his major effort on development of a merchandising strategy designed to secure a competitive market position for the project proposal.

- 7.100 Free enterprise is the art of creating one's own monopoly, if only for a moment, in the mind of the buyer, monopoly characteristics depend on careful market segmentation.
 - 7.110 Site and building characteristics of an existing building already provide a product profile which suggests the market segments.
 - 7.120 Preferably careful identification of the prospect will permit development of a customer profile who will be the source of a product profile that would provide the most satisfaction.
- 7.200 As a result of merchandising research the analyst should be able to construct a hypothetical marketing program which defines:
 - 7.210 The most probable user groups and their effective demand constraints.
 - 7.220 The timing of their effective demand in the market.
 - 7.230 The competitive standard product minimum.
 - 7.240 The competitive product edge necessary for monopoly advantage
 - 7.250 Basic elements of a required promotion program
- 7.300 To build these assumptions or marketing hypothesis the first clue to segmentation may be found in correctly understanding the essence of buyer motivation or of the activity to be housed.
 - 7.310 Retailing is a break point for goods (a warehouse grocery), or a service industry, or a theater using lighting, staging, and mood to reinforce a role played by the buyer.
 - 7.320 A restaurant may be to provide a quick food break (high turnover, pedestrian flow, conditioned ordering), or to provide recreational entertainment and consumption of an evening, or to provide a staging for business, social, or publicity roles.

7.800 Generalized Format of Merchandising Report Summary

Cash flows ultimately depend on sales or rental revenues and further refinements of the frontdoor-backdoor approaches depend on establishing an explicit set of assumptions about the geographical market area, the user segment within that market area, and so on. All you buy in a real estate investment is a set of assumptions about the market. Therefore, the analyst should provide and identify a marketing assumption checklist for the reader:

7.810 Definition of geographic and demographic market.

7.811 Primary trade area to be served

7.812 Profile of prospects by current location, status, income, etc. in primary carefully segmented area.

7.813 Secondary trade area to be served

7.814 Profile of prospects by current location, status, income, etc. in secondary carefully segmented area.

7.820 Definition of principal competitors

7.821 Existing supply.

7.822 Prospective supply with timeline advantage.

7.823 Competitive standard package of project features.

7.824 Unique features of successful competitors.

7.825 Probable cause of unsuccessful competitors.

7.826 Merchandising appeals of competitors.

7.827 Definition of market penetration and competitive gap.

7.830 Establishment of merchandising strategy logic

7.831 Competition

- . Standard product
- . Price and quality
- . Competitive edge opportunity

7.832 Positioning strategy

- . Sales themes
- . Name and byline
- . Site and unit features
- . Strong sales points

7.833 Construction and architecture

- . Sales area
- . Models
- . Entrance and signs
- . Project amenities
- . Roads and paving
- . Site plan
- . Construction schedule

7.840 Definition of prospect target for subject property

7.841 Recommendations on site location

7.842 Recommendations on site linkages and dynamics

7.843 Recommendations on building types and numbers

7.844 Recommendations on basic unit features

7.845 Recommendations on basic unit options

7.846 Recommendations on level of quality

7.847 Recommendations on basic price targets

8.000 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.

8.100 Format of the report should rely on three elements:

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

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

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

8.200 To be terse the executive summary should depend on:

8.210 Simple charts of choices of alternative outcomes (See Exhibit 21).

8.220 Simple flow charts (Such as Exhibits 3,7,13,22).

8.230 Specific criteria used to measure "likelihood of success"

8.300 Statement of limiting conditions should first begin with a definition of the word "feasible" (as per Institute of Appraisal Terminology Handbook), and then state that it was the purpose of the study to define the context of the situation and the parameters within which a solution might be found to fit the major constraints with a reasonable likelihood of success. It should carefully point out that the generalist has made a series of explicit assumptions which may nevertheless need confirmation by more detailed study best done by specialists. The statement of limiting conditions should further emphasize the constraints and objectives placed on the study by identifying who:

8.310 Defined the constraints

8.320 Defined success

8.330 Provided the data and assumptions

8.340 Permitted key assumptions to remain untested for economy or speed

8.350 Accepted assumptions of conditions of uncertainty

8.360 Assembled proforma financial statements and projections

8.370 Executed feasibility confirmation of key assumptions with aid of specialists.

8.380 Placed limitations on use and confidentiality.

REAL ESTATE DECISION MAKING

A Seminar on Issues of the Next Five Years

Sponsored by:

The Wichita Board of Realtors &
Center for Management Development
Wichita State University
Monday, January 12, 1976

Instructed by Prof. James A. Graaskamp
University of Wisconsin School of Business

- I. Introduction to the Basic Concepts of Real Estate
 - A. Real estate defined
 - B. Real estate enterprises identified
 - C. The real estate process described
 - D. The real estate business defined
 - E. Real estate investment
 - F. Real estate risk
- II. Fitting the Form of Real Estate Decisions to the Context
 - A. The handicap of old terminology
 1. Highest and best use vs. most fitting use
 2. Fair market value vs. most probable sale price
 3. Normalized net income vs. cash flow projections
 - B. Elements of real estate context in the late 70's
 1. Strategic objectives
 2. Market trends
 3. Merchandising monopolies
 4. Legal-political process
 5. Physical-technical innovation
 6. Community compatibility
 7. Federal income tax modification
 8. Reverse leverage investment
 9. Separation of ownership and management
 10. Greater professionalization of real estate
- III. Real Estate Strategy
 - A. Shift from quick nickel to slow quarter profit centers
 - B. Shift from new construction to recycling existing structures
 - C. Local combination of public objectives soliciting private investors
 1. Subsidized housing
 2. Public financing by a tax increment bonding
 3. Impact zoning
 4. More skillful use of user charges and subcontracting of public functions to private industry

D. Market trend-changing definition of efficiencies

1. More housing tradeoffs of location and size against energy costs
2. More subsidy for lower income families
3. More direct and indirect penalties on corporate surplus real estate
4. More comprehensive analysis of full space cost/benefits
5. Small scale, short term time horizons

E. Merchandising monopolies - think small !

1. Precise market segmentation
2. Direct consumer research
3. Rifled advertising

IV. Technical Innovation and Modifications

A. Improved definition of private and public rights to land

B. New devices for regional land planning

C. Drastic modification of building styles for energy conservation

1. Subsidy of existing structure modernization
2. Economic constraints on new structure design
3. Intensive reeducation of professionals on thermal design and transportation economics
4. Decentralization of business + compression of residential densities

D. Land use planning innovations

1. Negotiated zoning densities
2. Impact zoning allocation of imputed costs

V. Necessity of Sophisticated Financial Analysis

A. Replacement of federal income tax gains with concern for inherent income productivity of investment property.

B. Ownership - control of profit centers and diversion of cash flows

1. Private investment and private ownership
2. Banking institutions diverting cash flows through reverse leverage - hence more equity dollars per deal

C. Appreciation of the limited partnership as an equity device rather than a tax device.

D. Real estate tax as a form of public ownership and modification of assessors qualifications.

1. A classified real estate tax system
2. Development of common data banks

E. Profit center enterprise - further separation of ownership and management or total integration of ownership and management.

1. Consolidation of management either way means greater professionalization of management skills
2. Consolidation of marketing skills with other profit centers will lead to significant restructuring of brokerage fee systems.
3. Real estate management science will learn by analogy to other fields such as risk management, investment banking, consumer research, architectural service contracts, etc.

REAL ESTATE SEMINAR
First Chicago Corporation
Livingston House, Lake Forest, Illinois
November 6, 1973
Presented by Professor James A. Graaskamp

I. Some Basic Real Estate Attributes and Definitions

- A. A space-time interface of land (public resource), people (cultural preference) and artifacts (improvements)
- B. Convert neutral forces to identified decision makers - consumer, producer, and society with the planner as the arbitrator.
- C. Some implications of this definition of the Real Estate process:
 - 1. Land is an exhaustible resource and therefore a public utility.
 - 2. Business of Real Estate is the process of converting space-time to money-time.
 - 3. Real Estate Business is a service industry using manufactured products.
 - 4. The space-time service product is the social terrarium and therefore of public concern
 - 5. The money not the Real Estate is the only private property.
- D. The legal concept of private Real Estate
 - 1. Private property the residual after subtracting public rights.
 - 2. In a service industry there is no ownership of a product - only control of a customer.
 - 3. Twentieth Century Real Estate equity is a degree to which one controls disbursements of a captive customer.
- E. Feasibility is a nonfinancial concept of matching artifact and service to a context of public priorities and customer needs.
- F. Real Estate investment is "buying" a set of financial assumptions derivative of a feasible solution.
- G. Risk is the variance between assumptions taken and realizations achieved, between proforma estimates and P and L realized.

II. The Systems Approach to Management and Feasibility Analysis

- A. A general concept of the management process converted to Real Estate semantics

<u>Column 1</u>	<u>Column 2</u>
Values, objectives, policy	Strategic format
Search for opportunity alternatives	Market trend analysis
Selection of an opportunity	Merchandising target with monopoly character
Program to capture opportunity	Legal-political constraints
	Ethical-aesthetic constraints
	Physical-technical constraints
	Financial constraints
Construction of program	Project Development
Operation of program	Property Management
Monitoring and feedback	Real Estate research

- B. Strategic format for developer-investor taking an active management role
 - 1. Development role assumed (see attached mimeos)
 - 2. Major objective
 - 3. Key determinants of economic success
 - 4. Elements of cost/price relationship where developer has some control
 - 5. Elements of greatest variance or slippage
 - 6. Devices for minimizing maximum potential loss
 - 7. Devices for maximizing control
 - 8. Developer skills or personnel of critical importance
 - 9. Marginal components of cost/price/profit centers
- C. Strategic format for the passive investor (ie. mortgage lender)
 - 1. Pleasure, pain and bail-out theory of mortgage finance
 - 2. Incentives and the time line of financial events
 - 3. The ethical-aesthetic constraint for the lender

III. Real Estate Finance is the Conversion of Space-Time Events to Money-Time Events in Terms of Outlays and Receipts.

- A. Elements of a project financial model
 - 1. Time line of financial events for investor
 - 2. Profit centers available within time line
 - 3. Capital budget
 - 4. Operating pattern of receipts and expenditures
 - 5. Financing package
 - 6. Basic tax strategy
 - 7. Selected measures of yield comparison
 - 8. Selected measures of risk qualification
- B. A basic cash flow model defines one alternative outcome
 - 1. Analysis searches for capacity for variance
 - 2. Decisions relate to acceptable degree of variance
 - 3. Front door and back door approach to financial feasibility
- C. Selected measures of risk
 - 1. Expense and default ratios
 - 2. Ratio of overruns to stand-by capacity
 - 3. Payback ratios
- D. Selected measures of yield
 - 1. Retrospective vs. prospective (average vs. marginal rates)
 - 2. Cash on cash
 - 3. Definition of the profit center frame
 - 4. Problems in defining long term average yield
 - 5. High yields are made in the short run as a return to management not capital.

E. Cash flow density models as an analytical tool for lenders

IV. The Risk Management Approach to Feasibility and Packaging

- A. Identification of elements of variance in assumptions
- B. Estimating consequences to determine significant exposures to loss

- C. Selection of a risk management device meeting decision maker policies
 - 1. Avoid
 - 2. Reduction of the unknown through research
 - 3. Reduction of variance forecast errors through combination
 - 4. Reduction in severity by limits on scale
 - 5. Shift of risk by contract
 - 6. Limitation of risk of maximum loss by contract
 - 7. Hedging of time trends by contract
- D. Distinguishing between static risks and dynamic risks for purposes of control
 - 1. Static risks can only cause a loss and should be controlled mechanically.
 - 2. Dynamic risks can produce a profit or a loss and should be controlled through management incentives.
- E. Monopoly is a major real estate risk management device
 - 1. Profiling the merchandising target
 - 2. Naming the prospect
 - 3. Tailoring the product
 - 4. Flexibility for recycling to another target
- V. Implication of Current Trends Affecting Real Estate
 - A. Control of new land development plus control of auto transit means recycling of intown sites.
 - B. Energy crisis will redefine linkages to utilities regionally as well as locally.
 - C. Energy crisis will alter expansive character of current leisure time marketing to reduce dependency on hardware.
 - D. Energy crisis will mean redefinition of the auto and all auto dependent forms of land use.
 - E. Trend toward condominium and homeowners association means success of hardware is tied directly to success of group organization software.
 - F. As real estate becomes recognized as a service product, fee ownership declines in significance.

REAL ESTATE TRENDS AND RISK MANAGEMENT
Kellogg Center, Michigan State University
Thursday, January 31, 1974

Advanced Income Property Seminar
Mortgage Bankers Association of America

Instructed by Professor James A. Graaskamp
University of Wisconsin School of Business

- I. Some Basic Real Estate Attributes and Definitions
 - A. A space-time interface of land (public resource), people (cultural preference) and artifacts (improvements).
 - B. Convert neutral forces to identified decision makers - consumer, producer, and society with the planner as the arbitrator.
 - C. Some implications of this definition of the Real Estate process:
 1. Land is an exhaustible resource and therefore a public utility.
 2. Business of Real Estate is the process of converting space-time to money-time.
 3. Real Estate Business is a service industry using manufactured products.
 4. The space-time service product is the social terrarium and therefore a public utility.
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 - D. The legal concept of private Real Estate
 1. Private property the residual after subtracting public rights.
 2. In a service industry there is no ownership of a product - only control of a customer.
 3. Twentieth Century Real Estate equity is a degree to which one controls disbursements of a captive customer.
 - E. Feasibility is a nonfinancial concept of matching artifact and service to a context of public priorities and customer needs.
 - F. Real Estate investment is "buying" a set of financial assumptions derivative of a feasible solution.
 - G. Risk is the variance between assumptions taken and realizations achieved, between proforma estimates and P and L realized.
- II. Real estate investment decisions may often finally depend on a question of the expected rate of return and the risk incurred in pursuing that investment return. There is a natural tendency in appraisal to consider the net income figure and the over-all investment as fixed numbers--as conditions of certainty.

- A. An investment in a bond can be defined as to when it begins in time, when it is sold, when coupons are collectable and total costs and total receipts under alternative outcomes. Thus, yield is easily computed and risk depends on whether you can rely on the promisor.
 - B. Real estate financial analysis seldom enjoys such a rigid set of financial specifications and therefore seldom enjoys reasonable conditions of certainty.
 - C. To talk about risk and compare it between investments implies some explicit measures rather than simply subjective doubt--expressed by a shrug of the shoulders.
 - D. Modern management defines risk as the potential variance between expectations and realizations, i.e., between proforma prospects and historical balance sheet and P & L statements.
 - 1. Variance sometimes is a binary--yes-no question. You will or you won't receive zoning approval.
 - 2. Variance sometimes is the possible range around an average or a median--a distribution of alternative costs or revenue possibilities.
 - E. For ease of analysis there are two kinds of risks:
 - 1. Dynamic risks can produce profit or loss and are best controlled by the finesse of management execution of a plan.
 - 2. Static risks are those which can only cause a loss due to surprise upset of a plan.
 - F. Risk evaluation or comparison grows out of the function of risk management for an enterprise. Risk management has two objectives:
 - 1. Conservation of existing enterprise assets despite surprise events.
 - 2. Realization of budgeted expectations despite surprise events.
 - G. The process of risk management involves systematic and continuous:
 - 1. Identification of significant exposures to loss
 - 2. Estimation of potential loss frequency and severity
 - 3. Identification of alternative methods to avoid loss
 - 4. Selection of a risk management method
 - 5. Monitoring execution of risk management plan
- III. The risk management process is both a philosophy of inquiry or analysis and a systematic management process which is attempting to answer "WHAT IF...?" questions, to anticipate surprise and to provide for a response or adjustment in advance of the contingency.
- A. Identification of significant exposures to loss can begin by using standard business documents as reminders, such as:
 - 1. Review of balance sheet accounts
 - 2. Review of profit and loss statement accounts
 - 3. Review of business organization or function chart
 - 4. Review of elements of financial feasibility analysis

- B. Significant has to do with potential loss frequency, loss severity, and degree of uncertainty.
1. Very frequent and minor become expense accounts
 2. Less frequent but predictable and major become reserves or budget allowances.
 3. Infrequent, uncertain but very severe become issues of risk management.
 4. A 50/50 probability is the most uncertain outcome.
- C. The alternative methods of avoiding loss which everyone subconsciously uses include:
1. Eliminate risk exposure
 2. Reduce frequency or severity of loss (mortgage loan closing process)
 3. Combine risks to increase predictability (reserves for expenses)
 4. Shift risk by contract (subcontracts or escape clauses)
 5. Shift risk by combination by contract (insurance)
 6. Limit maximum loss (corporate shell or limited partnership)
 7. Hedging (sale and lease-back, options, contingent sales)
- D. Selection of a risk management method depends on whether you are talking about a dynamic or static risk and the trade practices of a particular industry or business type.
1. A lease is a risk management contract.
 2. A pool plan syndication is risk management through combination.
 3. Some selections can be mathematical or statistical and others must be entrepreneurial.
- E. Real estate operations and management can become very complex risk management systems and the problem for the decision maker is to monitor the current progress of all the little details necessary for the execution of a risk management plan.
1. Some of these details are financial and that is primarily what we are talking about today. I am suggesting the theory of management and suggesting how data processing devices are beginning to make it possible to apply these theories in practice.
 2. We hope that the theory will have immediate practical application as you see relationships to your personal real estate problems but we also hope you will begin to see the trend of management theory as it begins to utilize the computer for better risk management.
 3. It should be noted that the principles are appropriate to any enterprise and not just real estate. Real estate education has been too quick to be inbred, to regard its problems as unique, rather than to relate to the evolution of management science in general.
 4. Management theory in the abstract simply represents a careful structuring of the common sense which you have successfully applied to your own business.

- IV. Real estate financial analysis involves the conversion of a product of space over time to flows of money over time from a real estate enterprise which involves both large amounts of capital and large amounts of managerial services.
- A. In forecasting the finance elements there is an infinite number of details so one must over-simplify by means of modeling and then determine the key assumptions which need to be made.
 - B. The purchase of any property and investment real estate in particular is the result of the decision maker "buying" a set of assumptions. A set of assumptions implies conditions of uncertainty--the possibility of variance--hence, risk.
 - C. Strategic format for developer-investor taking an active management role:
 - 1. Development role assumed (see attached mimeos)
 - 2. Major objective
 - 3. Key determinants of economic success
 - 4. Elements of cost/price relationship where developer has some control
 - 5. Elements of greatest variance or slippage
 - 6. Devices for minimizing maximum potential loss
 - 7. Devices for maximizing control
 - 8. Developer skills or personnel of critical importance
 - 9. Marginal components of cost/price/profit centers
 - D. Strategic format for the passive investor (i.e. mortgage lender)
 - 1. Pleasure, pain and bail-out theory of mortgage finance
 - 2. Incentives and the time line of financial events
 - 3. The ethical-aesthetic constraint for the lender
 - E. Basic elements of a real estate financial model which in turn identify the exposure for risk analysis might be as follows:
 - 1. Definition of desired profit centers
 - 2. Definition of a timeline over which events will still take place
 - 3. Assumptions on the capital budget and sequence of source and applications of funds.
 - a. Direct construction or purchase cost
 - b. Indirect and capitalized carrying cost
 - 4. Assumptions on operating budget and sequence of source and application.
 - a. Pattern of sales revenues
 - b. Pattern of operating expenses
 - 5. Financial plan
 - a. Credit amounts and terms
 - b. Equity amounts and terms
 - c. Holding power
 - 6. Profits classified as to type and tax
 - a. Cash from operations
 - b. Cash from capital gains
 - c. Cash surplus from financing
 - d. Cash from tax savings on other income

7. Selected measures of profitability
 - a. Definition of investment
 - b. Definition of profit
 - c. Selected ratios of profit to investment
 8. Selected measures of risk
 - a. Payback periods
 - b. Capacity for variance
 - c. Variance controls
- F. Control of time line risks in financial projections can be handled in a variety of ways or models which may or may not serve the client's purposes.
1. The classic appraisal assumes a project has moved on the time line to completion and normal operation as of the date of the appraisal. This may be appropriate to the permanent loan position.
 2. What if major profit centers occur before closing permanent loan?
 3. What if tax shelter expires before loan ratio reaches 75-80%?
 4. Interfacing of temporary and permanent loans may be stabilized with interim loans of 3-5 years, gap loans, or conditional debt such as limited partnership or accessible stock.
- V. Current Trends and Risk Management Affecting Real Estate
- A. Control of marketing risk through market research of special consumer groups and their motivations to create monopoly.
 - B. Control of discretionary expenses by motivation of professional managers through contracts with incentive compensation formulas.
 - C. Public control of new land development plus control of auto transit means recycling of intown sites.
 - D. Energy crisis will redefine linkages to utilities regionally as well as locally.
 - E. Energy crisis will mean redefinition of the auto and all auto dependent forms of land use.
 - F. Energy crisis will alter expensive character of current leisure
 - G. As real estate becomes recognized as a service product, fee ownership declines in significance.
 - H. Trend toward condominium and homeowners association means success of hardware is tied directly to success of group organization software.

Dr. James A. Graaskamp, associate professor of Real Estate, University of Wisconsin, addressed students, faculty, and members of the community at Northern Illinois University on March 14, 1973.

CHANGING CONCEPTS OF REAL ESTATE INVESTMENT STRATEGY

James A. Graaskamp
School of Business
University of Wisconsin
Madison, Wisconsin

Real estate investment currently has great popular appeal, but investor understanding of the opportunity is confused by both mythology about wealth through real estate and by many obsolete theories as to value. In one sense, real estate is the classic interfacing of land, labor, capital, and management. The product is artificially differentiated space over time. It is described as an apartment per month, a room for a night, a square foot of office per year, or even a recreational second home condominium apartment on Lake Tahoe with the right to use in January, June, and September, while three other families enjoy it during other three-month periods. While the product is space-time, it is not to be confused with the business of real estate which is money over time. As in any enterprise, the business of real estate is concerned with the cash cycle and the cash cycle can be shown to have significantly different value investment implications than the principles of the traditional land.

The cash cycle forecasting problem for the real estate business is converting space over time to money over time. The investor in an equity position, as opposed to a creditor position,

seldom has any contractual specification as to cost, profit dollar or timing of receipts and outlays. He must supply all of the numbers and dates inherent in a bond or mortgage contract by creating a set of assumptions. Thus, when he invests in a real estate enterprise, he is not actually purchasing ground and brick and mortar but rather he is "buying" a set of financial assumptions about the cash cycle of the real estate enterprise. The risk of such an investment is the potential variance between the assumptions in forecasting a pro forma cash cycle and realization of an actual cash cycle. Analysis requires identification of the most significant points of potential variance and selection of risk management methods to control variance.

While potential changes in operating expense can be shifted to the tenant by increasing rents or providing escalator clauses in long term leases and construction costs can be controlled in part through design and bidding, the most significant variance or risk in real estate investment is not inherent in the space-time product. Rather, the risk is in the social context in which that space product must function. Thus, the economics of the real estate firm are those of a firm operating on a non-price theory of economics or perhaps that of cash profit optimization within a complex web of institutional constraints.

The layman tends to view real estate as a static, solid and tangible vehicle for long term investment because the land doesn't move and the structure appears permanent. However, the nature of ownership as well as the utility of the product is a function of the

interface between population trends, culture, and technology and these elements are changing at an accelerating rate. Moreover, the decision systems relative to land, labor, capital, and management are changing on the supply side. The result is that the apparent static and stable real estate suffers from obsolescence at an accelerating rate because it is immobile, inflexible in use, too durable for the use intended, and thus shopworn relative to its market in the future. Therefore, its revenue stream is unpredictable at best over the period of time necessary to recover the mortgage lender's investment.

Changing lifestyles affect both the type of facility and the locational preferences of population to quickly alter the nature of demand. The rate at which demand characteristics shift is accelerated or reduced artificially by the effective demand caused by income allocation within the society and the ability to pay relative to the cost to construct. The result may be that premium properties may filter down to groups with less effective demand and therefore with relatively lower price structures more quickly. As the transience of people relative to place and objects increases, the long term stability of real estate as an investment decreases since value is a direct function of cultural preferences.

Perhaps the most dramatic shift as a result of growing cultural sophistication is the awareness of land as a finite natural resource and a public utility rather than a private commodity. As a result, society is attempting to reimpose controls on the use of land

by an exponential increase in the use of police powers and condemnation as well as internalizing public cost through real estate taxes and special assessment. Creation of wealth through the conversion of raw land to more intensive urban use becomes a very high risk political adventure so that land itself has significantly less appeal for the passive investor than recent history would suggest that it might. Land use decisions more and more will reflect opportunity costs to society in the aggregate rather than the consumer surplus created for entrepreneur and a small group of site users, be they tenants or owners of one form or another. Once again, forecasting is difficult even for the short term which is incompatible with long term investment.

If trends on the demand side and the supply side make long term investment in capital improvements difficult business at best, then wealth through real estate must lie in entrepreneurial ability. What is left to manage to investment advantage if operating costs, real estate taxes, and debt service have absorbed the bulk of receipts? Where is the cash return for the equity position? Ironically, much of the profit of real estate is found in the expenses or outlays and in the income tax savings as the result of taxable losses. Each real estate enterprise involves huge outlays for the purchase of land, construction services, management services, and supplies of all kinds, and these outlays are revenues to other enterprises. Control of the real estate project provides a captive buyer for services of a land speculator, general contractor,

engineer-architect, insurance agent, mortgage bankers and property manager. Thus, ownership can be defined as the degree to which one can divert the outlays to a captive supplier of these services. Most of the profit centers are found in the outlays which characterize traditional valuation methods. Unless one can view a consolidated profit and loss statement on a cash basis for all the enterprises involved in a real estate endeavor, there is no accurate way of viewing the investment return on the project.

By viewing real estate as a set of related cash flow enterprises and ownership as the creative manipulation of these cash flows in the relatively short run, the conclusion must be that the passive investor is at great disadvantage to the creative developer so far as investment return is concerned. The passive money investor is either supplying risk capital to create a new enterprise or he is actually in the position of a subordinate creditor. Viewed from the standpoint of control and priority of claim on cash flow, the limited partner in a real estate syndicate is actually in a position of a second mortgage revenue bond holder who not only bought a contingent interest in real estate as a speculation but purchased the present value of his future losses as well!

Seminar - BUYING INVESTMENT PROPERTY
Sponsored By
University of Wisconsin Extension-Green Bay
Thursday, January 29 & Friday, January 30, 1981
Holiday Acres Resort, Rhinelander

Instructors:

Prof. James Graaskamp	Mr. Julius Dinger
School of Business	Julius Dinger Real Estate
UW-Madison	P.O. Box 1127
1155 Observatory Drive	Eau Claire, WI 54701
Madison, WI 53706	

Session #1: Thursday Morning (Graaskamp)

- 9:00-9:50 A. An Investment Check List For the 1980's
- 10:00-10:50 B. Nature and Segmentation of Northern Wisconsin Recreational Market
1. Recreational home
 2. Recreational development
 3. Restaurants and commercial property
 4. Motels and resorts
 5. Marinas
- 11:00-11:50 C. Regional Problems of Northern Wisconsin
1. Access systems
 2. Energy impacts
 3. Competitive alternatives
 4. Education/recreation

LUNCH

Session #2: Thursday Afternoon (Dinger)

- 1:00-1:50 A. Recreational Land Selection
- 2:00-2:50 B. Second Homes and Seasonal Cottages
- 3:00-3:50 C. Land Use Regulations and the Seasonal Home

(All sessions feature question and answer formats for at least 25% of the time allotted)

Session #3: Friday Morning (Graaskamp) (*missing*)

- 9:00-9:50 A. The Restaurant Formula - (A financial feat to provide a taste treat for palates trained to like bland)
- 10:00-10:50 B. Setting up a Pro Forma on a Small Motel
- 11:00-11:50 C. Some Case Examples in Northern Wisconsin (Dinger)

LUNCH

Session #4: Friday Afternoon (Dinger & Graaskamp)

- 1:00-1:50 A. A Pro Forma of Land Cost and Carry Projections (Some good and bad examples)
- 2:00-2:50 B. Marinas and Water Sports
- 3:00-3:50 C. Investment Syndication and Joint Ventures in Wisconsin in the 80's - Think Small (Graaskamp) (*Missing*)

BUYING INVESTMENT PROPERTY IN NORTHERN WISCONSIN:
A STRATEGY FOR THE 1980'S

A Seminar Sponsored by

University of Wisconsin Extension-Green Bay
Thursday, January 29 & Friday, January 30, 1981
Holiday Acres Resort, Rhinelander

SESSION NO. 1

INVESTMENT GUIDELINES AND ENVIRONMENT

- I. An investment program should begin with "Know Thyself" - specifically, attitudes about the future, a profile of constraints in the search for opportunities, and then some decision rules for ranking choices.
 - A. There are many long-term trends and future possibilities about which we can do very little as investors
 1. Systematic versus specific risks in the stock market - the beta factor - random selection for diversity
 2. Location, money market, and marketing risks in real estate
 3. Given personal or instinctive judgments we position ourselves for future change
 - B. Long-term factors for which we should have controlling attitudes
 1. Capital shy economy in which all major problems require capital intensive solutions
 - a. Short fall in savings
 - b. Selective credit assignments
 - c. Continued high interests
 2. Inflation since government investment may be a faster response, (deficit budgets), import-export deficit, deliberate tax on savers to transfer wealth to doers, necessity of funding pension and income stabilization
 3. Deflation of consumer discretionary income through forced saving, higher food and shelter prices, and transition to energy efficient systems
 4. Energy problems during transition to alternative
 5. Shifting demographics to younger families and retirement families
 6. Shifting tax laws
- II. Any investor or investment board must define certain limits which profile the nature of an investment opportunity
 - A. Degree of exposure to political risk
 1. Level #1 - All manner of land use control law
 2. Level #2 - Vulnerability to political control of effective demand (tax deductions for second homes, alteration of public transportation subsidies, etc.)
 3. Level #3 - Political subsidy of competitive supply

- B. Degree of "channelled demand"
 - 1. Identity of interest between user and investor
 - 2. Reciprocity
 - 3. Tie-in contracts
 - 4. Careful research of market segmentation
- C. Degree of management intensiveness
 - 1. Dependency on a unique personality or talent
 - 2. Dependency on high technology levels and skills
 - 3. Short-term, high turnover tenancy tied to service rather than location
 - 4. Lack of product differentiation requires constant development of advertising differentiation
- D. Financial parameters
 - 1. Maximum cash for down payments
 - 2. Maximum cash for holding power
 - 3. Minimum time horizon for cash income
 - 4. Need for diversification
 - 5. Tolerance for risk
- E. Sequence of decision points
 - 1. Cost of aborting before closing
 - 2. Minimum cost escape route
 - 3. Liquidity through sale
- F. Income tax parameters and objectives
 - 1. Acquisition factors
 - 2. Operations
 - 3. Disposition
 - 4. Special benefits
- G. Estate planning considerations
 - 1. Accumulation
 - 2. Distribution and allocation
 - 3. Liquidity for estate taxes
 - 4. Structuring for administrative efficiency and safety

III. In the real estate industry attitudes which are shared and profiles which are sketched by conventional wisdom soon lead to a rationale for investment which may or may not be well thought out

- A. The rationale for apartment investment is based on inflation
 - 1. Rising rents increase slower than inflation rate but only 50% of expenses are rising, debt service is fixed
 - 2. Rising construction costs, land costs, and interest costs mean a housing shortage or higher rents
 - 3. Tax favoritism to current income, opportunity for wealth transfer, and tax deferral
 - 4. Higher selling price due to higher rents, higher gross rent multipliers, and lower investor income expectations in anticipation of capital gains
 - 5. Opportunity to sell wholesale as an investment property or retail as a condominium
- B. Dangers to implicit assumptions of apartment rationale
 - 1. Rent increases will be unacceptable so income in value won't rise. Suitability for condominium conversion provides an escape

2. Inflation has wiped out or reduced real income of the average American family. Only the whitecollar self-employed and major union in large industries have been able to protect themselves and therefore, you need to avoid building with blue-collar and elderly tenancies.
3. Since many consumer items are competing with rent paying ability such as food, auto expense and medical expense, it is important to position the investment where shelter is in short supply and a high priority consumption item. Population growth areas in the South and West may meet these requirements where you have an immigration of white-collar younger groups.
4. Long-term inflation causes rising interest rates, rising constants and therefore, lower prices and more equity. Lender must turn to variable rate mortgages, balloon payments, short-terms. Try to buy apartments with assumable mortgages, wrap-arounds, or pay slightly higher rates for fixed dollar mortgages.
5. Run away inflation from loss of political will leads to short paybacks, exculpatory clauses and aggressive upgrading of rents for old and new tenants. The operating expense pass through provision has already appeared.

REAL ESTATE INVESTMENT SEMINAR

OSTENDORF-MORRIS
Cleveland, Ohio

November 6-7, 1981

Presented by: Prof. James A. Graaskamp, Ph.D. CRE, SREA
University of Wisconsin

Friday, November 6

10:00 A.M. Session #1 - Changing Investor Motivations and Strategies

11:00 A.M. Session #2 - Real Estate Dynamics and Changing Perception
of Ownership

LUNCH

1:00 P.M. Session #3 - Basic Financial Analysis for Investment Property

2:00 P.M. Session #4 - Investment Analysis and Risk Management

3:00 P.M. Session #5 - Real Estate Lease Analysis - Risk Management
Viewpoint

4:00 P.M. Session #6 - Basic Tax Ploys and the 1981 Tax Law

Saturday, November 7

****** 9:00 A.M. Session #7 - Advanced Income Forecasting Considerations *Outline plus
some exhibits*

10:00 A.M. Session #8 - Civil Rights and Social Factors For Corporate
Real Estate

****** 11:00 A.M. Session #9 - Real Estate Investment Broker As Investment
Counselor - *Outline only*

II. Real Estate Revenue Versus Service Revenue

A. The definition of economic rent attributable to the real estate

1. Is income attributable to entitlements that go with fee simple title to the land and are point specific or to transportable permits?
 - a. For example - does liquor license go with the building?
Is permit to build or maintain a dam assignable? Does right to management fee and brokerage fee go with general partnership or property?
2. Is the real estate income from retailing of space or from wholesaling space?
 - a. Parking ramp lease versus parking space by the hour, observation deck versus ticket, condominium conversion fee versus apartment project investment.
3. Is the income for extraordinary services or intangible assets rather than customary real estate space and services?
 - a. Maid service versus janitorial, shopping center premium for proximity or for joint merchandising and risk management.
4. Ancillary to rather than integral with the project.
 - a. Can services be acquired off premises such as janitorial or utilities?
5. IRS classification as 1250 property (real) or 1231 property (personalty) or Section 38 (tangible) or Section (intangible).
6. Is income attributable to governmental agencies in exchange for contractual entitlements of control or use to the public interest for the term of the contract?

B. Problem of defining or forecasting a reversion

1. Pricing real estate for utilitarian purpose, to buy access to service sales, or speculate in long term demand/supply commodity relationships of long term commodity/money ratios.
2. Can the appraiser prove presence of necessary conditions for appreciation and amount of depreciation?
 - a. Rising net income
 - b. Falling interest rates
 - c. Falling investor expectations

CASE STUDY - EXHIBITS 4-29 - SEMINAR

LIST OF EXHIBITS

	Page
1 Location of Subject Site Relative to the Capitol Square.	2
2 Subject Site in Original Madison Plat.	8
3 Site Plan of Subject Property.	10
4 Proposed Capitol Concourse Plan.	15
5 Proposed Parking for Concourse Plan.	16
6 Traffic Patterns and Public Parking Upon Completion of Capitol Concourse.	18
7 View from the East Main Office Entrance of the Subject Property	22
8 Photographs of Subject Property.	25
9 Location of First Floor Retail Vacancies on the Capitol Square	32
10 First Floor Retail Vacancies on the Square Existing or Known to be Available as of January 1, 1980.	33
11 Madison Downtown Office Space as of January 1, 1980.	35
12 Expression of State's Interest in Post Office Building-- Wisconsin State Journal Article.	37
13 Location of Comparable Sales on or Near Capitol Square	40
14 Comparable #1 - 30 West Mifflin.	41
15 Comparable #2 - 50 East Mifflin.	43
16 Comparable #3 - 16 North Carroll	45
17 Comparable #4 - 123 West Washington.	46
18 Comparable #5 - 102 and 110 North Hamilton	48
19 Comparable #6 - 212 East Washington.	50
20 Comparable #7 - 2 West Mifflin	51
21 Scale for Scoring Comparables on Important Investor Considerations	54
22 Weighted Matrix for Comparable Properties.	55
23 Calculation of Most Probable Price Using Mean Price Per Point Equation Method.	57

LIST OF EXHIBITS -- Continued

	Page
24 Schedule of Rental Revenues for the Period of April 30, 1980 Through April 29, 1985	62
25 Schedule of Vacancies by Floor and By Lease Terms for the Period of April 30, 1980 Through April 29, 1985.	68
26 Average Rate of Increase in Consumer Price Index - All Items May 1975 Through April 1980	75
27 Schedule of Projected Revenues and Expenses from April 30, 1980 Through April 29, 1985	77
28 Revenue Justified Capital Budget - Debt Cover Ratio Approach	82
29 MRCAP Input and Output--Justified Capital Budget with Real Estate Taxes at 5.4% of First Year's Gross Rent	86
30 Sources of Comparable Land Sales from 1973-1980 in Madison, Wisconsin	94
31 Location of Comparable Class B Office Sites in Odana Area	96
32 Analysis of Comparable Land Sales	97
33 BFCF Test of Justified Land Cost.	105

WEIGHTED MATRIX FOR COMPARABLE PROPERTIES

FEATURE/ WEIGHT	Rating/Weighted Rating						Subject 110 E. Main
	#1 30 W. Hifflin	#2 50 E. Hifflin	#3 16 N. Carroll	#4 123 W. Washington	#5 102 N. Hamilton	#6 212 E. Washington	
Parking 25%	5/1.25	3/.75	0/0	0/0	3/.75	3/.75	3/.75
Location 20%	5/1.00	5/1.00	5/1.00	3/.60	1/.20	3/.60	3/.60
First Floor Retail Lease In Place 15%	5/.75	5/.75	0/0	3/.45	3/.45	0/0	1/.15
Need for Renovation 15%	5/.75	1/.15	3/.45	5/.75	1/.15	1/.15	3/.45
Visual Quality of Office Entrance 10%	5/.50	3/.30	3/.30	5/.50	3/.30	3/.30	1/.10
Vacancies in Existing Office Space 15%	5/.75	0/0	5/.75	5/.75	0/0	0/0	1/.15
Total Weighted Score	5.00	2.95	2.50	3.05	1.85	1.80	2.20
Selling Price	\$2,555,500	\$850,000	\$615,270	\$2,896,000	\$330,000	\$472,000	X
Total Net Rentable Area (NRA)	65,000 sq. ft.	38,500 sq. ft.	35,725 sq. ft.	138,000 sq. ft.	28,000 sq. ft.	38,000 sq. ft.	74,000 sq. ft.
Price Per Square Foot (NRA)	\$39.30	\$22.10	\$17.20	\$21.00	\$11.80	\$12.40	
Price Per Square Foot of NRA	7.86	7.49	6.88	6.89	6.38	6.89	
Total Weighted Score							

EXHIBIT 23

CALCULATION OF MOST PROBABLE PRICE USING MEAN PRICE PER POINT EQUATION METHOD

Comparable Property	Selling Price/ per NRA	Point Score	Price per NRA per Total Weighted Score (x)
1	\$39.30	5.00	7.86
2	22.10	3.45	7.49
3	17.20	2.50	6.88
4	21.00	3.05	6.89
5	11.80	1.85	6.38
6	12.40	1.80	6.89
TOTAL			42.39

$$\text{Mean Value } (\bar{x}) = 42.39 \div 6 = 7.07$$

$$\text{Standard Deviation} = \frac{\sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}}{\sqrt{n}} = .214$$

where:

x	$\bar{x}$	$(x - \bar{x})$	$\sum (x - \bar{x})^2$	n	n-1
7.86	7.07	.79	.62	6	5
7.49	7.07	.42	.18		
6.88	7.07	.19	.04		
6.89	7.07	.18	.03		
6.38	7.07	.69	.48		
6.89	7.07	.18	.03		
			1.38		

$$\text{Value Range: } 7.07 \pm .21$$

$$\text{High Estimate: } 7.28 = (X/74,000^1 \text{ sq. ft.}) \div 2.2^2, \therefore X = 1,185,184 \text{ or } \$1,200,000$$

$$\text{Central Tendency: } 7.07 = (X/74,000 \text{ sq. ft.}) \div 2.2, \therefore X = 1,150,996 \text{ or } \$1,150,000$$

$$\text{Low Estimate: } 6.86 = (X/74,000 \text{ sq. ft.}) \div 2.2, \therefore X = 1,116,808 \text{ or } \$1,120,000$$

¹74,000 sq. ft. = NRA of subject property

²2.2 = Weighted point score for subject property

Session #7 - Introduction

- I. It is generally recognized that the real estate market is dependent on substantial amounts of credit to support effective demand so that real estate prices and perhaps values vary with the terms and supply of credit generally available in the marketplace. Indeed the old timers have seen the definition of fair market value gradually move away from the firm premise of cash to the seller to a somewhat more subjective condition of terms generally available in the market.
 - A. The pressure of double digit inflation is eroding many of the appraisers' favorite simplifications of the market model:
 1. The long term fixed interest mortgage, amortized from property productivity is gone.
 2. The simple division of income between the mortgage and the equity component is smothered in participating mortgages, limited partnerships, convertible mortgages and seller financing.
 3. As the government had removed general subsidies to real estate finance such as regulation Q, it has made greater use of specific interest subsidies to selected special groups.
 4. Real estate markets must be defined not only in terms of use, age, income, but also access to capital.
 5. Moreover, most properties exist in a 3-tier market, utility to house an activity, commodity and money speculation, and as part of a going concern.
 6. The 3-tier market can be further subdivided by the nature of permits or other entitlements that are site specific and define risk of a vested or non-vested opportunity.
 - B. Volatile money market conditions and the widespread use of creative financing leave the appraiser in considerable difficulty in defining typical market terms, cash equivalent prices or the relationship of fair market price, most probable price, going concern value, contributory value, investment value, or liquidating value in event of delinquency and foreclosure.
 - C. The impact of financing in each situation requires that we go back to basics. The appraiser or his client must define:
 1. What is the function of the appraisal?
 2. Which rights are to be appraised? (Those that run with the establishment on the site, with the ownership position, or with fee simple title).
 3. Which definition of value is appropriate?
 4. How is productivity allocated to the agents of production?
 - D. Reference to Exhibit I

Schedule of Rental Revenues¹ for the Period of April 30, 1980 Through April 29, 1985

Occupancy as of April 30, 1980	Space Sq. Ft.	Annual Rent per Sq. Ft. ²	Lease Terms as of 4/30/80 ³	4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
Annualized Gross Rental Revenues								
EXHIBIT 24								
Lower Level & Roof								
B Level Vault-Vacant	700	3.00	--	\$ 2,100	\$ 2,100	\$ 2,270	\$ 2,270	\$ 2,450
B Level-Showroom & Office	4000	3.00	--	12,000	12,000	12,960	12,960	14,000
A Level-Storage	400	4.00	6/30/80	1,600	2,400	2,600	2,800	3,000
Honeywell Phone Box	--	--	--	600	600	600	650	650
Total-Lower Level	5100			\$16,300	\$17,100	\$18,430	\$18,680	\$20,100
First Floor								
Chez Vous-112	454	4.80	10/1/76 - 9/30/81	\$ 2,180	\$ 2,290	\$ 2,360	\$ 2,360	\$ 2,360
Chez Vous-114	1000	4.80	10/1/76 - 9/30/81	4,810	5,030	5,200	5,200	5,200
North Entry	2000	9.00	--	18,000	19,500	21,000	22,500	24,000
South Entry-Leaf & Ladle ⁴	3500	9.00	1/1/80 - 12/30/84	31,500	33,130	33,950	36,670	39,600
Total-First Floor	6954			\$56,490	\$59,950	\$62,510	\$66,730	\$71,160
Second Floor								
201 Vacant	150	6.50	--	\$ 970	\$ 970	\$ 1,050	\$ 1,050	\$ 1,140
202 State ⁵	600	6.70	7/1/79 - 6/30/80	4,020	4,320	4,320	4,670	4,670
203-4 Vacant ⁵	543	6.20	9/1/78 - 8/31/79	3,370	3,640	3,640	3,640	3,930
205-6 State	506	7.00	3/1/78 - 5/31/80	3,540	3,820	3,820	4,120	4,120
207-8 Homecrafts	386	7.20	1/1/79 - 12/31/81	2,780	2,850	3,000	3,000	3,080
209-10 State ⁵	451	6.25	11/1/79 - 5/31/80	2,820	3,040	3,040	3,280	3,280
211 Dr. Regez	219	7.00	--	1,600	1,730	1,730	1,870	1,870
212-14 Dr. Wierwill	700	6.50	4/1/78 - 3/31/81	4,570	4,900	4,900	4,900	5,210
215 Vacant	415	6.75	7/1/78 - 6/30/79	2,800	3,020	3,020	3,270	3,270
216 UPI	500	7.50	5/1/80 - 4/30/81	3,750	4,050	4,050	4,370	4,370
218-19 Rape Crisis Center	816	7.00	1/1/80 - 12/31/81	5,840	6,120	6,260	6,530	6,690
220-21 State ⁵	1400	6.25	12/1/79 - 5/31/80	8,750	9,450	9,450	10,200	10,200
Total-Second Floor	6686			\$44,810	\$47,910	\$48,280	\$50,900	\$51,830

EXHIBIT 24

Schedule of Rental Revenues¹ for the Period of April 30, 1980 Through April 29, 1985

Occupancy as of April 30, 1980	Space Sq. Ft.	Annual Rent per Sq. Ft. ²	Lease Terms as of 4/30/80 ³	Annualized Gross Rental Revenues				
				4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
Third Floor								
301 Vacant	150	5.75	--	\$ 860	\$ 860	\$ 930	\$ 930	\$ 1,000
302-3 State ⁵	1179	5.75	--	6,780	7,320	7,320	7,900	7,900
304 State ⁵	230	6.70	--	1,540	1,660	1,660	1,800	1,800
305-8 State ⁵	942	6.70	--	6,300	6,800	6,800	7,360	7,360
309 The Journal Co.	232	7.20	9/1/79 - 8/31/80	1,810	1,880	1,970	2,030	2,120
310-11 State ⁵	456	6.70	--	3,050	3,300	3,300	3,560	3,560
312 Vacant	234	5.75	--	1,340	1,450	1,450	1,570	1,570
313-14 Dr. R. Meng	482	7.20	6/1/79 - 5/31/80	3,490	3,730	3,750	4,000	4,030
315 Vacant	731	6.70	10/1/79 - 9/30/80	5,000	5,080	5,310	5,480	5,630
316-19 Wisc. Builders Assoc.	1091	7.00	1/1/80 - 12/31/80	7,810	8,180	8,360	8,730	8,940
320-24 Vacant	1363	7.00	--	9,540	10,300	10,300	11,130	11,130
Total-Third Floor	7090			\$47,520	\$50,560	\$51,150	\$54,490	\$55,040
Fourth Floor								
401 Vacant	150	6.40	--	\$ 960	\$ 960	\$ 1,040	\$ 1,040	\$ 1,120
402 Furst, Carlson Inc.	648	6.40	5/1/79 - 4/30/80	4,350	4,370	4,700	4,730	5,090
403-11 State	2147	6.75	1/1/80 - 12/31/81	14,500	14,880	15,670	16,100	16,960
412 Vacant	202	6.40	--	1,290	1,290	1,400	1,400	1,500
413-14 Wisconsin Alliance of Cities	679	6.80	--	4,980	5,020	5,420	5,420	5,850
415 State ⁵	259	7.00	3/1/79 - 2/28/81	1,830	1,940	1,970	2,100	2,130
416-19 State ⁵	1370	6.00	vacated 6/30/80	8,220	8,880	8,880	9,590	9,590
420-20a State ⁵	560	6.70	vacated 6/30/80	3,750	3,750	4,050	4,050	4,370
421-22 State	300	6.70	vacated 6/30/80	2,010	2,010	2,170	2,170	2,340
423-24 Ed Konkol	340	6.60	9/1/79 - 8/31/80	2,240	2,240	2,420	2,420	2,620
Total-Fourth Floor	6655			\$44,130	\$45,340	\$47,720	\$49,020	\$51,570

EXHIBIT 24 -- Continued

Schedule of Rental Revenues¹ for the Period of April 30, 1980 Through April 29, 1985

Occupancy as of April 30, 1980	Space Sq. Ft.	Annual Rent per Sq. Ft. ²	Lease Terms as of 4/30/80 ³	4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
Fifth Floor								
501 E. C. Barton	150	7.60	--	\$ 1,240	\$ 1,270	\$ 1,270	\$ 1,380	\$ 1,380
502 Vacant	842	7.50	--	6,310	6,820	6,820	7,360	7,360
503-5 Vacant	810	7.50	--	6,070	6,070	6,440	6,800	6,800
506-19 State	3922	6.25	11/1/79 - 10/31/83	24,500	24,500	24,500	30,590	31,770
520 State-Bd. of Aging	555	6.70	7/1/79 - 6/30/81	3,950	4,000	4,270	4,330	4,940
521-22 Dr. Coryell	339	7.20	7/1/79 - 6/30/80	2,440	2,690	2,740	2,920	2,950
523-24 Green Bay Press Gazette	337	7.60	9/1/79 - 8/31/82	2,560	2,690	2,760	2,760	2,760
Total-Fifth Floor	6955			\$47,070	\$48,040	\$48,800	\$56,140	\$57,960
Sixth Floor								
601 Vacant	150	6.70	--	\$ 1,000	\$ 1,000	\$ 1,080	\$ 1,080	\$ 1,170
602-4 State ⁵	1473	6.00	vacated 6/30/80	8,840	9,540	9,540	10,300	10,300
605 Vacant	204	6.40	--	1,300	1,300	1,410	1,410	1,520
			to 6/30/80					
606-10 State	1000	6.70	then mo. - mo.	7,370	7,500	7,500	8,100	8,100
611 The Evjue Foundation	286	7.00	vacated 11/30/80	2,000	2,000	2,160	2,160	2,330
612-14 State	647	7.50	11/1/79 - 10/31/83	4,850	4,850	4,850	5,080	5,240
615 Tenney Bldg.	344	7.00	--	2,400	2,400	2,600	2,600	2,800
616 John Barsness	850	6.00	3/1/79 - 2/28/81	5,170	5,520	5,590	5,950	6,020
617 Bill Ward	250	6.70	vacated 5/31/80	1,940	2,120	2,120	2,300	2,300
618-19 State	494	8.00	vacated 5/31/79	3,950	3,950	4,270	4,270	4,610
620-24 Vacant	1262	6.70	--	8,450	9,130	9,130	9,860	9,860
Total-Sixth Floor	6960			\$47,270	\$49,310	\$50,250	\$53,110	\$54,250
Seventh Floor								
701 Lawton & Cates	150	5.75	6/1/79 - 5/31/83	\$ 930	\$ 970	\$ 1,100	\$ 1,050	\$ 1,090
702-19 Lawton & Cates	5417	5.75	6/1/79 - 5/31/83	33,600	35,100	36,450	37,850	39,160
720-24 Vacant	1106	7.00	--	7,740	7,740	8,360	8,360	9,030
Total-Seventh Floor	6673			\$42,270	\$43,810	\$45,910	\$47,260	\$49,280

EXHIBIT 24 -- Continued

Schedule of Rental Revenues¹ for the Period of April 30, 1980 Through April 29, 1985

Occupancy as of April 30, 1980	Space Sq. Ft.	Annual Rent per Sq. Ft. ²	Lease Terms as of 4/30/80 ³	Annualized Gross Rental Revenues				
				4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
Eighth Floor								
801 Wisconsin Radio News	150	7.00	to 6/30/80	\$ 1,050	\$ 1,050	\$ 1,130	\$ 1,130	\$ 1,220
802-5 State	1536	7.55	to 10/31/83	11,600	11,600	11,600	12,060	12,520
806-7 Dr. Mannis	470	7.50	9/1/79 - 8/31/80	3,840	4,000	4,000	4,210	4,320
808-22 State	4580	6.00	7/1/79 - 6/30/80	27,480	36,620	37,100	37,100	39,580
823-24 Dr. Boyle	339	7.60	9/1/79 - 8/31/80	2,780	2,880	3,040	3,120	3,120
Total-Eighth Floor	7075			\$46,750	\$56,150	\$56,870	\$57,620	\$60,760
Ninth Floor								
901 Millman & Robertson	150	8.00	1/1/80 - 12/31/80	\$ 1,230	\$ 1,300	\$ 1,340	\$ 1,400	\$ 1,400
902 Wisc. Ins. Alliance	864	7.00	6/1/79 - 5/31/80	6,400	6,480	6,910	7,000	7,000
903-6 Mulcahy & Wherry	980	8.00	1/1/79 - 12/31/81	8,070	8,530	8,750	9,210	9,210
907 Robert Uehling	225	8.00	4/1/80 - 3/31/81	1,810	1,960	1,980	2,110	2,110
909-10 Larry Hall	700	6.00	6/1/79 - 5/31/80	4,520	4,550	4,870	4,900	4,900
911 Dr. Schmitz	248	7.75	1/1/79 - 12/31/80	1,920	1,970	2,060	2,140	2,230
912-19 Devine Insurance	2580	7.00	4/1/80 - 3/31/83	18,060	18,060	18,180	19,350	19,350
921 State	575	7.00	vacated 7/1/80	4,020	4,350	4,350	4,700	4,700
922-23 Judicial Commission	355	6.50	5/1/79 - 4/30/81	2,300	2,500	2,500	2,700	2,700
924-25 Dr. Rundell	339	7.20	6/1/79 - 5/31/80	2,650	2,680	2,860	2,880	2,880
Total-Ninth Floor	7016			\$50,980	\$52,380	\$53,800	\$56,390	\$56,480
Tenth Floor								
1001 Victor Lind	150	6.80	11/1/79 - 10/31/80	\$ 1,050	\$ 1,200	\$ 1,250	\$ 1,300	\$ 1,350
1002 Wisc. Assoc. of Indep. Colleges	864	6.50	1/1/80 - 12/31/80	5,760	6,050	6,190	6,480	6,650
1003-4 Wisc. Cannery & Freezers	756	8.00	5/1/79 - 4/30/80	6,050	6,050	6,530	6,530	7,050
1005-8 Boelter Co.	911	6.80	12/1/79 - 11/30/80	6,370	6,650	6,880	7,200	7,400
1009-10 Vacant	455	6.50	--	2,950	3,190	3,190	3,450	3,450
1011-13 Dr. Doll	727	6.65	6/1/79 - 5/31/80	5,230	5,270	5,640	5,670	6,100
1014 Vacant	229	6.25	--	1,430	1,430	1,540	1,540	1,670
1015-18 State	1616	7.50	11/1/79 - 10/31/83	12,120	12,120	12,120	12,600	13,090
1019-21 Vacant	680	6.70	vacated 2/29/80	5,380	5,440	5,870	5,910	6,350
1022 Herb Walsh	171	8.00	12/1/79 - 11/30/80	1,420	1,490	1,490	1,540	1,600
1023-24 Dane Co. Advocate for Battered Women	331	7.20	8/1/79 - 7/31/80	2,610	2,680	2,840	2,900	3,070
Total-Tenth Floor	6890			\$50,370	\$51,570	\$53,540	\$55,120	\$57,780
Annual Totals for	74,054 sq. ft.			\$493,960	\$522,120	\$537,260	\$565,460	\$586,210

EXHIBIT 24 - Continued

EXHIBIT 24 -- Continued

Notes to Schedule of Rental Revenues for the
Period of April 30, 1980 Through April 29, 1985

¹The annualized gross rental revenue for the period from April 30, 1980 through April 29, 1981 is consistent with the actual lease terms, if at market rents, as of April 30, 1980. Increases in rents are assumed to take place according to lease terms and conditions; an increase of 8 percent is used at lease renewal dates. This factor was taken from a survey of office rent increases in Class B buildings on and near the Capitol Square in Madison and is the current rate used by the Tenney Building manager.

²The annual rental market rate is given as of April 30, 1980. Only one tenant in Rooms 909-10 is considered to be below market rent at \$4.73/square foot; therefore the rent for this space is calculated at a market rate of \$6.00/square foot. Market rents are also imputed to spaces used by the building owner.

³Of the 87 rental space units in the Tenney Building as of April 30, 1980, there are 62 leases in place, but 54 of those terminate between 1980 and 1982. Only eight have leases that extend beyond April 30, 1982.

⁴The Leaf and Ladle Restaurant began its lease of 3500 sq. ft. of the first floor retail space on January 1, 1980. The restaurant had closed its door by October 1, 1980, and the remodeled space is once again on the market. The rental rate of \$9.00 with an annual escalator of 8% per year commencing in the second year is considered comparable for the area. A most probable investor might consider an escalator based upon a percentage of gross sales to encourage rental of this space if restaurant use is most likely; the projected revenues probably would not increase as rapidly as forecast.

⁵The state has given notice that it will vacate these spaces by June 30, 1980.

Schedule of Vacancies by Floor and by Lease Terms for
the Period of April 30, 1980 Through April 29, 1985

	Space Sq. Ft. ²	% Vacant	Annual Rental Rate Per. Sq. Ft.	# of Months Vacant	Projection Period				
					4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
<u>Lower Level & Roof</u> ¹									
B Level - Vault	700	100	3.00	12	\$ 2,100				
	700	100	3.00	12		\$ 2,100			
	700	100	3.25	12			\$ 2,270		
	700	50	3.25	6				\$ 1,140	
	700	50	3.50	6					\$ 1,140
<u>B Level</u>									
Showroom and Office	4,000	100	3.00	12	12,000				
	4,000	100	3.00	6		6,000			
	4,000	50	3.25	6			3,250		
	4,000	50	3.25	6				3,250	
	4,000	50	3.50	3					1,750
<u>A Level - Storage</u>									
	400	100	7.00	6				1,400	
	400	100	7.50	9					2,250
Total - Lower Level					\$14,100	\$ 8,100	\$ 5,520	\$ 5,790	\$ 5,140
<u>First Floor</u>									
112 East Main	454	100	5.20	8		\$ 1,570			
	454	100	5.20	12			\$ 2,360		
	454	100	5.20	4				\$ 780	
114 East Main									
	1,000	100	5.20	8		3,480			
	1,000	50	5.20	12			2,600		
	1,000	50	5.20	4				860	
Leaf & Ladle									
	3,500	100	9.00	7	18,370				
	3,500	100	9.50	3		8,310			
	3,500	100	10.50	3				9,190	
	3,500	100	11.30	3					\$ 9,890
North Entry									
	2,000	100	9.00	9	13,500				
Total - First Floor					\$31,870	\$13,360	\$ 4,960	\$10,830	\$ 9,890

Schedule of Vacancies by Floor and by Lease Terms for
the Period of April 30, 1980 Through April 29, 1985

	Space Sq. Ft. ²	% Vacant	Annual Rental Rate Per Sq. Ft.	# of Months Vacant	Projection Period				
					4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
Second Floor ³									
201	150	100	6.50	12	\$ 900				
	150	100	6.50	12		\$ 900			
	150	100	7.00	12			\$ 1,050		
	150	100	7.00	12				\$ 1,050	
	150	100	7.60	12					\$ 1,140
202	600	100	6.70	6	2,010				
	600	50	7.20	12		2,160			
	600	50	7.20	12			2,160		
	600	50	7.80	6				1,170	
	600	50	7.80	3					580
203-4	543	100	6.20	12	3,370				
	543	50	6.70	12		1,820			
	543	50	6.70	12			1,820		
	543	50	6.70	9				1,360	
205-6	506	100	7.00	6	1,770				
	506	50	7.50	12		1,900			
	506	50	7.50	12			1,900		
	506	50	8.15	9				1,550	
	506	50	8.15	6					1,030
209-10	451	100	6.25	6	1,410				
	451	50	6.75	12		1,520			
	451	50	6.75	12			1,520		
	451	50	7.30	9				1,230	
215	415	100	6.75	12	2,800				
	415	100	7.30	6		1,510			
	415	100	7.30	3			760		
218-19	816	100	8.00	8				4,370	
	816	100	8.20	12					6,690
220-21	1,400	100	6.25	6	4,370				
	1,400	50	6.75	12		4,720			
	1,400	50	6.75	6			2,360		
	1,400	50	7.30	6				2,560	
Total - Second Floor					\$16,630	\$14,530	\$11,570	\$13,290	\$ 9,440

EXHIBIT 25 -- Continued

Schedule of Vacancies by Floor and by Lease Terms for
the Period of April 30, 1980 Through April 29, 1985

	Space Sq. Ft. ²	% Vacant	Annual Rental Rate Per Sq. Ft.	# of Months Vacant	Projection Period				
					4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
Third Floor ³									
301	150	100	5.75	12	\$ 860				
	150	100	5.75	12		\$ 860			
	150	100	6.20	12			\$ 930		
	150	100	6.20	12				\$ 930	
	150	100	6.70	12					\$ 1,000
302-3	1,179	100	5.75	6	3,390				
	1,179	50	6.20	12		3,650			
	1,179	50	6.20	12			3,650		
	1,179	50	6.70	6				3,950	
304	230	100	6.70	6	770				
	230	100	7.20	12		1,660			
	230	100	7.80	6					900
305-8	942	100	6.70	6	3,150				
	942	50	7.20	12		3,390			
	942	50	7.20	12			3,390		
	942	50	7.80	3					1,830
310-11	456	100	6.70	6	1,530				
	456	50	7.20	12		1,640			
	456	50	7.20	12			1,640		
312	234	100	5.75	12	1,340				
	234	100	6.20	12		1,450			
	234	100	6.20	12			1,450		
	234	100	6.70	12				1,570	
	234	100	6.70	12					1,570
315	731	100	6.70	4	1,610				
320-24	1,363	100	7.00	12	9,540				
	1,363	100	7.60	6		5,150			
Total - Third Floor					\$22,190	\$17,800	\$11,060	\$ 6,450	\$ 5,300

EXHIBIT 25 -- Continued

Schedule of Vacancies by Floor and by Lease Terms for
the Period of April 30, 1980 Through April 29, 1985

	Space Sq. Ft. ²	% Vacant	Annual Rental Rate Per Sq. Ft.	# of Months Vacant	Projection Period				
					4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
<u>Fourth Floor</u>									
401	150	100	6.40	12	\$ 960				
	150	100	6.40	12		\$ 960			
	150	100	6.90	12			\$ 1,040		
	150	100	6.90	12				\$ 1,040	
	150	100	7.45	12					\$ 1,120
412	202	100	6.40	12	1,290				
	202	100	6.40	12		1,290			
	202	100	6.90	12			1,400		
	202	100	6.90	12				1,400	
	202	100	7.40	12					1,500
416-19	1,370	100	6.00	6	4,110				
	1,370	50	6.50	12		4,450			
	1,370	50	6.50	12			4,450		
	1,370	50	7.00	12				4,800	
	1,370	50	7.00	6					2,400
420-20a	560	100	6.70	6	1,880				
	560	50	6.70	12		1,870			
	560	50	7.20	9			1,520		
Total - Fourth Floor					\$ 8,240	\$ 8,570	\$ 8,410	\$ 7,240	\$ 5,020
<u>Fifth Floor</u>									
502	842	100	7.50	12	\$ 6,310				
	842	50	8.00	12		\$ 3,410			
	842	50	8.00	12			\$ 3,410		
	842	50	8.75	6				\$ 3,410	
520	555	100	7.70	6			2,130		
	555	50	7.80	12				2,160	
	555	50	8.90	9					\$ 1,850
Total - Fifth Floor					\$ 6,310	\$ 3,410	\$ 5,540	\$ 5,570	\$ 1,850

EXHIBIT 25 -- Continued

Schedule of Vacancies by Floor and by Lease Terms for
the Period of April 30, 1980 Through April 29, 1985

	Space Sq. Ft. ²	% Vacant	Annual Rental Rate Per Sq. Ft.	# of Months Vacant	Projection Period				
					4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
<u>Sixth Floor</u>									
601	150	100	6.70	12	\$ 1,000				
	150	100	6.70	12		\$ 1,000			
	150	100	7.20	9			\$ 810		
602-4	1,473	100	6.00	6	4,420				
	1,473	50	6.50	12		4,770			
	1,473	50	6.50	12			4,770		
	1,473	50	7.00	9				\$ 3,870	
	1,473	50	7.00	6					\$ 2,580
605	204	100	6.40	12	1,300				
	204	100	6.40	12		1,300			
	204	100	6.90	12			1,410		
	204	100	6.90	9				1,060	
617	250	100	7.75	4	640				
620-24	1,262	100	6.70	12	8,450				
	1,262	100	7.20	6		4,540			
	1,262	100	7.20	6			4,540		
	1,262	50	7.80	9				3,690	
Total - Sixth Floor					\$15,810	\$11,610	\$11,530	\$ 8,620	\$ 2,580
<u>Seventh Floor</u>									
No Vacancies Projected									
<u>Eighth Floor</u>									
801	150	100	7.00	10	\$ 880				
	150	100	7.00	12		\$ 1,050			
	150	100	7.50	6			\$ 560		
Total - Eighth Floor					\$ 880	\$ 1,050	\$ 560	0	0

EXHIBIT 25 -- Continued

Schedule of Vacancies by Floor and by Lease Terms for
the Period of April 30, 1980 Through April 29, 1985

	Space Sq. Ft. ²	% Vacant	Annual Rental Rate Per Sq. Ft.	# of Months Vacant	Projection Period				
					4/30/80- 4/29/81	4/30/81- 4/29/82	4/30/82- 4/29/83	4/30/83- 4/29/84	4/30/84- 4/29/85
<u>Ninth Floor</u>									
909-10	700	100	6.50	6		\$ 2,280			
	700	100	7.00	6			\$ 2,440		
922-23	355	100	7.00	12			2,500		
	355	100	7.60	6				\$ 1,350	
Total - Ninth Floor					0	\$ 2,280	\$ 4,940	\$ 1,350	0
<u>Tenth Floor</u>									
1009-10	455	100	6.50	12	\$ 2,950				
	455	100	7.00	12		\$ 3,190			
	455	100	7.00	9			\$ 2,390		
1014	229	100	6.25	12	1,430				
	229	100	6.25	12		1,430			
	229	100	6.70	6				770	
1019-20	680	100	6.70	1	380				
Total - Tenth Floor					\$ 4,760	\$ 4,620	\$ 2,390	\$ 770	0
TENNEY BUILDING TOTALS ⁴					\$120,790	\$85,330	\$66,480	\$59,910	\$39,220

EXHIBIT 25 -- Continued

Notes to Schedule of Vacancies by Floor and by Lease Terms
For the Period of April 30, 1980 Through April 29, 1985

- ¹The lower level space has a continued record of vacancy; it is assumed that until the space is made more marketable by remodeling, rents will not keep pace with the market. Uses other than a showroom for the 4000 sq. ft. will need to be explored; subdividing the larger space for office space and/or storage space are possibilities.
- ²It is assumed that the smaller office spaces from 200-500 square feet will experience less overall vacancy than the larger spaces. There appears to be a trend toward several small independent businessmen sharing a common secretarial staff; some of the larger vacant suites could be remodeled for this type of use.
- ³The second and third floors have the greatest amount of vacancy due to the exodus of State tenants. By the end of June, 1980, the State's move alone will cause 44% of the second floor vacancies; the third floor will experience a vacancy rate of 39.5% due to loss of State tenants; the State related vacancy rates on the fourth and sixth floors will be 29% and 21% respectively. A most probable buyer will have to anticipate a large capital investment in 1980 to remodel and refurbish the Building to make it competitive in the Class B office market that already has a large supply of space available on and near the Square.
- ⁴Vacancies are assumed to gradually decrease between 1981 and 1983; a most probable buyer will institute a vigorous marketing program which will involve research of space needs in the area and remodeling which will be targeted to those needs.

Schedule of Projected Revenues and Expenses From
April 30, 1980 Through April 29, 1985

	<u>4/30/80- 4/29/81</u>	<u>4/30/81- 4/29/82</u>	<u>4/30/82- 4/29/83</u>	<u>4/30/83- 4/29/84</u>	<u>4/30/84- 4/29/85</u>
<u>Revenues:</u>					
Gross Income	\$493,960	\$522,120	\$537,260	\$565,460	\$586,210
Less: Vacancies	(120,790) (24.5%)	(85,330) (16.3%)	(66,480) (12.4%)	(59,910) (10.6%)	(39,220) (6.7%)
Effective Gross	<u>373,170</u>	<u>436,790</u>	<u>470,780</u>	<u>505,550</u>	<u>546,990</u>
Parking Rentals	<u>12,960</u>	<u>12,960</u>	<u>12,960</u>	<u>14,000</u>	<u>14,000</u>
Total Revenues	\$386,130	\$449,750	\$483,740	\$519,550	\$560,990
 <u>Expenses:</u> ¹					
77 Accounting & Legal	4,200	4,640	5,120	5,650	6,240
Building Security ²	21,840	24,100	26,620	29,390	32,440
Insurance	7,000	7,730	8,530	9,420	10,400
Maintenance ³	28,850	31,850	35,160	38,820	42,860
Wage & Salaries	60,000	66,240	73,130	80,730	89,130
Payroll Taxes	11,500	12,700	14,020	15,470	17,080
Repairs	14,880	16,430	18,130	20,020	22,100
Telephone	1,600	1,770	1,950	2,150	2,380
Utilities ⁴	90,600	101,470	107,560	114,380	122,020
Office Expenses ⁵	7,040	7,520	8,250	8,840	9,690
Management ⁶	22,390	26,320	27,540	30,280	32,570
Concourse Special Assessment	<u>2,360</u>	<u>2,410</u>	<u>2,630</u>	<u>2,550</u>	<u>2,480</u>
Total Operating Expenses Before R.E. Taxes ⁷	<u>(\$272,260)</u>	<u>(\$303,180)</u>	<u>(\$328,640)</u>	<u>(\$357,700)</u>	<u>(\$389,390)</u>
Net Operating Income Before R.E. Taxes	\$113,870	\$146,570	\$155,100	\$161,850	\$171,600
Real Estate Taxes ⁸	<u>(26,680)</u>	<u>(28,000)</u>	<u>(29,400)</u>	<u>(30,880)</u>	<u>(32,420)</u>
Net Operating Income	\$ 87,190	\$118,570	\$125,700	\$130,970	\$139,180

Notes to Schedule of Projected Revenues and Expenses
From April 30, 1980 Through April 29, 1985

¹Expenses

In general, expenses are projected to increase according to the average annual change of 10.4% in the All Item Consumer Price Index over the past five years. (See amended Exhibit 27).

²Building Security

Security personnel is hired from 10 P.M. to 6 A.M. on weekdays with 24 hour coverage on the weekends. The building is open to the public from 6 A.M. to 6 P.M. each weekday. The continuing problems created by the presence of bars and adult entertainment places across the street make this security protection mandatory.

³Maintenance

This account includes an elevator maintenance contract at \$9,060 a year.

⁴Utilities

At present the Tenney Building consumes approximately 55,000 to 70,000 gallons of No. 2 fuel oil per year depending upon the weather. The cost of fuel has increased as follows:

January 12, 1979	.43/gallon
October 1, 1979	.77/gallon
February 1, 1980	.95/gallon

In thirteen months the cost has risen 121%. Though the Tenney Building is converting to natural gas on its primary boiler, the cost of natural gas is also volatile. Over the past five years natural gas has had an average annual increase of 17.6% for the commercial time-of-use consumer, according to Milton Spiros, Madison Gas & Electric Co.

The installation of combination storm windows throughout the building should help to conserve fuel costs. To stabilize utility costs it is assumed management will place energy cost escalators in renewed leases; therefore in the pro forma income statement utility costs are escalated at 12 percent annually with 50 percent of the increase passed through to the tenant after year 2.

⁵Office expenses include rental of space in the Tenney Building for management operations.

⁶Management costs are computed as 6% of effective gross office revenue with 4% allowed for management and 2% for leasing commissions for space turnover.

Notes to Schedule of Projected Revenues and Expenses
From April 30, 1980 Through April 29, 1985

⁷Total operating expenses are calculated before including real estate taxes for ease in using the MRCAP discounted cash flow program.

⁸Real estate taxes are calculated as 5.4% of gross revenues in the first year and increased at 5% per annum thereafter. These calculations are based on the following fact and assumptions:

1. The assessed value as of 1/1/80 is \$1,200,000.
2. The mill rate is assumed to increase slightly (approximately 1%) after several years of decrease.
3. Taxes will continue to increase due to inflated city budgets and decreasing state aids.

end of the second year when the leases have been renegotiated.

4. Conversion of Net Income to Present Value

The MRCAP program from the National EDUCARE library of programs, previously described, is used to convert net income to a present value after taxes as of April 30, 1980, for the Tenney Building at the end of a five-year holding period.

C. Assumptions Used in MRCAP

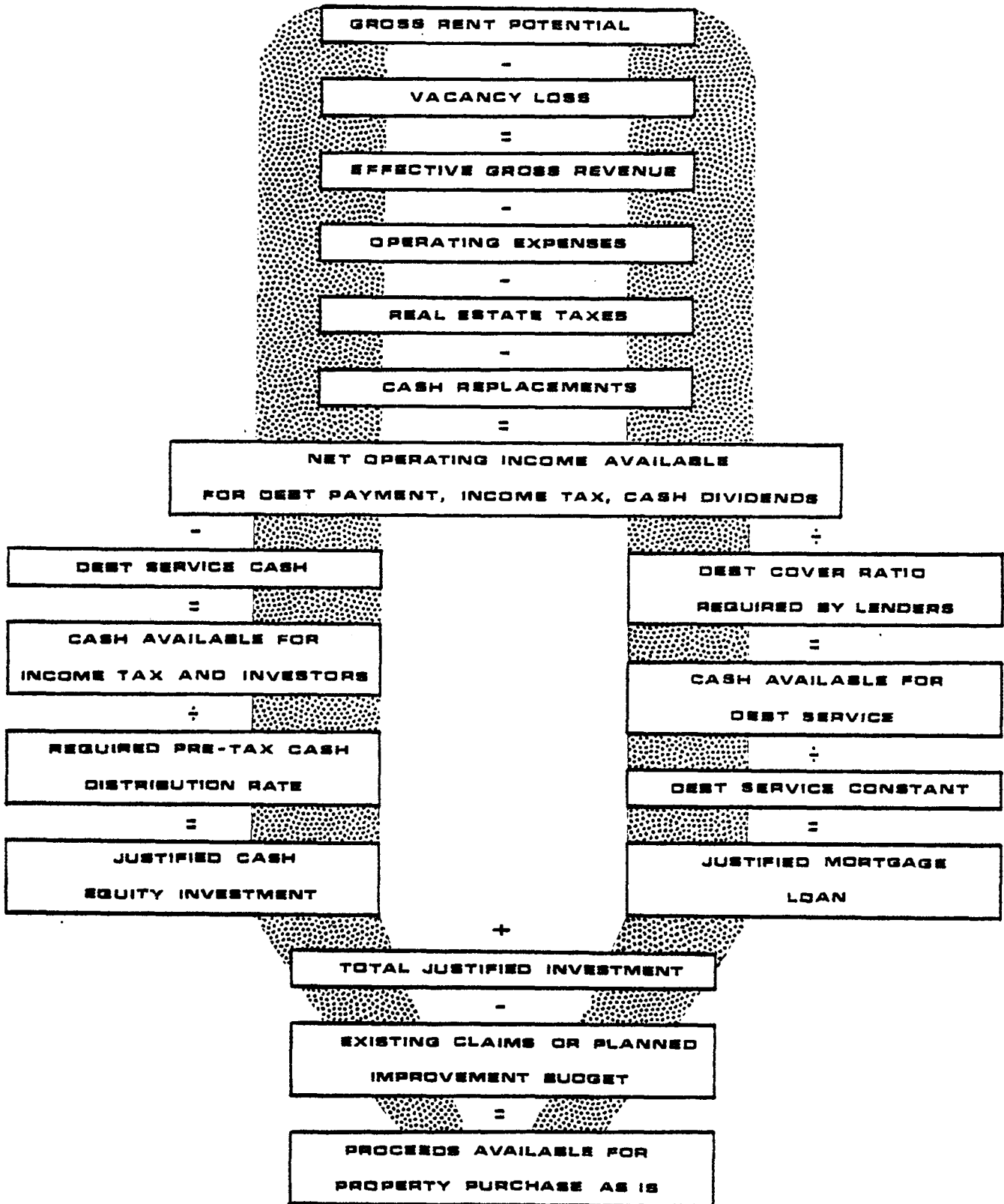
The MRCAP discounted cash flow program can solve for a justified project value by specifying the ratio of net income to debt service acceptable to an institutional mortgage lender. Given the interest rate and term available as of April 30, 1980, the program will solve for the justified amount of mortgage and for justified cash equity, assuming typical before-tax cash-on-cash investor requirements for office buildings, with potential for inflation sensitive rents. Exhibit 28 is a simplified flow chart depicting the steps in solving for the justified project budget.

On April 30, 1980, prudent lenders will require a minimum debt cover ratio of 1.3 and equity investors expect no less than 6 percent cash-on-cash.

1. Inputs into MRCAP Program

- a. Debt cover ratio = 1.3
- b. Before tax cash-on-cash requirements = 6%
- c. Project holding period = 5 years

REVENUE JUSTIFIED CAPITAL BUDGET DEBT COVER RATIO APPROACH



- d. Real estate taxes = historical pattern suggests real estate taxes at 5.4 percent of first year's gross with an annual inflation factor of 5% (see assumptions discussed below)
- e. Discount rate = 13% (present value factor used to discount cash flow)
- f. Reinvestment rate = 6% after tax rate applied to after tax cash flow
- g. Resale price = 10 times net operating income in year of sale
- h. Resale cost rate = 4%
- i. Working capital reserves from equity to cover one month's expenses = \$30,000
- j. Investor marginal income tax rate = 50%
- k. Land = \$340,000, as of most recent appraisal for IRS
- l. Buildings = 60% of total improvement value
- m. Mechanicals and site improvements = 40% of total improvement value
- n. Elevators = remaining book value of \$73,000
- o. Improvements for Energy Conservation = a total of \$54,000 which includes \$43,000 for storm windows and \$11,000 for natural gas conversion unit.
- p. Tenant Improvements = \$50,000 for carpeting and partitions as needed to upgrade vacant office space
- q. Investment Credit Dummy = to allow for tax benefit of investment credit in first year for capital improvement for energy conservation
- r. Mortgage = principal amount determined by debt cover ratio; interest rate a minimum of 12% with a 20-year term, paid monthly, on the first mortgage and 13% interest and an 8-year term for the second mortgage

2. Real Estate Tax Assumptions

Real estate taxes are a function of assessed value (or fair market value when assessed value is 100 percent of market value) and the net mill rate; therefore, real estate taxes are estimated as a function of gross rental income. During the past two years, real estate taxes have been between 5 percent and 6 percent of the Building's potential gross rental income. As a result of tests of several values between 5 percent and 6 percent, it is determined that 5.4 percent of gross rental revenues best represents the historical pattern of the Building's real estate taxes. MRCAP is programmed to use 5.4 percent of the first year's gross rental income to compute the first year's real estate taxes and then provides for a growth factor of 5 percent to increase the taxes each year thereafter.

D. Analysis of Test Results

Four runs of the MRCAP program were done using different assumptions about the amount of real estate taxes that would be paid on the subject property. Taxes and net mill rates for the past three years on the subject property have been:

<u>Year</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
<u>Real Estate Taxes</u>	\$33,118.75	\$29,951.95	\$25,340.93
<u>Net Mill Rate</u>	.026495	.024153	.022036

Real estate taxes estimated at various percentages of the first year's projected gross and inflated 5 percent a year gave these results in the MRCAP runs:

<u>Percentage of First Year's Gross Rental Revenue</u>	<u>Real Estate Taxes</u>				
	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
5.0	\$24,698	\$25,933	\$27,230	\$28,591	\$30,021
5.4	\$26,674	\$28,008	\$29,408	\$30,878	\$32,422
5.8	\$28,650	\$30,082	\$31,586	\$33,166	\$34,824
6.0	\$29,638	\$31,119	\$32,675	\$34,309	\$36,025

The real estate taxes estimated at 5.4 percent of the first year's gross rent best approximates the shift from a decreasing to an increasing net mill rate that can now be expected due to an anticipated decrease in state aids to cities. Rising costs of local government can be expected to be borne by the local taxpayer.

The input and output for the MRCAP program using real estate taxes estimated at 5.4 percent of gross rental revenue are found in Exhibit 29.

If taxes are a conservative 5.4 percent of gross rental revenue, MRCAP substantiates the fair market value of \$1,150,000 estimated by the market comparison approach to value.

EXHIBIT 29

MRCAP INPUT AND OUTPUT-- JUSTIFIED CAPITAL BUDGET WITH REAL ESTATE TAXES AT 5.4% OF FIRST YEAR'S GROSS RENT

MRCAP 09:49CST 12/20/80

ENTER INPUT FILE NAME?TENNEY

THE PROGRAM MRCAP IS THE PROPERTY OF
MICHAEL L. ROBBINS
C/O REAL ESTATE DYNAMICS INC.
4701 WINNEQUAH RD.
MONONA, WISC.

USER NO. 66

(608)-221-1120

NO REPRESENTATION IS MADE THAT THE ASSUMPTIONS OR
COMPUTATIONAL FORMAT USED IN THIS PROJECTION WILL
BE ACCEPTABLE TO TAXING AUTHORITIES.

*\$10.00 LIB CHG APPLIED

R E P O R T	S E C T I O N	N U M B E R	1	PAGE 1
=====				

* GROSS RENT	\$ 554378.	* RATE OF GROWTH OF GROSS RENT	0.0432
* EXPENSES	\$ 330234.	* RATE OF GROWTH OF EXPENSES	0.0936
* R E TAXES	\$ 29478.	* RATE OF GROWTH OF R E TAXES	0.0500
INCOME TAX RATE	0.5000	PROJECT VALUE GROWTH OF	2.0000
* VACANCY RATE	0.1375	WORKING CAPITAL LOAN RATE	0.1400
EQUITY DISCOUNT	0.1300	EXTRAORDINARY EXPENSES	\$ 0.
RESALE COST	0.0400	REINVESTMENT RATE	0.0600
WKG CAPITAL RS	\$ 30000.	CAPITAL RESER INTEREST RATE	0.
INITIAL COST	\$ 1091502.	INITIAL EQUITY REQUIRED	\$ 486009.

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

INITIAL COST DERIVED THROUGH BACKDOOR TYPE 3 USING 2 MORTGAGES

EXHIBIT 29 -- Continued

PRO FORMA
INVESTMENT ANALYSIS OF
BUILDING
FOR

REPORT SECTION NUMBER 2
=====

PAGE 1

COMPONENT SUMMARY

TITLE	PCT. DEPR	BEGIN USE	USEFUL LIFE	DEPR METHOD	COST	SCH
LAND	0.	1	25.	0	\$ 340000.	0
BUILDING	0.80	1	29.	2	\$ 338221.	0
HVAC	0.90	1	9.	2	\$ 225481.	0
ELEVATORS	0.90	1	4.	2	\$ 73000.	0
ENERGY CONSERVATION	0.90	1	5.	2	\$ 54000.	0
TENANT IMPROVEMENTS	0.90	1	10.	4	\$ 50000.	0
INVESTMENT CREDIT BU	1.00	1	1.	2	\$ 10800.	0

MORTGAGE SUMMARY

TITLE	INTR RATE	BEGIN YR.	END YR.	TERM	ORIG BALC	PCT VALUE
FIRST MORTGAGE	0.1200	1	20	20	\$ 531493.	0.487
SECOND MORTGAGE	0.1300	1	8	8	\$ 104000.	0.095

P R O F O R M A
INVESTMENT ANALYSIS OF
BUILDING
FOR

R E P O R T S E C T I O N N U M B E R 3

PAGE 1

CASH FLOW ANALYSIS

	1980	1981	1982	1983	1984
1 GROSS INCOME	506920.	535080.	550220.	579460.	600210.
2 LESS VACANCY	120790.	85330.	66480.	59910.	39220.
3 LESS REAL ESTATE TAXES	26674.	28008.	29408.	30878.	32422.
4 LESS EXPENSES	272260.	303180.	328640.	357700.	389390.
5 NET INCOME	87196.	118562.	125692.	130972.	139178.
6 LESS DEPRECIATION	76323.	64398.	63442.	62629.	45513.
7 LESS INTEREST	76472.	74515.	72298.	69785.	66938.
8 TAXABLE INCOME	-65599.	-20351.	-10048.	-1443.	26726.
9 PLUS DEPRECIATION	76323.	64398.	63442.	62629.	45513.
10 LESS PRINCIPAL PAYMENTS	14730.	16687.	18904.	21417.	24263.
11 CASH THROW-OFF	-4006.	27361.	34490.	39770.	47976.
12 LESS TAXES	0.	0.	0.	0.	13363.
13 LESS RESERVES	0.	0.	0.	0.	0.
14 CASH FROM OPERATIONS	0.	27361.	34490.	39770.	34613.
15 WORKING CAPITAL LOAN	0.	0.	0.	0.	0.
16 DISTRIBUTABLE CASH AFR TAX	0.	27361.	34490.	39770.	34613.
17 TAX SAVING ON OTHER INCOME	32799.	10175.	5024.	721.	0.
18 SPENDABLE CASH AFTER TAX	32799.	37536.	39514.	40491.	34613.

EXHIBIT 29 -- Continued

MARKET VALUE & REVERSION

=====

CASH FLOW ANALYSIS

=====

	1980	1981	1982	1983	1984
19 END OF YEAR MARKET VALUE	871962.	1185625.	1256921.	1309717.	1391778.
20 LESS RESALE COST	34878.	47425.	50277.	52389.	55671.
21 LESS LOAN BALANCES	620764.	604077.	585173.	563756.	539493.
22 PLUS CUM. CASH RESERVES	25994.	25994.	25994.	25994.	25994.
23 BEFORE TAX NET WORTH	242314.	560117.	647466.	719566.	822608.
24 CAPITAL GAIN (IF SOLD)	-181096.	182544.	313511.	426719.	551596.
25 CAPITAL GAINS TAX	-36219.	36509.	62702.	85344.	110319.
26 MINIMUM PREF. TAX	0.	0.	0.	0.	0.
27 INCOME TAX ON EXCESS DEP.	1500.	2438.	2897.	2950.	2657.
28 TOTAL TAX ON SALE	-16610.	38946.	65599.	88294.	112977.
29 AFTER TAX NET WORTH	258924.	521171.	581867.	631273.	709632.

BEFORE TAX RATIO ANALYSIS

=====

CASH FLOW ANALYSIS

=====

	1980	1981	1982	1983	1984
30 RETURN ON NET WORTH B/4 TAX	-0.5014	1.4245	0.2175	0.1728	0.2099
31 CHANGE IN NET WORTH B/4 TAX	-243696.	317803.	87349.	72100.	103042.
32 ORIG EQUITY CASH RTNB/4 TAX	-0.0082	0.0563	0.0710	0.0818	0.0987
33 ORIG EQUITY PAYBACK B/4 TAX	0.0000	0.0563	0.1273	0.2091	0.2803
34 B/4 TAX PRESENT VALUE	846386.	1092030.	1126006.	1142995.	1174189.

AFTER TAX RATIO ANALYSIS

=====

CASH FLOW ANALYSIS

=====

	1980	1981	1982	1983	1984
35 RETURN ON NET WORTH AFR TAX	-0.3998	1.1578	0.1923	0.1545	0.1790
36 CHANGE IN NET WORTH AFR TAX	-227086.	262248.	60696.	49406.	78359.
37 ORIG EQUITY CASH RTNAFR TAX	0.0675	0.0772	0.0813	0.0833	0.0712
38 ORIG EQUITY PAYBACK AFR TAX	0.0675	0.1447	0.2260	0.3093	0.3806
39 AFTER TAX PRESENT VALUE	893655.	1102069.	1124564.	1133307.	<u>1150082.</u>

CASH FLOW ANALYSIS

=====

	1980	1981	1982	1983	1984
40 NET INCOME-MARKET VALUE RTO	0.1000	0.1000	0.1000	0.1000	0.1000
41 LENDER BONUS INTEREST RATE	0.0000	0.0000	0.0000	0.0000	0.0000
42 DEFAULT RATIO	0.7696	0.7894	0.8165	0.8220	0.8547

EXHIBIT 29 -- Continued

INPUT FILE

09:48CST 12/20/80

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160 60,120790,85330,66480,59910,39220
170 70,.054,.05,*
180 80,272260,303180,328640,357700,389390
190 100,.13,.50,.06
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270 201,2,.60,.80,2
280 202,2,1,29,0
290 200,3,HVAC
300 201,3,.40,.90,2
310 202,3,1,9,0
320 200,4,ELEVATORS
330 201,4,73000,.90,2
340 202,4,1,4,0
350 200,5,ENERGY CONSERVATION
360 201,5,54000,.90,2
370 202,5,1,5,0
380 200,6,TENANT IMPROVEMENTS
390 201,6,50000,.90,4
400 202,6,1,10,0
410 200,7,INVESTMENT CREDIT DUMMY
420 201,7,10800,1,0,2
430 202,7,1,1,0
440 300,1,FIRST MORTGAGE
450 301,1,1,0,.12,0,20
460 302,1,12,1,20,0
470 303,1,0,0,0,0
480 300,2,SECOND MORTGAGE
490 301,2,104000,.13,0,8
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510 303,2,0,0,0,0
520 400,9
530 403,99,1,2,3,4,5
540 999,99

```

IV. Aside from the problem of defining and allocating income and reversion to the real estate interest, income property appraisal is at C. with the problem of cash equivalency adjustments for both comparable sales and the subject property. Many of the issues on how to appraise properties with economic development loans, state-subsidized housing loans, or seller financed property relate to when and how cash equivalency rules should be applied.

- A. Fair market value seems to call for cash to the seller (Exhibit 3) but then provides an exception where market practice may be different. The Institute textbook says,

"Unusual financing or other factors that might result in a price deviation from market value are also excluded. However, if the availability of other than conventional financing (such as FHA or VA loan terms) is sufficiently extensive to constitute a market within which the property being appraised is expected to sell, the typical purchaser may be expected to take advantage of this available financing, and the market value of the property reflects the probable sale price in this market. In market valuation assignments the appraiser first identifies the market in which the property being appraised will be exposed and sold. The market value of the property is then identified within parameters that reflect conditions in this market." Source: The Appraisal of Real Estate, Seventh Edition.

- B. In addition to market characteristics, we need to know the purpose of the appraisal before determining where their fair market value based on fee simple title or most probable price or going concern value is appropriate.
1. For example, the assessor is required by law to look at fee simple title; he does not recognize contract rents when they are below market rent nor can he look at premium rents and going concern values over and above market or economic rents. Cash equivalency is a must.
 2. However, in a Section 8 loan from a state housing authority, it is typical to take an assignment of the general partnership position which can be exercised by the Housing Authority in the event of default on the mortgage terms or the related property management agreement. Control of the property can pass through subsequent assignment without disturbing the tax position or the special non-market interest rate of the deal. Moreover, the rights transferred include existing reserve funds. Therefore, fair market value is not relevant relative to the security of the loan. The investor purchases a fee simple title encumbered by transfers of owner prerogatives to the government in exchange for tax privileges and minimum income guarantees for 20-40 years. That is the question of most probable price or going concern value.

3. Going concern value may be more relevant to an economic development loan. The public purpose of the loan subsidy is to create employment, improved physical environment, and the seeds of an economic base appropriate to redevelopment. In appraising the property for loan purposes the cash equivalency of fee simple title is not relevant if eventual delinquency on the loan gives the lender several options other than foreclosure. For example:
 - a. assignment of business ownership as collateral permits transfer and sale of the going concern to better management.
 - b. it could permit a change of use within constraints of the economic development program as a workout.
 - c. it could look to additional forms of subsidy, such as applied to Section 8 rehab money as a deep subsidy applied to rescue of a delinquent moderate 236 subsidy program.
 - d. Public purposes may create a monopoly for the facility to be appraised which provides a market price superior to fee simple title where it is not directly encumbered by long-term public priorities and commitments.
- C. If the appraisal is for loan security, then the issue is whether similar nonmarket credit terms would be available to the next buyer. VA loans are assignable; economic development loans may be transferable with a change in management; subsidized rental housing loans may be undisturbed by default because of the assignability of control via transfer of partnership interests.
 1. The appraiser does not discount a purchase price of a home purchased with a shared appreciation mortgage. That is contingent interest for the lender.
 2. If a builder of condominiums buys down the loan of his customer, what are those points really worth? It depends on how long the buyer owns the property and is really an oblique form of a shared appreciation mortgage, is it not? Contingent interest for the borrower as well as the lender.
 3. Appraisers have generally overlooked cash equivalency arguments relative to the seller paying the points to buy down the loan for the buyer in VA loans. Similarly, it should be disregarded on financing through prior builders' commitments. Do you discount project unit values because he bought a FNMA commitment or hedged in the GNMA certificates market? After all, these costs are also included in the price and may be included in the resale price.
- D. What is a point really worth? Refer to Exhibit 30.

WHAT IS A POINT REALLY WORTH?

Daniel J. O'Connell

Many real estate professionals compile lists of personal rules of thumb. Ideally these rules of thumb serve to reduce effort and raise productivity in daily decision making—with minimal sacrifice in accuracy and quality.

One rule-of-thumb that seems to have made a lasting impression is that the payment of one loan point¹ should equate to an $\frac{1}{8}$ percent reduction in the loan interest rate. For example, a borrower choosing between a $12\frac{3}{4}$ percent loan with 2 points from ABC Mortgage Company and a 13 percent loan without points from the XYZ Mortgage Company would be indifferent as to the choice.² According to the rule-of-thumb, the two-point charge supposedly equates to the $\frac{1}{4}$ percent ($\frac{1}{8}$ percent per point) difference in interest rates. However, that may not be a valid rule, as can be seen when comparing the points and no-points alternatives.

A purchaser buys a house to be financed with a \$100,000, 30-year loan. Financing is available from ABC Mortgage at $12\frac{3}{4}$ percent plus 2 points (\$2,000), and is also available from XYZ Mortgage at 13 percent with no points. This is illustrated in Table 1.

Assume the borrower plans to hold the property for a period of only two years at which point the balance of the

loan will be paid. The difference in payments between the two loans is \$468.00 for the two-year period, favoring the lower interest rate loan:

2-year payments @ 13%	\$26,548.80
2-year payments @ $12\frac{3}{4}$ %	- 26,080.80
Payment savings with $12\frac{3}{4}$ % loan	\$ 468.00

The difference in remaining balances upon the loan pay-off must also be taken into account. Because the $12\frac{3}{4}$ percent loan will amortize faster, it will have a remaining balance that is \$34.71 lower than the 13 percent loan at the end of the two years. Adding this balance to the \$468.00 in reduced payments results in a savings of \$502.71 over the two-year life of the loan:

Payment savings with $12\frac{3}{4}$ % loan	\$468.00
Additional loan reduction	+ 34.71
Total savings with $12\frac{3}{4}$ % loan	\$502.71

The borrower, if choosing the $12\frac{3}{4}$ percent loan, saves \$502.71 in payments and additional amortization over the 13 percent loan, but has paid \$2,000 to do so. Obviously, the two-point fee does not always equate to the corresponding $\frac{1}{4}$

Table 1

	ABC Mortgage Co.	XYZ Mortgage Co.
Loan	\$100,000	\$100,000
Interest rate	$12\frac{3}{4}$ %	13%
Monthly payments	\$1,086.70	\$1,106.20
Annual payments	\$13,040.40	\$13,274.40
Points	2	0
\$ Point charge	\$2,000	0

¹As used here, a point is defined as an additional, up-front charge made by a lender and paid by a borrower, that enables a loan to be made at a lower interest rate. A point is computed as 1% of the loan amount. More than one point may be charged, with

each point creating a corresponding decrease in the interest rate.

²Assuming the borrower has the available funds to pay the points.

Table 3**Discounted, after-tax payment savings with 12¾% loan**

	1	2	3	4	5
Year	Payment Difference	Tax Savings On 13% Loan	Annual After-Tax Payment Savings	Column 3 Discounted @ 8%	Cumulative Payment Savings
1	\$234.00	\$92.74	\$141.26	\$130.80	\$ 130.80
2	234.00	93.26	140.74	120.66	251.46
3	234.00	93.82	140.18	111.28	362.74
4	234.00	94.41	139.59	102.60	465.34
5	234.00	95.02	138.98	94.59	559.93
6	234.00	95.56	138.44	87.24	647.17
7	234.00	96.31	137.69	80.34	727.51
8	234.00	96.95	137.05	74.04	801.55
9	234.00	97.62	136.38	68.22	869.77
10	234.00	98.25	135.75	62.88	932.65
15	234.00	100.49	133.51	57.26	1,180.99
20	234.00	97.34	136.66	54.27	1,350.33
25	234.00	77.38	156.62	22.87	1,475.26
30	234.00	12.91	221.09	21.97	1,584.75

Column 1 is the annual difference in payments between the two loans with the advantage to the 12¾% loan.

Column 2 is the annual savings in taxes attributable to the 13% loan due to additional interest payments.

Column 3 is the combined effects of the first two columns: Column 1 minus Column 2 = Column 3.

Column 4 is Column 3 discounted to the present at 8% per annum.

Column 5 is the cumulative total of Column 4.

Table 4**Discounted, after-tax pay-off and combined savings with 12¾% loan**

	1	2	3	4
Year	Pay-Off Difference	Column 1 Discounted @ 8%	Cumulative Payment Savings (Table 3, Col. 5)	Combined Savings
1	\$ 16.65	\$ 15.42	\$ 130.80	\$ 146.22
2	34.71	29.76	251.46	281.22
3	54.29	43.10	362.74	405.84
4	75.44	55.45	465.34	520.79
5	98.26	66.87	559.93	626.80
6	122.80	77.38	647.17	724.55
7	149.09	86.99	727.51	814.50
8	177.13	95.70	801.55	897.25
9	206.96	103.59	869.77	973.30
10	238.51	110.48	932.65	1,043.13
11	271.70	116.53	990.61	1,107.14
12	306.38	121.67	1,044.06	1,165.73
13	342.37	125.89	1,093.37	1,219.26
14	379.38	129.16	1,138.90	1,268.06
15	416.98	131.45	1,180.99	1,312.44
20	589.40	126.45	1,350.33	1,476.78
25	601.55	87.84	1,475.26	1,563.10
30	0	0	1,584.75	1,584.75

Figure A

Present value of borrower's after-tax savings with up-front point deduction (TABLE 4)

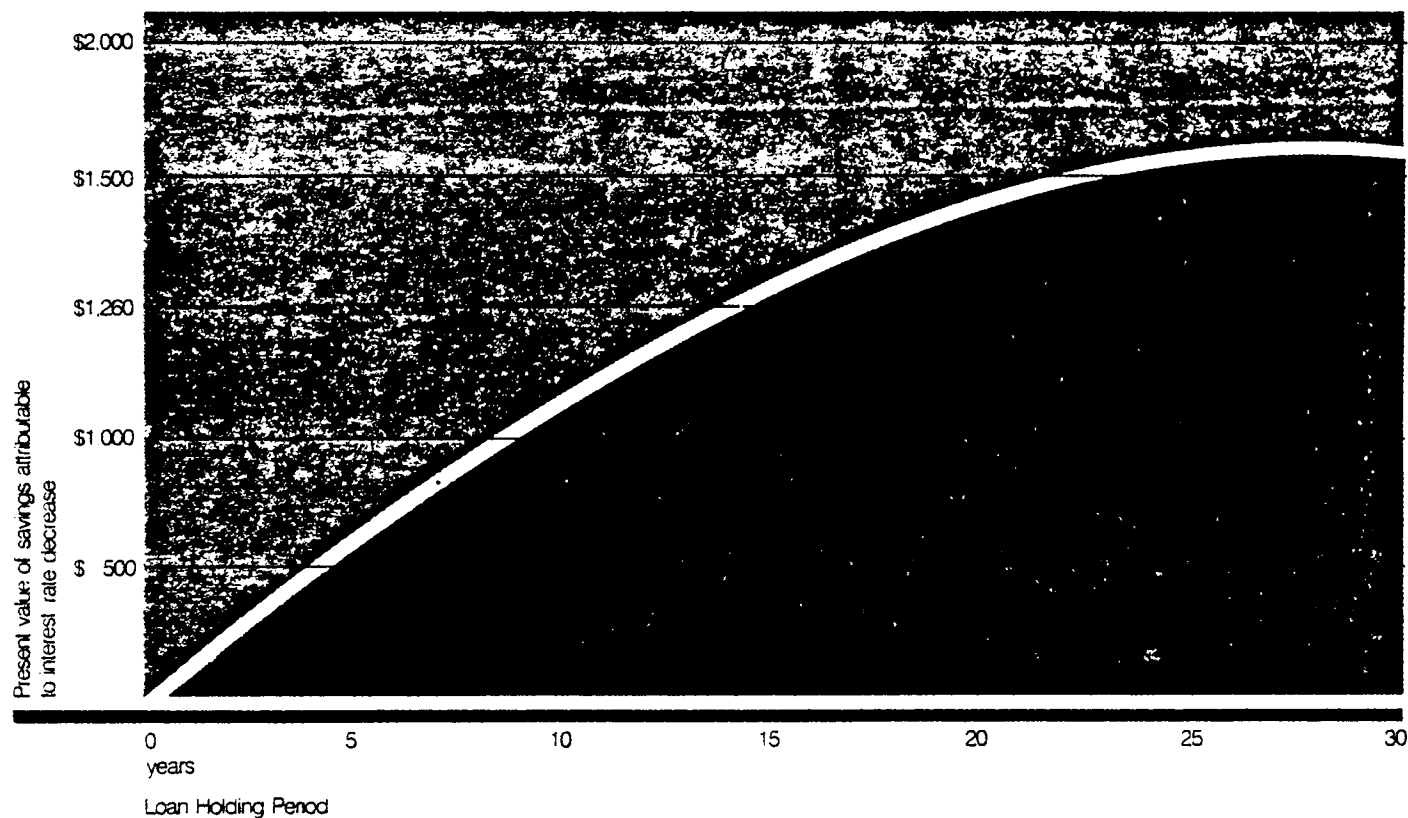


Figure B

Present value of borrower's after-tax savings with point charge added to basis

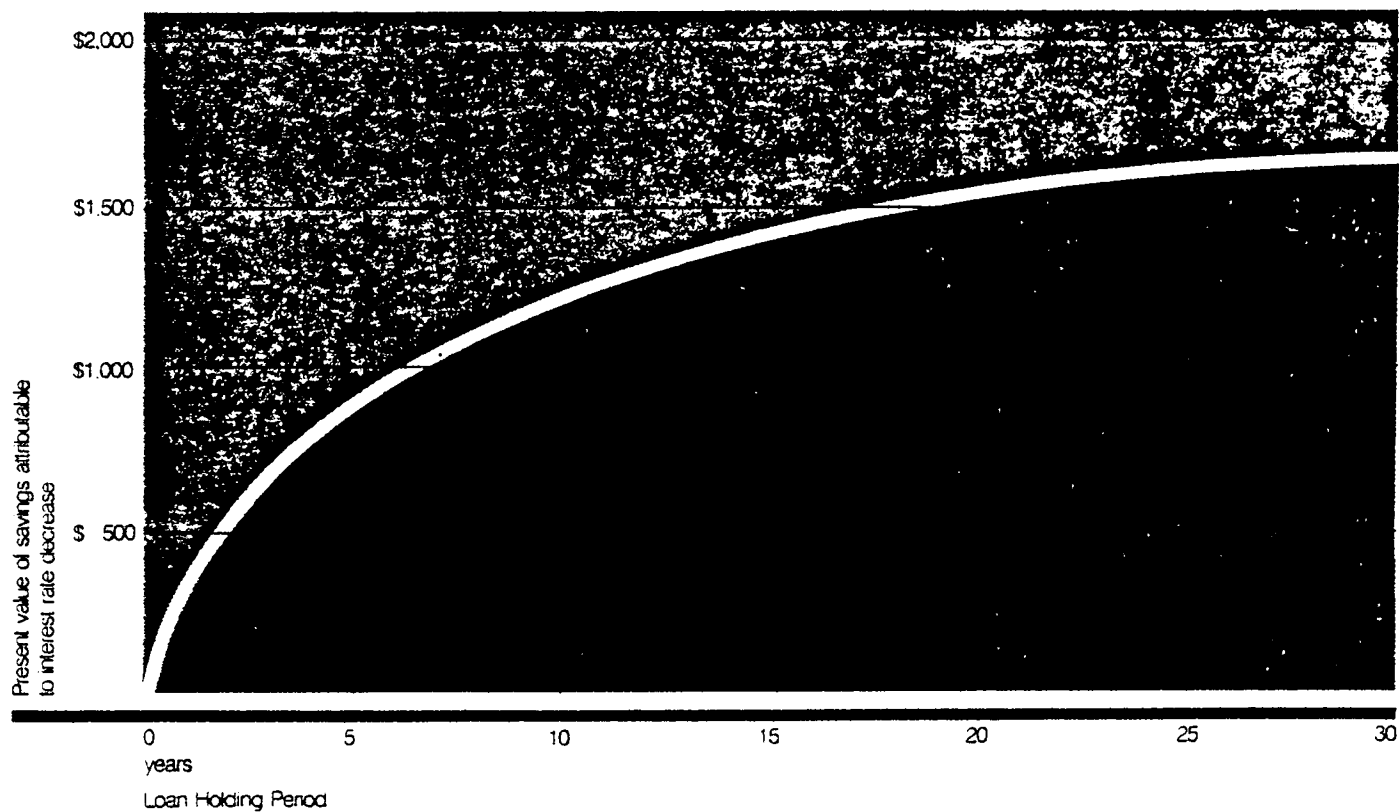


EXHIBIT 31

Example Problem: Cash Equivalent Price - Existing Mortgage plus
Purchase Money Mortgage

Given the following information, determine the cash equivalent
price of the transaction:

Sale Price	\$1,000,000
Existing Mortgage (assumed)	Balance \$682,052 Mo. Pmt. \$6,039.20 Contract rate 8.5% Expired Term 6 years Remaining Term 19 years
Purchase Money Mortgage	\$200,000 @ 10% Amortization over 20 years, balloon in 10 years
Current Financing	14.5%, 20 year amortization with 10 year balloon

- What is the equity investment?
- What is the balance outstanding on the existing (assumed)
mortgage in 10 years?
- What is the payment on the PMM?
What is the balance outstanding EOY 10?
- What is the cash equivalent price of the transaction?

Suggested Solution - II
Existing Mortgage plus PMM

A.	\$117,948
B.	\$454,781
C.	\$ 1,930 \$146,049
D.	Equity \$117,948
	Assumed Existing Mortgage
	PW \$6,039.20, 120 mos. @ 14.5% \$381,535
	PW \$454,781, EOY 10 @ 14.5%
	Purchase Money Mortgage
	PW \$1,930, 120 mos. @ 14.5% \$121,931
	PW \$146,049, EOY 10 @ 14.5% <u>\$ 34,558</u>
	Total (Cash Equivalent Price) \$763,581

IX. PROBLEM (CASH EQUIVALENCY)*

*Courtesy of A. Robert Parente, SREA, MAI.

An income producing property (special purpose) was resold by the Midland National Bank on a "workout." The terms of the sale were as follows:

Sale Price: \$1,178,808, no cash by purchaser, i.e., 100% debt financing

Terms of Financing: First year - interest only at a rate of 4-1/2% and payable monthly

Second year - interest only at a rate of 6% and payable monthly

For the next 23 years - principal and interest at 8-1/2%, payable monthly

The property (a 12,000 sq. ft., 3-year old restaurant building) was purchased on November 10, 1977 for \$1,178,808. Typical terms of financing at that time (11/77) were 9-3/4% interest for 25 years on a 75% loan-to-value ratio. It is estimated that equity required a 12-15% return.

Questions:

- A. What are the monthly interest costs in years 1 and 2?
- B. What is the constant on the amortized portion of the mortgage?
- C. What is the monthly payment on the mortgage?
- D. What is the unadjusted sales price per square foot for use in the DSC approach?
- E. What is the cash equivalent price assuming 100% financing were typical in the market?
- F. What is the cash equivalent price assuming an equity yield requirement of 12% 15%?
- G. What is the adjusted sales price per square foot under each of the conditions set forth above?

Suggested Solution - IX
Problem (Cash Equivalency)

A. Year 1: \$4,420.53
Year 2: \$5,894.04

B. $f = .09913$

C. \$9,737.97

D. $\$1,178,808 \div 12,000 = \$98.23/\text{sq. ft.}$

E. PW i Costs Year 1 @ 9-3/4% = \$ 50,347.92
PW i Costs Year 2 @ 9-3/4% = 60,918.28
PW Amortization payments
Years 3-25 @ 9-3/4% = 881,198.63

Cash Equivalent Price
(100% Financing) = \$992,464.83*

*\$186,343.17 less than face value of note

$\$992,464.83 \div 12,000 = \$82.71/\text{sq. ft.}$

F. Discount Rates given $Y = 12\%$, $Y = 15\%$, $m = 75\%$ $i = 9.75\%$

$Y = 12\%$

$Y = 15\%$

Mortgage $.75 \times .0975 = .073125$
Equity $.25 \times .12 = \underline{.03}$

$.75 \times .0975 = .073125$
 $.25 \times .15 = \underline{.0375}$

Discount Rate (r) = .103125

Discount rate (r) = .110625

PWCF @ 10.3125%

PWCF @ 11.0625%

Year 1 \$ 50,198.33
Year 2 60,399.42
Years 3-25 835,796.73

\$ 49,999.88
59,715.07
780,188.86

\$946,394.48**

\$889,903.81***

\$232,413.52 below face *\$288,904.19 below face

G. $\$946,394.48 \div 12,000 = \$78.87/\text{sq. ft.}$

$\$889,903.81 \div 12,000 = \$74.16/\text{sq. ft.}$

EXHIBIT 33

CASH EQUIVALENCY EXAMPLE

NAKOMA HEIGHTS
168 APARTMENT UNITS
SOLD NOVEMBER 1, 1979
NOMINAL SALES PRICE \$3,450,000

- A. One appraisal reviewed recently contained the following summary analysis.
It is used as it probably parallels the Madison Assessor's Office perception
of the transaction:

<u>Date</u>	<u>Price</u>	<u>Gross</u>	<u>Net</u>	<u>GIM</u>	<u>Income Expense</u>	<u>S.P. Unit</u>	<u>OAR</u>
7/79	\$3,450,000	\$449,249	\$196,548	7.68	56.3	\$20,536	5.7

- B. Cash Equivalency - Monthly payment differential

If 25% down with 75% L/V at 10.55 for 25 years

Down	862,000
Mortgage	<u>\$2,588,000</u>
	\$3,450,000

Monthly payment \$24,528; Annual payment \$294,335

1979 - 4/80	Conv. Mortgage	\$294,335	
	L.C. (9.25)	<u>272,875</u>	
		\$ 21,460/12	= \$1,788 (A)

4/80 - 4/81

\$2,950,000			Conv. Mortgage	\$294,335
<u>250,000</u>				<u>249,750</u>
\$2,700,000	X	.0925	=	\$ 44,585/12 = \$3,715 (B)

4/81

\$2,700,000				\$294,335
<u>250,000</u>				<u>226,625</u>
\$2,450,000	X	.0125		\$ 67,710/12 = \$5,643 (C)

NET PRESENT VALUE UNDER
L.C. FINANCING AND BALLOON PAYOUT
ACCORDING TO CONTRACT ON 12/31/85

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982 - 84</u> <u>4 years</u>
Down Payment	\$500,000 <u>3,576 (2A)</u> \$503,576	\$250,000 5,364 (3A) <u>33,435 (9B)</u> \$288,799	\$250,000 11,145 (3B) <u>50,787 (9C)</u> \$311,932	\$ 67,710 (12C)
				Balance <u>2,450,000</u> <u>\$2,517,710</u>

NET PRESENT VALUE CONVENTIONAL LOAN

	<u>1979</u>	
Down Payment	\$862,000 --	Balance <u>2,404,022</u>

Cash year 1	\$503,576	\$288,799	\$311,932	
		<u>.884666</u>	<u>.796455</u>	
Cash year 2	255,491	\$255,491		
Cash year 3	248,440		248,440	
Cash year 4	48,551			\$67,710
Cash year 5	43,710			67,710
Cash year 6	39,351			67,710
Cash year 7	<u>\$1,317,332</u>			\$2,517.710
	\$2,456,451	Total Cash Equivalency (Versus \$3,450,000 nominal selling price)		

INCOME PREPOTED (Contract)	GROSS INCOME NET INCOME	\$499,249 <u>196,548</u>
-------------------------------	----------------------------	-----------------------------

MARKET RENT LEVELS

At least gross	\$450,000
Less 40% expense	<u>180,000</u>
NOI	\$270,000

$$\text{OAR} = \frac{270,000}{2,456,451} = .109915$$

$$\text{SP/Unit} = \frac{2,456,451}{168} = 14,622$$

1. Most probable price always requires a statement as to the financial terms which are a condition of effective demand at that price. Fair market value definition is sufficiently ambiguous to require a statement of financial terms as a qualification on conclusion.
 2. In practice you ignore points paid by the seller in a VA loan. To predict the most probable price, why not ignore points paid by the seller for a conventional loan? For loan security the lender is interested in the most probable price at which it will sell or whether the spread between probable price and fair market value will be covered by private mortgage insurance. In the latter case the appraiser could provide both numbers if asked.
 3. Only the assessor is locked into cash equivalent fair market value!
- E. The mechanics of cash equivalency values come into play where income properties are sold subject to non-market financing or for purposes other than income investment, such as syndication or condominium conversion. Professors Byrl Boyce and William Kinnard have prepared an excellent half-day presentation on cash equivalencies. The cases in Exhibits 31 and 32 are from their seminar and are suggestive of the mechanics of cash equivalency due to non-market financing.

Session #9 - The Real Estate Investment Broker as Investment Counselor

- A. Almost everybody approaches a real estate appraiser or a broker with a false premise as to just what they do and how they operate. There is a tendency to presume the product desired as a fair market appraisal if you are talking about somebody who calls himself an appraiser; there is also the presumption that one will buy or sell if you contact a broker so that by the time the contact is made the client already perceived the problem as having reached the point that he needs an appraisal or needs a transaction.
- B. The role of the consultant is to assist the client in moving from the problem as originally perceived, subject to the unconscious buyers position, to a broader based position of the problem as understood. What is the real question is more important than the search for answers. There are a variety of creative tricks to initiate that process:
 - 1. Rollback the problem to a lower level of significance on some hierarchy of the decision process. If the client wants to buy, find out if the problem would work with a short term lease; if the client wants to lease, find out if he could avoid any additional real estate by changing his procedures for purchasing, warehousing, etc.
 - 2. Reduce a new problem to a familiar format by analogy or gain perspective on a familiar problem with a far-fetched analogy.
 - 3. Put the problem in a chronological order of development - the dates and time of who said what to who.
- C. Guide discussion with the client along the following line:
 - 1. See if he can teach you his format for success in whatever he does.
 - 2. How does he compensate employees?
 - 3. How does he meet competitive risk?
 - 4. How does he meet systematic risk?
 - 5. What are his personal goals?
 - 6. What is his favorite investment?
 - 7. Why does he want to invest in real estate?
- D. Another way to understand a client's real estate problem is to understand the linkages of each item in his balance sheet and P&L statement to the institutional framework in which it operates - its situs factor.
 - 1. Networks and capacity of the terminal points
 - 2. Contiguous uses and ownership pattern
 - 3. Nearby generators of demand and supply
 - 4. Relationships remote in distance or in time
- E. The consulting functions are related to basic decision making and problem solving.
 - 1. Reduce anxiety for the client
 - 2. Dilute responsibility for the client
 - 3. Help redefine the question more appropriately
 - 4. Help select a statement of objectives
 - 5. Help select criteria with which to evaluate alternative courses of action
 - 6. Allow the client to make the choice between/among alternatives

- F. Selection criteria should be customized to focus on the problem:
1. Cost per sq. ft. of first floor area or gross building area
 2. Income per acre or income per dollar investment
 3. Gross profit as percentage of sales or dollars per sq. ft.
- G. Rejection criteria or payoff matrix should be carefully defined to represent strategic and personal goals as well as technical maximization.

July 14, 1973

Mr. Donald Casey Hambleton
President, Real Property Analysts, Inc.
42 E. Gay Street
Columbus, Ohio 43215

Dear Casey:

In response to your note of June 28, I'll confirm for December 1, 1973.
A vita sheet is enclosed.

There has been no time for a detailed outline, but I would like your
response to the following tentative outline:

- I. Introduction
 - A. The Search for a market
 - B. The Search for a site
 - C. The Search for money
 - D. The Search for political support
- II. Which Comes First: Site or Market?
 - A. Quick measures of local demand for building sites
 - B. Quick checks of future need for building sites
 - C. Defining a tentative customer profile
 - D. A Site search checklist
- III. Determining Development Attributes of a Site
 - A. Physical characteristics
 - B. Environmental characteristics
 - C. Marketable characteristics
 - D. Land use--site attribute matrix
- IV. Financial Attributes of Land Development
 - A. Basic cash flow format
 - B. Basic provisions for financial flexibility
 - C. Sources of Financing
 - D. Yield and risk
- IV. The Politics of Land Development
 - A. Identification of protagonist and antagonist
 - B. Bias of regulatory agencies having jurisdiction

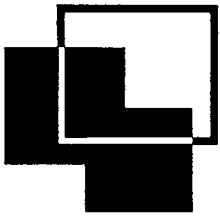
- C. The no-growth syndrome
- D. Alternative political strategies as profit centers

Don't publish the above outline until you and I discuss it a little further.

James A. Graaskamp

JAG:jar

Enclosure



rpa

Real Property Analysts, inc.

Donald Casey Hambleton & Associates, Inc. *Affiliate*
42 E. Gay Street, Columbus, Ohio 43215 • (614) 224-3115

July 17, 1973

Dr. James A. Graaskamp
202-A Breeze Terrace
Madison, Wisconsin 53705

Dear Dr. Graaskamp:

As a graduate student in real estate and finance at Ohio State University, I am pleased that Mr. Hambleton has asked me to help in coordination of the seminar efforts.

Real Estate Educational Services, Inc., is pleased to receive your confirmation of the December 1, 1973 seminar date. Your tentative outline seems appropriate at this time and can be further discussed when more fully developed.

I will arrange accommodations for the nights of November 30th and December 1st. Please reply as soon as possible the number of rooms and type of accommodations you desire.

Cordially,

REAL ESTATE EDUCATIONAL SERVICES, INC.

Norman G. Miller

Norman G. Miller

NCM:lms

cc: S. Powers

R. Weiler

D. Kelley

R. Royer

G. Seckel

R. Emens

LAND INVESTMENT SEMINAR
Sponsored by
Real Estate Educational Services, Inc.
The Christopher Inn, Columbus, Ohio
December 1, 1973

Instructor: Professor James A. Graaskamp
University of Wisconsin School of Business

I. Concepts and Definitions Basic to Land Investment

- A. Real estate is a dynamic space-time interface of land (public resource), people (cultural preference) and artifacts (improvements). These forces can be reduced to specific decision makers - a consumer, a producer, and a political agency. The planner is an arbitrator.
- B. Each of the three decision makers represents an enterprise. An enterprise is an organized undertaking and some enterprises are cash cycle enterprises constrained by a need for solvency, short term and long term.
 - 1. The interface occurs where the consumer, producer, and governmental cash cycle each achieve solvency.
 - 2. The business of real estate is the process of converting space-time to money-time.
 - 3. The business of real estate is a service industry using manufactured products to create profit opportunities for services.
- C. The general theory of the management process for any enterprise can be converted to real estate semantics:

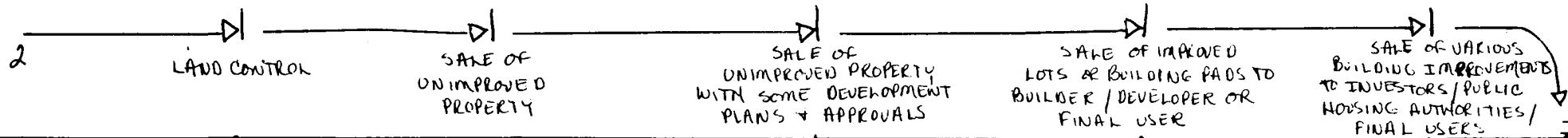
<u>Column 1</u>	<u>Column 2</u>
Values, objectives, policy	Strategic format
Search for opportunity alternatives	Market trend analysis
Selection of an opportunity	Merchandising target with monopoly character
Program to capture opportunity	Legal-political constraints
	Ethical-aesthetic constraints
	Physical-technical constraints
	Financial constraints
Construction of program	Project Development
Operation of program	Property Management
Monitoring and feedback	Real Estate research

- D. Until recently the producer - you the land investor and developer - had the dominant role in determining land use, improvement type, and the tempo of development. During the 70's we are in the process of transition to a very different scheme of things for land development and the basic factors are:
 - 1. A public consensus that land is an exhaustible resource and therefore a public utility.

2. Improvements to land are the physical environment or terrarium which shape social behavior and therefore a matter for more extensive control than before.
 3. Private rights to land exist only as a residual which remain after definition of public rights.
 4. Money, not real estate, is the private resource in the land development process.
 5. While land is the first to feel the reapplication of public control, the auto and energy industries will quickly face even more rigid control.
 6. During the 70's the public will be developing the mechanics by which it controls land use (and others) while minimizing windfalls and wipeouts of private money assets related to land use.
- E. As the public reacquires its right to control land use or internalizes development costs formerly shifted to the public, ownership of land only provides access to opportunity alternatives.
1. The remaining profit centers in alternatives are for various professional services.
 2. In a service industry there is no ownership of a product - only control of a customer and land control means customer control.
 3. A real estate project is a huge customer for a variety of professional services and therefore the future developer will be vertically integrated to provide as many of the required services as possible.
 4. Real estate equity is rapidly becoming the degree to which one controls disbursements of a captive customer for services.
- F. A hierarchy of land investment analysis steps:
1. Project feasibility is a non-financial concept of fitting site, hardware, and services to a context of public priority and customer need.
 2. Land investment is "buying" a set of financial assumptions derived from a set of feasibility assumptions.
 3. Investment risk is the potential variance between assumptions taken and realization achieved, between pro forma estimates and a P & L statement.
- II. The first step in the land development process is to make explicit the values, objectives, and policy with which the land investor will search, select, and program an opportunity. In short, - investor, know thyself.
- A. For discussion purposes there are four phases of land development which might provide alternative investment strategies.

STRATEGIC FORMAT OF DEVELOPER ROLE AND FUNCTION

	LAND CONTROL	SALE OF UNIMPROVED PROPERTY	SALE OF UNIMPROVED PROPERTY WITH SOME DEVELOPMENT PLANS & APPROVALS	SALE OF IMPROVED LOTS OR BUILDING PADS TO BUILDER/DEVELOPER OR FINAL USER	SALE OF VARIOUS BUILDING IMPROVEMENT TO INVESTORS/PUBLIC HOUSING AUTHORITIES/FINAL USERS
DEVELOPMENT ROLE ASSUMED	LAND SPECULATION hold or "land bank" interesting property	"PACKAGING" conceptualize development plan or land use — acquire parcels — public approvals such as zoning — arrange financing or structure deal.	LAND DEVELOPER undertake and complete land development phase — install roads, utilities, common improvements, survey and subdivide for sale.	BUILDING DEVELOPER undertake and complete various building improvements — offer and consummate sales.	
MAJOR OBJECTIVE	capture "spread" between raw land purchase cost and wholesale price evoked by "mass" market trends.	increase spread or value by bringing an important trend to focus on a specific site or into focus as a potential project. Shift buyer's perception through description, analysis, various "enabling" factors	increase spread or value by virtue of completing improvements that further shift buyer's perception of utility and make sites available for construction.	create construction and sales profit through completion of building improvements that further shift buyer's perception of utility/value and make buildings available for occupancy/ownership	
KEY DETERMINANTS OF ECONOMIC SUCCESS	1) ability to accurately forecast a trend 2) ability to select and control attractive land	1) ability to complete a convincing study of economic feasibility. 2) ability to obtain key public action in timely fashion 3) ability to perform at "conceptual selling"	1) ability to efficiently complete various improvements 2) ability to efficiently (and tastefully) market improved building sites. 3) ability to carry financing cost	1) ability to efficiently complete various building improvements 2) ability to efficiently market 3) ability to carry debt.	
THOSE ELEMENTS OF THE COST/PRICE RELATIONSHIP OVER WHICH THE DEVELOPER HAS SOME CONTROL (major tasks to be completed or costs to be incurred — specific problems of estimating, analysis, evaluation)	1) land price 2) carrying costs 3) legal expense 4) maximum loss	5) feasibility determination: • site or physical determinants • regulatory or political factors • market determinants • "reappraisal" or investment valuation (what's the deal worth if we do it vs. what's the deal worth if we get out now?) 6. obtain basic public approval = (zoning) 7) arrangement of financing (takeout) 8) marketing costs	9) obtain specific public approvals 10) negotiate and secure various contracts within budget 11) stage/manage/control development on time, within budget + quality standards 12) arrange interim financing — land development loan 13) stage/manage/control the marketing of improved lots or building sites 14) obtain sales approval, registration etc.	15) obtain construction permits + approvals 16) negotiate and secure various contracts within budget. 17) stage/manage/control construction effort on time, within budget + quality standards 18) arrange interim + long term financing (construction loan and mortgage) 19. stage/manage/control the marketing of various building improvements 20. obtain sales approval, registration, etc.	



ELEMENTS OF RISK INCURRED (or places where "slippage" may occur)					PROPERTY MISMATCH
1) various factors or events never materialize in a way that makes the property an attractive candidate for development 2) complete lack of analysis, planning, or other preparation for development means that property is never perceived as attractive or ready for development	1) costs of undertaking and completing above-listed analyses, estimates (esp. if feasibility study produces unattractive outcome and development is dropped) 2) development cost shifts 3) shifts in market situation (new market or competitive standard, general economic conditions) 4) regulatory standards change 5) cost or availability of financing shifts 6) reliability of various estimates + analyses 7) lose control of land or development situation 8) public approvals denied, delayed, or conditioned	1) delay in obtaining public approvals, attachment of conditions to approval, high costs of soliciting approval, or denial. 2) delay in completion of improvements 3) cost over-run on improvements 4) poor quality of finished improvements or related adverse side effects (eg. class action suits) 5) failure to carefully estimate TOTAL cost of improvements (installation, operation/maintenance, assurances) 6) lagging market performances • slowed pace of sales • lower price of units offered • higher cost of sales	1) delay in obtaining permits 2) delay in completion of improvements 3) cost over-run on improvements 4) poor quality of finished improvements or related adverse effects (eg. call-backs, class actions) 5) lagging market performance • slowed pace of sales • lower price of units offered • higher cost of sales		
GENERALIZATIONS	entrepreneurial-intensive roles	time necessary to capture profit is diminishing (holding period shortens) and this affects capital turnover? How about "entry fee" or amount of capital needed, however?	ratio of value-added to costs is diminishing as the composite cost base builds up?	management-intensive roles	
			more complexity, more internal variables to control; management burden requirements?	incremental cost vs profit centers	
			increasing "image" or credibility exposure — what are the consequences of taking on a deal and failing — a lingering risk even if you escape with the dollars		

3	LAND CONTROL	SALE OF UNIMPROVED PROPERTY	SALE OF UNIMPROVED PROPERTY WITH SOME DEVELOPMENT PLANS & APPROVALS	SALE OF IMPROVED LOTS OR BUILDING PLOTS TO BUILDER/DEVELOPER OR FINAL USER	SALE OF VARIOUS BUILDING IMPROVEMENTS TO INVESTORS/PUBLIC HOUSING AUTHORITIES/FINAL USERS	
DEVELOPER TRAITS LIKELY TO BE STRONG DETERMINANTS OF PERFORMANCE (Key Skills)	foresight, anticipation, imagination, ability to quickly size up a situation and act decisively, ability to handle land control devices and financing with ingenuity FORESIGHT, INGENUITY	conceptual ability/imagination, analytical skills/estimating ability, project evaluation/judgment, conceptual "selling" ability/persuasion structuring deals IMAGINATION, CONVINCING ANALYSIS, DESCRIPTION, SALE	ability to generate reliable estimates, negotiate and fix development costs, stage-manage - control development effort, stage-manage - control marketing effort FINALIZE OR CLOSE, EXECUTE/EXPEDITE, CONTROL, SELL	ability to generate reliable estimates and fix construction costs, stage-manage - control construction effort, stage-manage - control marketing effort SAME AS PREVIOUS BLOCK		PROPERTY NUMBER
COMPONENTS OF COST/PRICE (what's the deal worth if we do it vs. what's the liquidation value of the deal if we get out now?)	profit to landholder appraisal (resale forecast) legal fees land control	profit to packager financing commitment structuring the deal acquisition of public approvals project evaluation/display land control	land developer's fee promotion/marketing additional financing cost of improvements financing commitment structuring the deal acquisition of public approvals project evaluation/display land control	developer's fee implementation & sale of building improvements preparation for building improvements implementation of land development preparation for land development land control		
TRENDS?	entrepreneurial-intensive roles PASSIVE ROLE	ratio of value added to costs is diminishing as the composite cost base builds up? time necessary to capture profit is diminishing (holding period shortens) and this affects capital turnover? How about "entry fee" or amount of capital needed, however? more and more internal variables to control; more complex deals, management burden or time requirements? Also, Graafland's idea on increasing "image" or credibility exposure on a deal and failing - a lingering risk even if you escape with the dollars	incremental cost vs. profit centers management-intensive roles			

1. Sale of unimproved property
 2. Sale of unimproved property with master plan and public approvals
 3. Sale of improved lots and building pads
 4. Sale of totally improved packages to investors/public authorities/
final users (at that point refer to box outline)
- B. For each development role accepted it is necessary to define the strategic format relative to:
1. Elements of customer/marketing channels where developer has some control
 2. Elements of cost/price relationship where developer has some control
 3. Elements required with greatest potential for variance
 4. Devices for maximizing control
 5. Devices for minimizing risk
 6. Development skills of critical importance
 7. Marginal components of cost/price/profit centers
- C. Define enterpriser talents and shortcomings and then fit the organization to the proper strategic phase. This step leads to definition of preliminary opportunity selection screens.
- D. Each of these elements will suggest several criteria or "screens" which will control the search for a land development or investment opportunity for the aggressive investor, for example:
1. Found within 50 miles of the home office and in the same state to limit management travel.
 2. Can be purchased on the land contract conditional on zoning with strict foreclosure the only remedy for the seller.
 3. Can be sold to builders in the area who are short of sites.
 4. Required public infrastructure for roads, sewer, and education already exist.
 5. Permits salvage of a site blighted with gravel pits or strip mining.
- E. Strategic format or "screens" for the passive investor
1. Identification of channeled population and land use demand corridors and rate of movement along corridors.
 2. Identification of linkage force fields which will lead to recycling of obsolete structures.
 3. Pleasure, pain, and bailout theory of management incentives.

4. Predetermination of the necessary liquidation price as a "call" feature (pleasure).
5. Holding power (pain threshold).
6. Arrangement of financing as a "put" in the futures market (bailout).

III. The search for development opportunity within the screens suggested above depends on what options remain open to the investor.

A. Which comes first - site, expertise, market, or money?

1. The best position is to first define a market and then search for a site which meets the needs of the market.
2. The second best position is to recognize or establish control of expertise and then let the experts do their own thing.
3. The most difficult position is to own a site for which it is then necessary to find a marketable use.
4. Money is always available for a good opportunity.

B. The search for a market is first concerned with quantitative measures and then with qualitative segmentation of the market. The secret to a good market search is the ability to discard most of the information quickly in a systematic way.

1. Assume a tentative land use type consistent with preliminary screens and identify the largest unit of elimination. For example:
 - a. SMSA
 - b. Community
 - c. Community sector
 - d. Land use type - motel, professional clinic, residential, etc.
 - e. Competitive standard analogy
2. Name the competitive alternatives and count the total supply.
 - a. Plat books, building permits, announced rentable area, etc.
 - b. Spillover, piracy, statistical tactics
3. Measure the total absorption rate in terms of the space/time unit sold or renting for these comparables to determine the total absorption rate of space units per year, per season, or per month.
 - a. Name the revenue unit.
 - b. Absorption rate is concerned with aggregate demand, smooth curve averages of sale and inventory functions.
 - c. A search of public records and industrial espionage
4. Establish an initial capture rate that is reasonable conservative by price range. The capture rate is that percentage of the total absorption rate which could be secured by a single project in a given price range or land use type. The capture rate should be refined as the land development program takes form and must be completed for each land use type. Eventually it becomes the sales quota for the sales manager.

5. The capture rate ultimately represents a definition of the scale of the project and the phasing of the project. For example, if the total market for townhouse pads was 300 per year in the southwest quadrant of town and the capture rate was 15%, then you might plan initially for 45 units a year. At a gross density of 9 per acre that would be 5 acres per year and therefore if your time horizon was 5 years for a sellout, you would want no more than 25 acres of ground.
6. By letting the market define the site, you are in a better position to buy several small sites, each ideal for a subsection of the market than to purchase one large chunk for which you have to think up multiple uses. (Or redefine market to sell acres, not pads).
- C. Statistical definition of a market from census data may be simplified by the use of computerized census tract data, much of it block by block. One computer service advertises that by terminal or mail-in you can give the longitude and latitude of a site and they will give you all the census data within some diameter of that site, say quarter, half mile, five miles, whatever and they now offer projection updates for 1970 data. The address:

Michael E. Jakes
SITE Demographic Systems
529 5th Ave., Suite 1301
New York, N.Y. 10017
- D. A more refined approach to a correct customer profile of competitive projects or land uses is the telephone survey using:
 1. The reverse telephone directory
 2. The license plate survey
 3. Registers of restaurant, motel, building directories, etc.
 4. The classified ad technique
 5. Low level planning department aerial photographs
- E. Analysis of micro-market customer needs and motivations for certain site attributes.
 1. Cross tabulations by computer or card sorts
 2. The search for anxieties or irritations as a possibility for establishing a competitive edge.
 3. General psychological motivation and utility curve studies
 4. The American Land Development Association, 1000 16th St., NW
Washington, D.C. 20036.

COFFEE BREAK 10:30 - 10:45

F. If the search for an opportunity begins with a site already owned, then it is best to begin the search for the market by defining the positive and negative attributes of the site in terms of the market-ability of alternative land uses.

1. The static attributes are the physical facts of the site in terms of the shape, size, frontage, soils, and special features, both natural and manmade which may be of use or negative characteristics which must be overcome or neutralized by design.
2. The dynamic attributes of the site relate to peoples relationships and reactions to it in terms of visibility, aesthetics, status image, convenience, anxieties and linkages of activities to and around it.
3. Political attributes of the site relate to existing zoning, the master plans and biases of those having jurisdiction on the site, its acceptability to key governmental agencies and the historical political concern with the site, if any.
4. Relating various site attributes to alternative land uses should make possible identification of certain alternative markets which could then be explored.
5. Price is not a site attribute, even if it is really cheap, until you know more than the seller does about these site attributes.

IV. There has been a revolution in the supply of information about sites which is leading to a revolution and a degree to which the public can police land use within an acceptable cost/benefit ratio. Due process of law requires factual information as to cause and effect and the technology of the space age will have more immediate impact on the use of the surface of this earth than it will for the time being on the surface of the moon.

A. Louie Carter has a song about things that seem the same but are really not. He refers to a place with birds and bees and grass and trees but to some its just a vacant lot. There is no such thing as raw land or a vacant lot. Option and then study the physical characteristics.

1. A basic list of data types and cheap sources of information is provided in Exhibit A.
2. Space research and military intelligence have developed some incredible new information gathering devices related to the ERTS program - Earth Resources Technology Satellite (Exhibit B).
 - a. Thermal and infrared photography
 - b. Planning Department high and low survey photography
 - c. Soil conservation service assistance in almost every court house (can mean constructive notice of soil limitation).
3. Physical limits are also provided by concealed utility easements and old foundations or controls on access. Proximity is not accessibility.

4. Any development proposal must be structured to neutralize and dispose land forms that cannot and should not be developed as well as land which can be improved and sold.
- B. Environmental characteristics can be both positive and negative.
1. Scarce environmental elements can lead to litigation and adverse public image.
 2. Anticipate problems of impending legislation rather than simply meeting current standards relative to:
 - a. Ground water, depth and conservation of high water recharge areas
 - b. Conservation of environmental edges
 - c. Conservation of prime agricultural
 - d. Impact on off-site areas down wind or down stream
 3. Some attributes can lead to a monopoly advantage. For example, if government has not provided adequate flood down stream and built areas, it may encourage developer to build water retention ponds on his development despite protests of naturalists.
 4. Recycling of obsolete buildings and sites within existing urban areas generally produces a favorable environmental impact on site but this may offset other standards of manmade environment.
 - a. Noise as a function of traffic count
 - b. Density as a function of floor area ratio and DU count
 - c. Air pollution as a function of heating system and available energy source
 - d. Environment suitability as a function of security and amenities
- C. The marketable characteristics of a site relate primarily to its dynamic attributes and these begin off site. Site dynamics refers to existing attitudes of land regulators or potential customers as well as potential attitudes which can be formed and exploited by the developer.
1. Approach zone
 2. Historical community reputation and image of the area
 3. Visual factors - visibility, view, background association, potential for controlled site lines (for urban sites read by Kevin Lynch)
 4. Potentials for romancing the politician and the consumer
 5. Anxiety factors of access, security, crowding
- D. Legal political characteristics of the site are not always obvious from existing zoning or recorded easements Consider:
1. Premises of community masterplans still in incubation process
 2. Tax conservancy commitments
 3. Extra territorial zoning or subdivision powers
 4. Attitudes of sewer, water, and highway commissions

5. Contractual agreements among previous buyers and sellers which may or may not run with the land
 6. Attitudes of existing, though dormant, property owners associations
- E. Set up a land use-suitability matrix and then determine how much of the site is actually usable to produce saleable units in terms of floor area ratio, gross acres developable, number of dwelling units, etc. Purchase price must always be related by the buyer to usable net acres even though the seller wants to talk in terms of gross area.
1. Amelia Island Case - Exhibit C
 2. Lily Lake Case - (slides)
 3. Simple suitability overlays on topographic maps
- F. Investment as opposed to crap shooting means review of the alternative outcomes inherent in the facts as one can discover them and the determination that there is a reasonable likelihood of achieving explicit objectives despite known constraints and limited resources.
1. Facts can be assembled at little expense but with some patient inquiry about physical aspects of an investment site. No sense speculating about those.
 2. Physical facts and any proposed improvement plan can be converted into the assumptions of a financial plan which is the subject of the afternoon's presentation.
 3. Cultural preference element however remains highly indeterminant during this transition from a decade of unlimited growth to planned internalizing of the social costs of growth with a resulting redistribution of effective income and shift in the social ethic from consumption to conservation. Some implications of cultural trends are:
 - a. Energy crisis will redefine linkages to utilities regionally as well as locally.
 - b. Energy crisis will mean redefinition of the auto and all auto dependent forms of land use.
 - c. Energy crisis will alter expansive character of current leisure time marketing to reduce dependency on hardware.
 - d. Public controls plus large scale use of condominium and home-owners associations means success of hardware is tied directly to success of group organization software.
 - e. Control of new land development plus control of auto transit means recycling of intown sites.
 - f. As real estate becomes recognized as a service product, fee ownership declines in significance.

LU:CH 12:00 - 1:00

EXHIBIT "A"

INTRODUCTION

This data list is not to be viewed as a final or all inclusive list of needed environmental factors but rather a general framework through which we can work with the County's representatives in identifying the necessary factors needed to assist them in their decision making.

SUGGESTED ENVIRONMENTAL FACTORS

AND POSSIBLE DATA SOURCES

A. PHYSICAL CHARACTERISTICS

1. EARTH

- *a. Mineral resource [Geological studies/U.S.G.S.]
- *b. Construction material [Geological studies/U.S.G.S.]
- *c. Landform [Geological studies/U.S.G.S.]
- *d. Unique physical features [Geological studies/U.S.G.S.]
- *e. Soil [Form 1972 Soil Survey]
 - 1. Depth to bedrock
 - 2. Depth to seasonal high water table
 - 3. Unified class
 - 4. AASHO class
 - 5. Liquid limit
 - 6. Plastic limit
 - 7. Permeability
 - 8. Available water capacity
 - 9. Reaction-ph.
 - 10. Salinity
 - 11. Shrink-swell
 - 13. Suitability-topsoil
 - 14. Suitability-sand and gravel
 - 15. Suitability-road fill
 - 16. Hydrologic soil group
 - 17. Suitability-road location
 - 18. Water retention-embankment

- 19. Water retention-reservoir area
- 20. Agricultural drainage
- 21. Irrigation
- 22. Limitation-septic tank
- 23. Agricultural capability unit

f. Topography

- *1. % slope-average predominant type [U.S.G.S.]
- *2. Centroid elevation [U.S.G.S.]
- *3. Orientation [U.S.G.S.]

2. WATER

*a. Surface

- *1. Lakes or pond [U.S.G.S./Infra Red Photo]
- *2. Rivers [U.S.G.S./Infra Red Photo]
- *3. Stream [U.S.G.S./Infra Red Photo]
- *4. Intermittent stream [U.S.G.S.]

b. Underground

- *1. Ground water levels at wells [Hydrologic data]
- *2. Recharge areas [Geological studies]

3. PROCESSES

*a. Floods

- 1. 10 year [Infra Red or Color Photo]
- 2. 25 year [Infra Red or Color Photo]
- 3. 50 year [Infra Red or Color Photo]
- 4. 100 year [Infra Red or Color Photo]

*b. Stability

- Slides and slumps [Geological studies/Soil Map/Photo]

*c. Stress-strain

- Earthquake [Geological studies/Photo's]

*d. Air movements

[Climatological Data]

B. BIOLOGICAL CONDITIONS

1. FLORA

*a. Dominant type

- 1. Trees [Infra Red Photo]
- 2. Shrubs
- 3. Grass
- 4. Crops
- 5. Swamp

*b. Endangered species

[State/County Studies]

1. Tree
2. Shrub
3. Grass
4. Other

2. Fauna

*Endangered species

[State/County Studies]

C. CULTURAL FACTORS

*1. LAND USE- Dominant type

[Infra Red Photo's]

- a. Wilderness
- b. Wetland
- c. Forest
- d. Grazing
- e. Agriculture
- f. Residential
- g. Commercial
- h. Industrial
- i. Mining and quarrying/wells

*2. RECREATION

[State/County/Infra Red Photo]

- a. Hunting
- b. Fishing
- c. Boating
- d. Swimming
- e. Camping and hiking
- f. Picnicking
- g. Golfing
- h. Tennis
- i. Other

*3. AESTHETICS AND HUMAN INTEREST

[State Studies/Infra Red Photo]

- a. Scenic views and vistas
- b. Wilderness qualities
- c. Landscape design
- e. Unique physical features
- f. Parks and reserves
- g. Monuments
- *h. Rare and unique species or ecos./stems [State/Infra Red Photo]
- *i. Historical or archaeological sites
and objects [State Studies/Infra Red Photo]

4. CULTURAL STATUS

*a. Cultural patterns (life Style) [State/ Photo's]

*b. Population density

[Photo's]

5. MAN-MADE FACILITIES

*a. Transportation network

[U.S.G.S./Photo's]

*b. Utility network

[County/Photo's]

*c. Waste disposal

[County/Photo's]

6. POLITICAL BOUNDARIES

*a. Zoning

[County]

*b. Special assessment districts

[County]

*c. Sewage district

[County]

*d. City boundaries

[County]

*e. School district

[County]

High, Junior, Elementary

Exhibit B

INTRODUCTION

Appraisers and real estate counselors are expected to consider a great array of information when reviewing land in its present and projected uses. In attempting to respond to these reviews or assistments these persons must begin to search out and exploit to the fullest all sources of accurate and relevant information.

A variety of government agencies are expanding the number of free and low cost sources of information. This information is available to the citizen, providing he knows how and from where to request the information.

The following list of sources is organized by agency and type of information or data index available from each agency.

I. The United States Geological Survey

Address: Map Information Office
U.S. Geological Survey
Washington, D.C. 20242

Phone: 202/343-2446

A. Topographic Map

A topographic map is a graphic representation of selected manmade and natural features. It is a record in convenient readable form of the physical characteristics of the terrain as determined by precise engineering surveys and measurements. The distinguishing characteristic of a topographic map is that through the use of a contour symbol it portrays the shape and elevation of the landscape. To understand the contour symbol, think of it as an imaginary line on the ground which takes any shape necessary to maintain a constant elevation above sea level.

The colors in which symbols are printed indicate the general classes of map features they represent. Symbols for water features are printed in blue; manmade objects (roads, railroads, buildings, transmission lines, and many others) are shown in black; and green is used to distinguish wooded areas from clearings. The contours which portray the shape and elevation of the land surface are printed in brown.

On recent maps, solid red is used to represent or emphasize certain cultural features, such as the more important roads, fence lines, and the boundary lines of townships, ranges, sections, and land growth in states subdivided by public land surveys.

A booklet describing topographic maps and symbols is available free upon request from the Map Information Office of the U.S. Geological Survey.

B. Status Index Maps

Maps showing the status of various phases of mapping and areas covered by aerial photography in the United States are available free on request. There are three types of status index maps all printed at the same scale. Scale, 1:5,000,000 (1 inch = about 80 miles); Size, 27 x 41 inches.

1. Topographic Mapping--Status and Progress of Operations (7-1/2 and 15 minute series).

Shows the status of topographic mapping and progress of operations in the United States by the Geological Survey and other federal agencies. General appraisal of the adequacy of these maps is indicated by color patterns. Published semi-annually.

2. Status of Aerial Photography.

Shows the areas that have been photographed and agencies holding the film. Aerial photographic coverage is shown only if reproductions are available for purchase.

3. Status of Aerial Mosaics.

Shows areas in the United States for which mosaics or photomaps have been prepared from aerial photographs, scale of negatives, dates of photography, and sources from which copies may be obtained.

C. State Index Maps

Shows published topographic maps in each state, Puerto Rico, and the Virgin Islands. Available free on request

from U.S. Geological Survey, Washington, D.C. 20242, or Federal Center, Denver, Colorado 80225. These indexes contain lists of special maps, addresses of local map reference libraries, local map dealers, and federal map distribution centers. An order blank and detailed instructions for ordering maps are also supplied with each index.

D. Geological Survey Photography

Probably one of the greatest sources of exploitable information is the aerial photograph. Advances in the development of new films and cameras has brought to the decision-maker a totally new dimension in area analysis. Available today is not only the customary black and white photography taken from 5,500 to 24,000 feet above the ground, but also color and color infrared photographs, many taken from an elevation as high as 65,000 feet above the ground.

1. Aerial Photographic Reproductions

The Map Information Office, U.S. Geological Survey, maintains records of aerial photographic coverage of the United States and outlying areas, based on reports from federal and state agencies and commercial companies. From these records, the Map Information Office furnishes data to prospective purchasers on the available photography and the agency or firm holding the aerial film.

Geological Survey vertical aerial photography is obtained primarily for topographic and geologic mapping. Reproductions from this photography are usually satisfactory for general use. Because reproductions are not stocked, but are custom processed for each order, they cannot be returned for credit or refund.

2. Print Sizes

Contact prints are the same size as aerial negatives, approximately 9 x 9 inches. Prints are available with stereoscopic overlap or without such overlap (pictorial coverage). Photographs with stereoscopic overlap, when viewed with a stereoscope, will permit the observer to obtain a mental impression of the three dimensional shape of the

landscape. Stereoscopic coverage requires about twice as many prints as pictorial photography. Orders for photographs or requests for information should specify which type is needed.

Enlargements to an exact ratio or to a specific scale are available. If ratio factors are not furnished by the purchaser, enlargements will be processed to ratios derived from lens focal lengths and flight heights specified in the photographic contract or reported by the contractor.

Prints are processed only from whole negatives; prints of selected parts of negatives are not available.

Index: A complete index listing type of photography, scale, date, direction flight was flown, and lens focal length is available from any of the regional headquarters. Where large areas are involved, photo indexes are essential for selecting prints and should be requested.

3. Photography Orders

Because many types of reproductions are available, requests should state the purpose for which the photographs are desired and define the specific area of interest by means of a detailed description, sketch, or latitude and longitude position. The size of photographs and type of coverage (pictorial or stereoscopic) should also be specified.

- a. Requests for reproductions or information from the following states should be sent to:
Atlantic Region Engineer, U.S. Geological Survey, 1109 N. Highland St., Arlington, Va. 22210.

Alabama, Connecticut, Delaware, Florida, Georgia, Indiana, Kentucky, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, Vermont, West Virginia, Puerto Rico, Virgin Islands, U.S.

- b. Requests for reproductions or information from the following states should be sent to:
Central Region Engineer, U.S. Geological Survey, Box 133, Rolla, Mo. 65401.

Arkansas, Illinois, Iowa, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Oklahoma, Nebraska, North Dakota, South Dakota, Wisconsin.

- c. Requests for reproductions or information from the following states should be sent to:
Rocky Mountain Region Engineer, U.S. Geological Survey, Building 25, Federal Center, Denver, Colorado 80225.

Alaska, Colorado, Montana, New Mexico, Texas, Wyoming.

- d. Requests for reproductions or information from the following states should be sent to:
Pacific Region Engineer, U.S. Geological Survey, 345 Middlefield Road, Menlo Park, California 94025.

Arizona, California, Hawaii, Idaho, Nevada, Oregon, Utah, Washington.

Shipment by parcel post or railway express is prepaid. Extra charges for shipment by air express or airmail and special delivery are paid by the purchaser.

Check, money order, or draft payable to the U.S. Geological Survey must accompany the order. Refund will be made for any part of the order that is not filled.

II. ERTS

On Sunday, July 23, 1972, the Earth Resources Technology Satellite (ERTS-A) was launched into orbit. It is a butterfly shaped observatory flying in a 570 mile circular orbit which is nearly polar. From this vantage point, its imaging systems provide useful information concerning agriculture and forest resources, mineral and land resources, water resources, marine resources, land use and environmental quality, and ecology.

ERTS circles the earth every 103 minutes or 14 times per day. The pass is from north to south at an angle of 80° retrograde to the equator. Each pass covers a region 115 miles wide, however there is some overlap between the proceeding and succeeding passes. After 18 days or about 252 passes the satellite returns to the same position. In other words ERTS covers the entire globe every 18 days.

The ERTS-A spacecraft carries two types of imaging sensors: the Return Beam Vidicon (RBV) cameras and the Multi-Spectral Scanner (MSS).

The Return Beam Vidicon cameras are television cameras mounted side by side in the spacecraft and bore-sighted to simultaneously photograph the earth beneath the spacecraft in each of three spectral regions: .475 to .575 micrometers (blue-green, Band 1); .580 to .680 micrometers (red, Band 2); and .690 to .830 micrometers (near infrared, Band 3). These cameras do not contain film but rather their images are stored on photosensitive surfaces within each vidicon camera which in turn is scanned by an internal electron beam to produce a video picture. This process requires 11 seconds to read out and transmit all three pictures. The RBV cameras will repeat the cycle each 25 seconds producing overlapping pictures of the ground scene below with 10% overlap.

The Multi-Spectral Scanner Subsystem (MSS) covers the same area as the RBV system in four wavelength bands: .5 to .6 micrometers (green, Band 1); .6 to .7 micrometers (red, Band 2); .7 to .8 (near infrared, Band 3); and .8 to 1.1 (near infrared, Band 4).

The Multi-Spectral Scanner and Return Beam Vidicon cameras on ERTS-A take pictures in specific wavelength bands for very particular reasons.

1. Green, Band 1, .5 to .6 micrometers.

This band appears green to the naked eye. Water is quite transparent in this band which consequently tends to enhance features contained within water such as sediment. Unfortunately, light scattering in the atmosphere makes "seeing" in this band difficult at times.

2. Red, Band 2, .6 to .7 micrometers.

This band appears red to the eye. Unlike the green band, the red easily penetrates the atmosphere. This is good for land use mapping where regional population patterns need to be observed against the vegetation patterns. The red band shows good contrast between natural surface cover such as vegetation which absorbs most of this energy against manmade structures which strongly reflect this energy. Many manmade structures appear very bright against dark appearance of vegetation. Bare soil is often highly reflective in this band, so that deserts are best seen in this band.

3. Infrared, Bands 3 and 4, .7 to 1.1 micrometers.

This is invisible to the human eye. Water appears black in the infrared because water almost totally absorbs the radiant energy in these wavelengths. A significant characteristic about the infrared bands is that vegetation appears bright and water appears dark. As a comparison, vegetation is as bright in the infrared as snow is in the visible region.

The average green leaf reflects about 20% of green light and absorbs the other 80%. It absorbs approximately 95% of red light due to absorption by chlorophyll and is frequently called the chlorophyll absorption band. It reflects approximately 80% of the infrared light and transmits the other 20%. The brightness of vegetation in this band depends upon several things. First, the type of vegetation, i.e., big leaves will be brighter than small ones. Hardwood trees (deciduous) show up brighter than pine (evergreen). Because of leaf thickness, tobacco shows up brighter than wheat. Second, in the infrared, crop brightness depends upon plant health. Healthy crops, in the infrared will be much brighter than diseased vegetation.

A. How ERTS Imagery May Be Obtained

ERTS imagery may be obtained at cost from several sources: EROS (Earth Resources Observation Systems), NOAA (National Oceanographic and Atmospheric Administration, and The Department of Agriculture.

1. The EROS Data Center

The EROS Data Center in Sioux Falls, South Dakota, is operated for the Earth Resources Observation Systems Program of the Department of the Interior by the Topographic Division of the Geological Survey to provide access to Earth Resources Technology Satellite (ERTS) imagery, USGS aerial photography, and NASA aircraft data for the general public, domestic government agencies at all levels, foreign government agencies at all levels, and foreign government. Facilities are available for data storage, retrieval, reproduction, and dissemination, and for user assistance and training.

a. ERTS Imagery

ERTS imagery, originally processed at the Goddard Space Flight Center, NASA Data Processing Facility (NDPF), is a significant part of the Data Center imagery file. Each scene, covering 10,000 square nautical miles, is imaged seven times from ERTS-A. The raw data is either system corrected images (bulk processed) and provided to the Data Center in the form of 70 mm film, or scene corrected images (precision processed) and provided on 240 mm film at a scale of 1:1,000,000. The Data Center has a catalog of the ERTS imagery and a 16 mm browse film including only one RBV image and one MSS image per scene for rapid evaluation of coverage and cloud cover.

Copies of the system corrected individual images are available at contact scale, 1:3,369,000 approximately 2-1/2 x 2-1/2 inches or enlarged by a factor of 3.369 to 1:1,000,000 scale, approximately 9 x 9 inches including marginal data. Color composites, derived by processing the three RBV or three of the four MSS images together are available only at a scale of 1:1,000,000 of those frames prepared by NDPF.

Copies of scene corrected (precision) images may be obtained only at scales of 1:1,000,000 or larger. These images have been rectified at the NDPF to orthographic photographs and have been overprinted with the UTM grid.

Both individual and color composites are available at 1:1,000,000 scale, approximately 9 x 9 inches including marginal data. Only about 5% of the ERTS images available in the Data Center will have been precision processed.

b. NASA Aircraft Imagery and Photography

Imagery and photography obtained by NASA, as part of its aircraft program in support of the development of Earth Resources Surveys by aircraft and spacecraft, are processed at the Manned Spacecraft Center, Houston, Texas, and at the Ames Research Center, Moffett Field, California. The data was acquired for specific purposes and to varied specifications as to time, aerial coverage, and sensors, and is primarily of test sites within the continental United States. Supplementary to the NASA aircraft program data, are the earth-oriented photographs from the Apollo and Gemini manned spacecraft missions. A catalog of all this NASA imagery and photography, and browse films, is also at the Data Center.

Copies of these images and photographs may be purchased at contact scales, enlargements, or reductions, in color or black and white, on film or on paper, in rolls or cut. Provided with each image order are annotations on a computer printout that provide: date, local time, geographic coordinates, print scale, flying height, film, filter, sensor, originating agency, project, roll and frame, and order number in an understandable code.

c. USGS Aerial Photography

Aerial photographs taken by the U.S. Geological Survey primarily for purposes of topographic and geologic mapping are available from the Data Center. The vast majority are black and white vertical photographs at a scale of approximately 1:24,000, but they range in scale from 1:12,000 to 1:66,000. In addition, photography flown in support of various projects of the Bureau of Reclamation and Land Management is routinely provided to the U.S. Geological Survey for indexing and general distribution.

These photographs are at various scales reflecting the specifications of the particular project.

Photographs obtained prior to 1941 are held by The National Archives and Record Service. This material is available on request but not within the normal one week reproduction time.

d. How to Place an Order

To obtain data from the EROS Data Center you may:

Telephone from: 7:00 a.m. to 7:00 p.m., Central Time
605/339-2270 (Commercial)
605/336-2381 (Federal Telephone System Users)

Visit from: 7:45 a.m. to 4:30 p.m., Central Time
EROS Data Center
10th and Dakota Avenue
Sioux Falls, South Dakota

Write at any time:

EROS Data Center
Data Management Center
Sioux Falls, South Dakota 57198

If you should need assistance EROS personnel will help you identify the data best suited to your needs, but you must be prepared to tell them:

1. Limits of the geographic area of interest,
2. What you want to use the data for, and
3. How you want to use the data.

e. Browse Films

Copies of ERTS imagery, aircraft program imagery and photography, and USGS photography produced on 16 mm film are available for purchase. These films are not intended for basic research.

They are designed to provide prepurchase evaluation of such things as: aerial coverage, cloud cover, and sensor angle. Most of the browse films have two indexes to locate scenes at high speeds: Kodamatic Indexer Code Lines and Image Control; NASA aircraft program imagery and photography browse films have only Image Control. The film is supplied on an open reel and each film is designed so that it can be cut and mounted by the user for microfiche presentation. Browse films for ERTS data are updated every 18 days and are available on a subscription basis. Updating of the other browse films is irregular and films must be purchased individually.

Browse file locations have been established by the Department of the Interior at:

EROS Data Center
U.S. Geological Survey
10th and Dakota Avenue
Sioux Falls, South Dakota 57198
Phone: 605/339-2270

Map Information Office
U.S. Geological Survey
Room B-310, GSA Building
18th and F Streets, NW
Washington, D.C. 20242
Phone: 202/343-2611

CARETS Information Center
U.S. Geological Survey
Room 837, 1717 H Street, NW
Washington, D.C. 20242
Phone: 202/343-5985

Water Resources Division
U.S. Geological Survey
Room 343, Post Office and
Court House Building
Albany, New York 12201
Phone: 518/472-3107

U.S. Geological Survey
5th Floor, 80 Broad Street
Boston, Massachusetts 02110
Phone: 617/223-7202

EROS Program Assist. Office
Room B-210, Building 1100
U.S. Geological Survey
Mississippi Test Facility
Bay St. Louis, Miss. 39520
Phone: 601/688-3541

Regional Topographic Engineer
U.S. Geological Survey
Room 2404, Building 25
Denver Federal Center
Denver, Colorado 80225
Phone: 303/234-2351

Water Resources Division
U.S. Geological Survey
Room 5107, Federal Building
230 North 1st Avenue
Phoenix, Arizona 85025
Phone: 602/261-3188

Public Inquiries Office
U.S. Geological Survey
Room 7638, Federal Building
300 N. Los Angeles Street
Los Angeles, California 90012
Phone: 213/688-2850

Public Inquiries Office
U.S. Geological Survey
Room 678, U.S. Court House Bldg.
West 920 Riverside Avenue
Spokane, Washington 92201
Phone: 509/456-2524

Public Inquiries Office
U.S. Geological Survey
108 Skyline Building
508 2nd Avenue
Anchorage, Alaska 99501
Phone: 907/277-0577

Regional Topographic Engineer
U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025
Phone: 415/323-8111

Inter American Geodetic Survey
Headquarters Building
Fort Clayton, Canal Zone
Phone: 117-1201
Panama Routine 833-227

Topographic Division
U.S. Geological Survey
961 Pine Street
Rolla, Missouri 65401
Phone: 314/364-3680

State Topographic Engineer
Florida Dept. of Transportation
State Topographic Office
Lafayette Building
Koger Office Center
Tallahassee, Florida 32304
Phone: 904/599-6212

Director
Portland Service Center
U.S. Bur. of Land Management
710 N.E. Holladay
Portland, Oregon 97208
Phone: 503/234-4100

EROS Program Library
U.S. Geological Survey
Room 827, 1717 H Street, NW
Washington, D.C. 20244
Phone: 202/343-7500

Chief, Maps and Surveys Branch
Tennessee Valley Authority
200 Haney Building
311 Broad Street
Chattanooga, Tennessee 37401
Phone: 615/755-2133

Dr. Everett A. Wingert
University of Hawaii
Department of Geography
Physical Science Building
Room 313-C
Honolulu, Hawaii 96822
Phone: 944-8463

EROS Coordinator
Office of the Governor
Pago Pago, American Samoa
Phone: 32203

EROS Coordinator
Trust Territory of the Pacific
Islands
Office of the High Commissioner
Saipan, Mariana Islands 96950
Phone: 202/343-2141 or 2176

Dr. Frank J. Janza
Sacramento State University
Dept. of Electrical Engineering
6000 Jay Street
Sacramento, California 95819
Phone: AC-916/454-6545

Dr. Douglas Smith
University of Guam
EROS/P.I.E.R. Program
Section of the Pacific Room
P.O. Box EK
Agana, Guam 96910
Phone: 749-2921, Ext. 363

2. National Oceanographic and Atmospheric Administration

The Department of Commerce, National Oceanographic and Atmospheric Administration (NOAA) has an Earth Resources Data Center at Suitland, Maryland. This center will furnish data gathered by ERTS to users in the oceanographic, hydrologic, and atmospheric sciences as well as to the general public.

To aid in selecting the data desired, NOAA has established public browse files at 22 locations around the nation. They are located in:

Hillcrest Heights, Md.	Fort Worth, Tex.
Rockville, Md.	Salt Lake City, Ut.
Silver Spring, Md.	Anchorage, Alaska
Washington, D.C.	Honolulu, Hawaii
Miami, Fla.	Norman, Okla.
Norfolk, Va.	Boulder, Colo.
Garden City, N.Y.	LaJolla, Calif.
Woods Hole, Mass.	Tibaron, Calif.
Asheville, N.C.	Seattle, Wash.
Detroit, Mich.	Madison, Wisc.
Kansas City, Mo.	College Station, Tex.

Reproductions may be ordered from the National Climate Center, NOAA Environmental Data Service, Federal Building, Asheville, N.C. 28801.

3. Department of Agriculture

The Department of Agriculture also sells ERTS imagery dealing with agriculture. Photos may be obtained from the Western Aerial Photo Laboratory, Agricultural Stabilization and Conservation Service, USDA, 2505 Parley's Way, Salt Lake City, Utah 84109.

It is now possible to order ERTS Standard Catalogs from the Superintendent of Documents. Private individuals should direct requests to the NASA Publications Desk, at the main GPO bookstore, 710 North Capital Street, Washington, D.C. 20402, Telephone: 202/783-3238.

III. U.S. Department of Agriculture - Soil Conservation Service

The U.S. Department of Agriculture, in cooperation with state agricultural experiment stations and other federal and state agencies, has been making soil surveys and publishing them since 1899. These surveys are designed to furnish soil maps and interpretations needed in guiding decisions about soil selection, use, and management.

Since these soil surveys are a basic scientific inventory, they can provide valuable information needed for land use planning, highway location and design, park and open space planning, subdivision layout and designs, planning and design of sewage disposal facilities, zoning and other land use controls, as well as for agricultural and forest land use planning and management.

Soil surveys published since 1957 contain many different kinds of interpretations for each of the different soils mapped in the area. The kind of interpretations included in these recent surveys vary with the needs of the area, but the following interpretations are in most of them: estimated yields of the common agricultural crops under defined levels of management, land-capability interpretations, soil-woodland interpretations, range land interpretations, engineering uses of soils, interpretations for community planning, suitability of the soil for drainage and irrigation, and suitability of the soil for recreation and wildlife.

Most of the soil surveys published since 1957 contain soil maps printed on a photomosaic base. The usual scale is 1:20,000 or 1:15,840 depending upon the needs of the area.

A soil survey published by the U.S. Department of Agriculture that is still in print may be obtained in one of the following ways:

1. Land users in the area surveyed and professional workers who have use for the survey can obtain a free copy from the local office of the Soil Conservation Service, from their county agent, or from their congressman. Those outside the area surveyed who have

use for the survey can obtain a free copy from the Information Division, Soil Conservation Service, Washington, D.C. 20250.

2. For a time after publication, copies may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
3. Many libraries keep published soil surveys on file for reference. Also soil conservation district offices and county agricultural extension offices have copies of local soil surveys that may be used for reference.

A list of all published soil surveys may be obtained by writing the Information Division, Soil Conservation Service, Washington, D.C. 20250.

Requests for information pertaining specifically to soil conservation service photography should be addressed to: Director, Cartography Division, Soil Conservation Service, USDA Federal Center Building, Hyattsville, Maryland 20781.

IV. Additional Federal Agency Photography

Besides the Geological Survey and Soil Conservation Service, several other federal agencies regularly make extensive use of aerial photography. These include the Agricultural Stabilization and Conservation Service and the U.S. Forest Service.

Requests for information pertaining to Agricultural Stabilization and Conservation Service Photography should be addressed to a regional laboratory.

Orders for photographs of the following states should be addressed to: Western Aerial Photography Laboratory, Compliance and Appeals Division, ASCS-USDA, 2505 Parley's Way, Salt Lake City, Utah 84109 (Tel. 801/524-5856).

Arizona, Arkansas, California, Colorado, Hawaii, Idaho, Kansas, Louisiana, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, Texas, Utah, Washington, Wyoming.

Orders for photographs of the following states should be addressed to: Eastern Aerial Photography Laboratory, Compliance and Appeals Division, ASCS-USDA, 45 South French Broad Avenue, Asheville, North Carolina 28801 (Tel. 704/254-0961, Ext. 610).

Alabama, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, West Virginia, Wisconsin.

Requests for information pertaining to U.S. Forest Service Photography should be addressed to: Division of Engineering, Forest Services, USDA, Washington, D.C. 20250.

V. Conclusion

The interpretation of aerial photographs and soil surveys represents a tool for efficient, economical, and highly detailed landscape evaluation. It is hoped that the use of these new and ever expanding data sources will assist in providing socially acceptable decisions concerning the land development and valuation process.

The sources of information outlined in the paper do not begin to represent all the available information, either by agency or within agency. These information sources do represent an initial contact point from which other information concerning a particular area or problem can be identified if needed.

EROS Data Center Photographic Products Price List -- November 1972

Contact prints, enlargements and transformed prints are unmounted and untrimmed. The reproduction will be printed on standard paper stock unless the order specified other materials.

<u>PRODUCT</u>	<u>PRICE</u>	
<u>Black and white paper prints</u>	<u>1 to 25</u>	<u>Over 25*</u>
Contact prints:		
70 mm	\$ 1.25	\$ 1.00
5 in x 5 in	1.50	1.00
9 in x 9 in	1.75	1.25
10 in x 12 in*	2.50	2.50
20 in x 24 in**	3.00	3.00
<u>Enlargements:***</u>		
20 in x 20 in	3.50	3.00
30 in x 30 in	4.50	3.50
40 in x 40 in	9.00	8.00
<u>Black and white film transparency</u>		
Contact prints:		
16 mm (100 ft. roll)	15.00	15.00
35 mm (100 ft. roll)	20.00	20.00
70 mm	2.50	2.50
5 in x 5 in	2.75	2.75
10 in x 10 in	3.00	3.00
<u>Color paper print</u>		
Contact prints:		
70 mm	4.00	2.50
10 in x 10 in	7.00	3.00
<u>Enlargements:***</u>		
20 in x 20 in	12.00	9.00
30 in x 30 in	17.00	13.00
40 in x 40 in	25.00	20.00
<u>Color film transparency</u>		
Contact prints:		
16 mm (100 ft. roll)	20.00	20.00
35 mm (100 ft. roll)	25.00	25.00
70 mm	4.00	2.50
10 in x 10 in	7.00	4.00
<u>Enlargements:***</u>		
20 in x 20 in	15.00	8.00
30 in x 30 in	19.00	15.00
40 in x 40 in	27.00	22.00

	<u>1 to 25</u>	<u>Over 25*</u>
Transformed prints from either convergent or transverse low- oblique photographs	\$ 3.50	\$ 3.00

* Quantity prices apply only to those prints ordered in excess of 25 of the same size, i.e., 26 contact prints cost: 25 at \$1.75 each--\$43.75 plus 1 at \$1.25 - \$45.00.

** Photo indexes.

*** For an intermediate-size enlargement, use the price listed for the next larger size.

The EROS Data Center is located at 10th and Dakota Avenue,
Sioux Falls, South Dakota 57198, Telephone: 605/339-2270.

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LAND INVESTMENT SEMINAR
Sponsored by
Real Estate Educational Services, Inc.
The Christopher Inn, Columbus, Ohio
December 1, 1973
Instructor: Professor James A. Graaskamp
University of Wisconsin School of Business

Afternoon Session

- V. A thorough analysis of a market segment and a site opportunity as discussed this morning leads to a step for testing alternative development schemes for the site in question. These development schemes for the land planner are closely related to the prearchitecture program which is used to define the design program for the architect.
- A. The function of the preplanning program is to provide a specific definition of the space-time product in terms of quantity, features, and alternative scale and time which will permit conversion from space-time to money-time forecasts.
- B. The investment potential of land development eventually means buying a set of financial assumptions which converts a set of physical assumptions to outlays and receipts of cash. These assumptions must include:
1. Definition of desired profit centers (Appendix H)
 2. Definition of a timeline over which events will still take place
 3. Assumptions on the capital budget and sequence of source and application of funds
 - a. Direct construction or purchase cost
 - b. Indirect and capitalized carrying cost
 4. Assumptions on operating budget and sequence of source and application
 - a. Pattern of sales revenues
 - b. Pattern of sales and operating expenses
 5. Financing plan holding power
 - a. Credit amounts and terms
 - b. Equity amounts and terms
 - c. Holding power
 6. Profits classified as to type and tax
 - a. Cash from operations
 - b. Cash from capital gains
 - c. Cash surplus from financing
 - d. Cash from tax savings on other income
 - e. Cash from reduction or shift of fixed outlays
 - f. Indirect non-cash benefits
 7. Selected measures of profitability
 - a. Definition of investment
 - b. Definition of profit

8. Selected measures of risk
 - a. Payback periods
 - b. Capacity for variance
 - c. Variance control
- C. Some basic elements of a land investment model
(Appendix D - a computer terminal teaching model by EDUCARE)
- D. Since the planning process becomes a series of sensitivity studies which are attempting to balance product decisions with cash management decisions a more elaborate model is desirable which is capable of handling ever greater levels of detail as the project plan becomes more detailed. An example of such a model is provided in Appendix E. This model includes sub-models for:
 1. Capital budgeting in terms of modular cost units for both general and assignable costs
 2. A raw land inventory model
 3. A saleable product and finished goods inventory model
 4. A sales model adjustable by product absorption rate and time
 5. An accounts receivable model
 6. A financial package model
 7. A tax model
 8. A yield and risk model
- E. The impact of a new concentration of people and activities represented by a land development affects not only the physical environment but also the financial balance of the community affected. Fiscal zoning has always been attempted by simple minded concepts such as large lot zoning or exclusionary zoning and the courts have rejected these as "no growth" avoidance of government responsibilities to provide services or as discriminatory against lower income or minority group citizens. However, two very significant cases have demonstrated alternative controls which tie the developers cash flow directly to community budgets and capacities to provide services.
 1. The Ramapo New York plan in which the developer must obtain a permit to initiate an approved subdivision plan construction phase. The permit is only granted if the site scores a given number of points representing the availability of 5 municipal services. Community has established a master plan for land use and an 18 year capital budget for completing the required municipal services. The first six years are very carefully detailed and the developer receives points for services in line with the plan even if the community fails to complete construction on time. Nevertheless the tempo of development is tied to capital budget of the community and this approach has been approved by the New York Supreme Court.
 2. The alternative is impact zoning and the classic demonstration first appeared in House & Home in August 1972 as an article called "Impact Zoning" and then in October 1973 as "Here is a New System for Figuring Project Feasibility".
 3. Impact zoning considers four areas of impact:
 - a. Natural determinates and constraints of the site
 - b. Developers rate of marketing and capacity of the community to grow
 - c. Essential infrastructure of public services and community ability to supply them

- d. Municipal cash flow is the cost of servicing a new project vs. the tax revenue it will generate.
- 4. The system is developed by Rahnkamp, Sachs, Wells & Associates together with an attorney, Lenard Wolffe of Philadelphia.
- F. We are interested in the cash flow model which balances the municipal position against the developers cash position as demonstrated in Appendix F. Impact zoning can either be an explicit community program or the process of negotiating under existing subdivisions and planned unit development ordinances.
- VI. The concept of yield and risk is important as both a decision tool in accepting or rejecting a given plan but also in understanding the fine points of negotiation for both credit and equity financing.
 - A. The risk management process is both a philosophy of inquiry or of analysis and a systematic management process which is attempting to answer "WHAT IF...?" questions, to anticipate surprise, and to provide for response or adjustment in advance of the contingency. (WIBA case)
 - 1. Variance sometimes is a binary--yes-no question. You will or you won't receive zoning approval.
 - 2. Variance sometimes is the possible range around an average or a median--a distribution of alternative costs or revenue possibilities.
 - 3. Dynamic risks can produce profit or loss and are best controlled by the finesse of management execution of a plan.
 - 4. Static risks are those which can only cause a loss due to surprise upset of a plan.
 - B. Risk evaluation of comparison grows out of the function of risk management for an enterprise. Risk management has two objectives:
 - 1. Conservation of existing enterprise assets despite surprise events
 - 2. Realization of budgeted expectations despite surprise events
 - C. The process of risk management involves systematic and continuous:
 - 1. Identification of significant exposures to loss
 - 2. Estimation of potential loss frequency and severity
 - 3. Identification of alternative methods to avoid loss
 - 4. Selection of a risk management method
 - 5. Monitoring execution of risk management plan
 - D. Significant has to do with potential loss frequency, loss severity, and degree of uncertainty.
 - 1. Very frequent and minor become expense accounts
 - 2. Less frequent but predictable and major become reserves or budget allowances.
 - 3. Infrequent, uncertain but very severe become issues of risk management.
 - 4. A 50/50 probability is the most uncertain outcome.
 - 5. See Appendix G

E. The alternative methods of avoiding loss which everyone subconsciously uses include:

1. Eliminate risk exposure
2. Reduce frequency or severity of loss (mortgage loan closing process)
3. Combine risks to increase predictability (reserves for expenses)
4. Shift risk by contract (subcontracts or escape clauses)
5. Shift risk by combination by contract (insurance)
6. Limit maximum loss (corporate shell or limited partnership)
7. Hedging (sale and leaseback, options, contingent sales)

F. There are several useful financial ratios for measuring the residual risk which cannot be controlled through good business practice.

1. Rate of equity payback - the cumulative return of cash to equity investors over time divided by original cash investment plus value of personal endorsements on development liabilities.
(Relates to conservation of existing asset position)
2. Profit center ratio to gross receipts above the net income line-- dollar amounts of commissions, fees, and salaries with priority claim or payment before debt service and taxes.
3. Default point or cash breakeven point as a percent of potential gross cash receipts.
4. Potential foreseeable cash flow deficit as a percent of holding power reserve.

VII. There is no one measure of yield which is correct for all investors. The basic rule is buy low, sell high, and move fast. Any rate of return is simply a refinement for comparison purposes of the basic relationship of cost to sale price over time. Some useful measures of progressive sophistication are based on capital budgeting theory as used in corporate finance.

A. There are essentially two types of investors:

1. A conventional investment - one or more outlays followed by a series of receipts.
2. A nonconventional investment - one or more outlays interspersed with a series of receipts.

B. There are essentially three common decision types to be made by a review of investment yield:

1. Accept or reject decisions
2. Engineering comparison of alternative decisions
3. Marginal investment optimizing decisions

C. Some useful financial yield calculations related to three decision types:

1. Discounted value has the present value of the cash return to equity including tax savings of other income assuming liquidation at some future point in time - accept or reject.

2. The internal rate of return - that discount rate which makes the present net value different between the present value of the outlays and the present value of the receipt equal to 0. Engineering alternative comparisons for conventional investments.
3. Modified internal rate of return is the internal rate of return computed after converting outlays to the present value at the opportunity cost of money and compounding the receipts at the reinvestment rate of money - comparison of alternatives with different time lines for nonconventional investment or for marginal investment.
4. After tax cash on total cash or marginal cash investment on a year by year basis. Nonconventional investments or marginal investments (the tax trap problem).

COFFEE BREAK

- VIII. Land development income tax questions are greatly overemphasized by advisory services and so we are deliberately downplaying this aspect. Income tax advantages are tactical but not strategic investment objectives in land investment. It is the only reason for the investment the investor is doing himself, a piece of the environment, and society a big disfavor.
- A. The big problem in land development is avoiding dealer status with ordinary losses and ordinary gains for as long as possible or for some of the profit centers. There are two initial strategic factors to be recognized:
1. Is the major profit center the long term appreciation of land over base cost? If so, the vehicle should be structured to protect this capital gain.
 2. Is land development in one way or another a liquidation process for lands accumulated for other purposes - Section 1237?
 3. This section permits possible capital gains treatment of income from subdividing where:
 - a. Tax payer has investor status (not a dealer)
 - b. Tract has been owned for five years or acquired by inheritance
 - c. Seller has not or will not make any substantial improvement (including other controlled entities) to building of temporary structures, surveying, filling, draining, clearing, and construction of gravel roads are not considered substantial improvement. Where the tract has been held 10 years or more the installation of water, sewer, drainage, or hard surface roads will not be considered substantial if these are necessary for liquidation at full market value or land was acquired by foreclosure.
 - d. There are further limitations which limit capital gain treatment to first five parcels sold in the same taxable year which makes 1237 a very limited benefit but a possibility for the small project or developer.

4. An excellent source for the layman of tax information is:
Federal Taxes Affecting Real Estate by Arthur Anderson & Company,
 and distributed by National Institute of Farm & Land Brokers,
 155 E. Superior St., Chicago, Ill. 60611.

- B. The alternative methods of financing a land development should be regarded as primary risk management schools for the investor-developer and only to a minor degree as a leverage device as in mortgage lending on income property, etc. All forms of land financing will be expensive so the decision should really be made on loss control and cash flow management rather than leverage.

- C. You are aware of the spectrum of alternatives which are available in land financing but it's useful to look at them as risk controlled devices both from a development viewpoint and a money partner viewpoint.
 1. Secured credit for outright purchase
 - a. High risk to buyer
 - b. Escape hedge arrangement

 2. Land contract
 - a. Strict foreclosure only remedy
 - b. Segmented price formula
 - c. Down payment tailored for tax deductibility and long term spendable cash for seller
 - d. Release clauses with continuity clause, access, and shape restraints
 - e. Escrow arrangement with corporate trustee
 - f. Substitute collateral clause
 - g. Cooperation on public petitions, dedications, etc.

 3. Option to purchase
 - a. Same features as land contract
 - b. Prepurchase access in testing
 - c. Fixed damages for testing if option is not exercised
 - d. Conditions for extension should governmental action fail to meet option date with a finite extension term
 - e. Credit of option money against purchase price on incentive scale

 4. Rolling block option
 - a. Land development agreement to protect owner with incentive for developer
 - b. Developer and land seller must agree on a general plan, timetable, pricing, and annual rate of takedown
 - c. Purchase price formula with escalator
 - d. Preservation of developer freedom to walk away

 5. Land banking via an institution such as REIT
 - a. Care to avoid dealership taint
 - b. Rolling block option or sale and buyback plan
 - c. Default privilege of developer
 - d. Cumulative interest added to balance
 - e. Real estate tax added to balance
 - f. Limited release without release payment

- D. The institutional land banker has some major negotiation problems partly related to the fact that the institution wants to think like a lender and collect profits like a risk taker. Some of the problems are:
1. Control
 - a. Unanimity vs. majority approach
 - b. Day-to-day operations
 - c. Institutional inertia
 - d. Policy decisions
 - e. Institutional image
 - f. Development and construction
 - g. Management
 2. Buy-sell
 - a. Disputes or defaults
 - b. Appraisal vs. offer approach
 - c. Institutional "economic clout"
 3. Transfer of developer's interest
 - a. Personal relationship
 - b. Death
 - c. Bankruptcy
 - d. Sale of interests - SEC problems
 4. When does institution contribute?
 - a. Land purchase
 - b. Land development
 - c. Completion of improvements
 5. How much does institution contribute?
 - a. Ceiling on initial obligation
 - b. Priority to recapture contribution
- E. Syndication of land investment can be good or bad depending on purpose of syndication. Correctly used it can lower the default point by making interest or dividends to the limited partners contingent on earnings while giving passive investors limited liability and some tax pass through.
1. Repurchase price should be no more than developers loan ratio for construction and represents a "call" price.
 2. Sale of land to limited partnership with a buyback with limited remedies under a land contract amounts to a "put".
 3. Specification and clear thinking as to which profit center go to limited partners presumes a master plan and measurement of different profit centers before the fact.
 4. Limited partner format can provide an employee bonus system or broaden political structure constituency.
 5. Controlled liquidity by assigning 10% of earnings to a buyback fund for offerings by limited partner subject to a penalty and maximum annual repurchase ala Tejon Properties offering.

IX. New developments in federal law of land development

A. SEC guidelines for registration of syndications

B. Midwest Securities Administrators Association - MSAA have published a landmark policy statement which is being adopted by most midwestern states relative to real estate syndications and the sponsor-investor relationship. These guidelines are largely intended to curb conflicts of interest. They strictly prohibit:

1. Loans from the syndicate program to the sponsor;
2. Commingling of funds by the sponsor;
3. Exclusive agreements for resale of investment properties;
4. Commissions to the sponsor on reinvestment of investor funds;
5. Commissions to the sponsor (or an affiliate) on insurance policies protecting program properties; and
6. Rebates, kickbacks, and reciprocal arrangements benefiting the sponsor.
7. Other practices that are greatly limited include:
sales and leases of property between program and sponsor,
loans from the sponsor, exchanges, property management, and
other sponsor services

C. Office of Interstate Land Sales Registration has issued extensive revisions of their regulations.

1. Land sales volume in excess of \$500,000 or 50 lot sales in interstate commerce.
2. Condominium is equivalent to a lot and unless completed before sold or 2 years from date of purchase
3. Regulations recognize two categories of proposed amenities - obligatory and non-obligatory.
4. Signed receipt for property report
5. Specific standard for advertising copy
6. Deadline for filing Dec. 1, 1973
7. Trend to 5 acre lots or bigger to secure exemption

X. Suggested readings for land investment and development

1. Real Estate Securities & Syndication, Stephen E. Roulac, Editor, National Institute of Real Estate Securities, National Association of Real Estate Boards, Chicago, Ill. 1973
2. Federal Taxes Affecting Real Estate, Prepared by Arthur Andersen & Co., National Institute of Farm & Land Brokers of the National Assoc. of Real Estate Boards
3. Joint Ventures in Real Estate, by Aronshohn & Kaster, Real Estate Law and Practice Handbook #26, Practising Law Institute, New York
4. Joint Ventures in Real Estate -2D, by Appel, Leon, Roegge, Real Estate Law & Practice, Handbook #44, Practising Law Institute, N. Y.
5. City Planning & Aerial Information, by Melville C. Branch, Harvard University Press, Cambridge Mass.
6. Manual of Color Aerial Photography, American Society of Photogrammetry Ed. Smith & Anson, Fall Church, Va.

- X. Partnership organization for land development can take many forms depending on the priorities each partner might have for certain legal, tax, or management attributes.

A. Entities included in definition

1. General Partnerships
 - a. Definitions
 - b. Non-tax characteristics
 1. As an entity
 2. Mutual agency
 3. Delectus personarum
 4. Partner's interest in partnership; transferability
 5. Formalities
2. Limited partnerships
3. Joint ventures
4. Syndicates, pools and groups
5. Tenancy in common

B. Partnerships not taxes as partnerships

1. Election to be excluded from Subchapter K
2. Joint stock companies
3. Association

C. Non-tax reasons for partnership format

1. Corporate form may be illegal, improper, or not customary
2. Great flexibility in creating capital account
3. Great flexibility in profit sharing arrangements
4. Permits easy modification of profit ratios even retroactively
5. Flexible tiers of voting rights
6. Easy to organize, even by oral agreement (not recommended)
7. Unlimited liability or interference in management may not be significant for certain types of investment
8. Since 1960 corporations can be numbers of partnerships

D. Tax advantages and problems of partnerships

1. Generally
 - a. Conduit approach
 - b. Procedural
2. Disproportionate allocations of tax consequences
3. Basis -- limitation on losses -- subpartnerships
4. Partnership interest granted in consideration for services
5. Transactions between partner and partnerships; guaranteed payments
6. Sales of partnership interest
7. Shifting income to low-bracket relatives
8. Possible deferment of income
9. Employee fringe benefits
10. Collapsible partnerships: Dealers in real property
11. Organizational costs
12. State taxes
13. Carry-over of accelerated depreciation methods

E. Trusts

1. Non-tax factors

- a. Flexibility
- b. Limited liability
- d. Assignability
- d. Executed trusts
- e. Perpetuities

2. Tax features

- a. Flow-through of income
- b. Foreign tax credit
- c. Netoperating loss, depreciation and depletion
- d. Sales of beneficial interest
- e. Liquidation of a trust
- f. Grantor trusts
- g. Trusts taxable as associations
- h. Real estate investment trusts

F. Sub Chapter S Corporations

- 1. Limited liability plus some tax consequences with partnerships
- 2. Volatile status due to election requirements
- 3. Limitations on capital gains pass-through
- 4. Limitations on 10 U.S. residents
- 5. Limitations on pension or profit sharing plan
- 6. Limitations on transfer to a corporation, trust, partnership, or non-resident alien, all of which are disqualified shareholders
- 7. One class of stock
- 8. Limitation on passive income or rents to no more than 20% of gross receipts

Colloquium on Computer Applications in Real Estate Investment Analysis
University of British Columbia, February 1-2, 1968

SIMULATION MODEL FOR INVESTMENT PROJECT ANALYSIS
OF INCOME PRODUCING REAL ESTATE

Presented by
Professor James A. Graaskamp
University of Wisconsin, School of Business

I

INTRODUCTION

A. Origins

There is an interdependency of real estate marketing objectives, real estate financial planning, and physical features of project design which is seldom thoroughly tested in adequate detail for any rental project. Market, finance, and design considerations are generally not integrated in the conceptual stage of any project; instead each is isolated to advance the viewpoint of a specialist in one or another of these areas. The architect uses market research to justify a preconceived design, the finance man uses the architect to generate as much leverage from a revenue forecast as possible, or the market researcher begins his study with a preconception of an architectural style or a financial package. The appraiser is then asked to serve as economic interpreter of value making decisions already reached by the architect, tax accountant, lawyer, and consumer analyst.

The simulation model described in this report begins with the basic objective of integrating market data, cost estimates and financial constraints into a single abstract process for progressively testing project assumptions as plans become more detailed in order to achieve a better relationship of land,

improvements, and financing, to profit objectives. The model represents an accumulation of ideas defined in algebra by the author, given a logic system for the computer by Mr. Robert Knitter of the University of Wisconsin Computer Center, and then tested by graduate student problems and field applications. (1) The work was financed jointly by Lambda Alpha, the honorary fraternity of land economics, and the University of Wisconsin Bureau of Business Research. At this writing some further refinements are in process to increase the capacity of output formats, to improve mechanics of financing working capital deficits as incurred, and to improve the precision of capital gains tax calculations. It is then anticipated that the program on cards or tape, together with an operating manual, input forms, and sample projects, will be made available at modest cost to anyone wishing to use the model. (2)

B. Objectives

Since alternative design solutions to any investment project or alternative offering prices and financial plans for existing projects will affect investment return, it is necessary to trace out the consequences of each choice. A basic premise of the model is that the criteria of choice will concern cash flow to the investor over time and the present value of these expected cash returns discounted at a yield to equity required by the investor.

-
- (1) Graduate students Robert Markwardt and Tom Turk were primarily responsible for testing input forms, computer routines, and output format.
 - (2) The program is written in Fortran IV for an IBM 1410 with 40,000 character memory and utilizes 2 of 5 tape drives. Execution time of a run is 1-5 minutes depending on volume of outputs. While Fortran IV is compatible with many machine systems, our pilot model requires overlays which may involve some reprogramming to fit other hardware systems. A memory capacity of 120,000 characters would eliminate need for overlays.

The discounting process resembles the internal rate of return approach recently outlined by Professor Paul Wendt in the Appraisal Journal but with the addition of variable, after-tax period returns. (3) Development of cash flow for each period is a tedious, extended, and repetitious operation well suited to the computer. With such a financial review available to suggest implications of alternative decisions, the designer can better fit his solutions to the investor calculus while the investor himself will enjoy a more accurate prospective measure of investment yield. The output of this cash flow analysis has been molded:

- (1) To combine into one model a method of testing alternative designs for capital budgets, operating levels, and before and after tax yields over a time sequence.
- (2) To utilize the internal rate of return approach for variable period incomes while providing comparison to traditional and familiar appraisal methods and language.
- (3) To provide input forms which the average informed real estate investor or appraiser could complete ready for keypunching.
- (4) To generalize all formulas including present value calculations in order to adapt to the user choice of time period, project descriptions, and levels of detail while still permitting individualized labeling of descriptive elements of the outputs.
- (5) To anticipate possible expansion of the program in certain elements for special user needs without necessitating complete reconstruction of the program.
- (6) To adapt to relatively small computer installations available in most metropolitan areas at lending institutions or data service companies.
- (7) To provide outputs which summarize and analyze both the inputs and the outputs in forms familiar to the real estate investor and within an 8 1/2 by 11 page to allow insertion within the familiar standard written report form.
- (8) To provide a variety of analytical summaries to serve such users as architects, mortgage lenders, management strategists, marketing analysts and appraisers.

(3) Paul F. Wendt, "Ellwood, Inwood, and the Internal Rate of Return", The Appraisal Journal, October, 1967, page 561-574.

C. General Structure of Model

The basic structural concept of the model is to permit the analyst to define building blocks with which he can create alternative combinations of cost, operating characteristics, financial packages, and related cash flow dimensions. The basic building block is a component called a FEATURE, which can be given any kind of unit description, such as a square foot of area, a parking stall, a floor type, or even an entire building structure. The quantity of features used to describe any one project can be either varied or constant. VARIABLE FEATURES are combined into revenue generating elements, such as a one bedroom unit, or motel room, or office building floor. There may be different numbers of RENTAL ELEMENTS in a rental class, ranging from one element defined as a package of one site/one building to a rental mix of as many as 9 different types of apartment elements in different quantities in the same building. Rental elements not only have quantity and cost dimensions but a revenue and expense dimension as well. Aggregate quantities and cost determinations by the computer determine budget, capital structure and various measures of design efficiency. Aggregate revenue and expense calculations by the computer provide a basis for income, expense, and cash flow analysis as will be illustrated in detail in following sections. Period cash flow to the investor is then a basis for investment valuation.

A simplified flow chart is given in Chart 1 to suggest the type of outputs which can be generated if full details are available. However it should be emphasized that it is possible to generate valuable information from the sketchiest data. For example, a simple allocation of an offering price between building, equipment, and land where annual rent and expense ratios are known can produce a significant answer, although much additional marginal analysis of useable area efficiency, rental mix, or accounting accuracy will not be available for lack of required input. As frequently

CHART I

SIMPLIFIED FLOW CHART
OF
WISCONSIN REAL ESTATE INVESTMENT SIMULATION MODEL

INITIAL DATA INPUTS

1. feature unit cost
2. quantities of features in each rental class
3. rent, expense, and occupancy factors
4. indirect capital costs
5. capital financing schedule
6. capital depreciation schedule
7. time index adjustment factors
8. real estate and income tax data
9. appraisal and yield data



PHYSICAL IMPROVEMENT DATA PRINTOUTS

Total Quantity and Cost of Component Features

Feature Quantities and Costs of Rental Element Types

Indirect Capital Costs

Total Capital Finance Plan

Capital Depreciation Plan

Key Financial Structure Ratios

Key Physical Improvement Ratios

Simple Marginal Analysis Comparisons of Rental Mix

CASH FLOW DATA PRINTOUTS

Standard Income and Expense Statement

After Tax Cash Flow Statement

Net Worth Summary

Standard Financial Ratios

Current and Cumulative Yield Comparisons



INCOME APPRAISAL & YIELD PRINTOUTS

Summary of Capital Investment, Mortgage and Land Cost Data

Present Value of Income and Reversion Before Recapture or Financing at 7 Discount Rates Selected By Investor

Present Value of Income and Reversion With Consideration of Debt Service But Before Taxes at 7 Discount Rates Selected By Investor

Present Value of Income and Reversion After Allowance For Debt Service and Income Taxes at 7 Discount Rate Selected by Investor

Land Residual Value For Site Using Each of 3 Approaches to Property Residual Value at 7 Discount Rates

as desired by the analyst, the model will then appraise period cash income and resale values by means of three different value approaches which can be classified as traditional, mortgage-equity and after-tax methods. Both the property residual and land residual values for all three approaches at seven different discount rates are given to facilitate comparison of results and decisions on the range of returns to be expected.

The model may be termed heuristic, for it runs through a single set of inputs and stops without searching for an optimal solution. Since the combination of alternative inputs is infinite, it is presumed that the analyst has narrowed his choices to a limited set of practical alternatives on the basis of his own judgment and experience. The product of the model is an extension of decisions already made or modified as a result of previous runs on the computer. It lacks the glamour of an optimizing model or decision making model, but it is doubtful that the art of real estate investment can either be made conclusively mechanistic or could be accepted as such by practitioners if it were. Any model builder must anticipate the resentment any computer system generates among real estate practitioners, and this model deliberately avoids infringing on matters of "judgment".

II.

CAPITAL BUDGET AND FINANCIAL STRUCTURE

A. Project Features

The flexibility of this project simulation model can be suggested by reference to the input forms which appear in Appendix I and output forms which are inserted as Charts II - VII. Both sets of information describe some hypothetical 40-unit apartment building. The basic building block is a FEATURE, which can be divided between features which will vary for each rental element and those which are constant for any one run of the model. The name of such features and the unit of description is limited only by the imagination of the analyst and 20 card spaces. In the example on

page 1 of Appendix I and Chart II, there is a square foot of living area, but the unit might have been one entire floor plan type of an office building. For the example functional areas are described by the square foot "SF", furniture by the piece "PC", and outside parking by the stall "STL". The first 10 features may vary for each type of rental element while the number of parking stalls for the project has been limited by the design to a constant of 40 units. Public area for corridors, lobbies, and whatever else the designer might define as public, has been limited initially to a constant ratio of 1 square foot of public area for each 5 square feet of rentable space, indicated by .2. Each feature is given two essential dimensions:

1. DIRECT COST PER UNIT is the essential piece of information which determines the detail level for any one project run. It is possible to allocate the offering price for an existing property between building, equipment, and land if that is the only cost data available. If more is known about cost, any type of unit definition is possible. If costs include indirect charges such as engineering fees, then it is unnecessary to include these items in the indirect cost input forms. The unit could be the price of the entire site or could be land per square foot at the discretion of the analyst. Furniture could be by piece, per room, per apartment or per floor depending on the flexibility of detailing desired or available to the analyst.
2. CSC - CAPITAL SCHEDULE CODE is a means of classifying each kind of feature according to the method of its financing or the formula for its tax depreciation. Rentable space is always classified as CSC #1, non-rentable space as CSC #2, and land as CSC #3 to allow

CHART II

REAL ESTATE CAPITAL STRUCTURE & BUDGET

PAGE 3

PROJECT FEATURES - COMPONENTS

CODE		PER UNIT	ADDITIONAL UNITS CONST.	PER REA	TOTAL UNITS	COST	
1	LIVING ROOM	SF	6.500	.000	8976.0	58344.0	
2	KITCHEN	SF	15.000	.000	4088.0	61320.0	
3	BEDROOM 1	SF	6.500	.000	5796.0	37674.0	
4	BEDROOM	SF	6.500	.000	2794.0	18161.0	
5	FOYER	SF	6.000	.000	996.0	5976.0	
6	STORAGE	SF	10.000	.000	2210.0	22100.0	
7	FURNITURE	EA PC	50.000	.000	72.0	3600.0	
8	BASEMENT STORAGE	SF	4.500	.000	1900.0	8550.0	
9	LAND	SF	1.500	.000	55200.0	82800.0	
10	BATHROOM	SF	20.000	.000	2184.0	43680.0	
11	PUBLIC AREA	SF	7.000	.000	5788.8	40521.6	
12	OUTSIDE PARKING STL		300.000	40.000	.000	40.0	12000.0
TOTAL DIRECT CAPITAL COST						394726.6	

CHART III

REAL ESTATE CAPITAL STRUCTURE & BUDGET

PAGE 4

RENTAL ELEMENTS

RENTAL CLASS TYPE 1		NUM.	RENT	FIXED EXPENSES		VARIABLE EXPENSES	
EFFICIENCY APT		4.	120.00	1.20	.02	1.50	.02
FEATURE - COMPONENT			#UNITS	COST		AREA	
1	LIVING ROOM	SF	300.00	1950.00	37.6%	300.00	67.7%
2	KITCHEN	SF	50.00	750.00	14.4%	50.00	11.2%
6	STORAGE	SF	20.00	200.00	3.8%	20.00	4.5%
8	BASEMENT STORAGE	SF	25.00	112.50	2.1%	25.00	5.6%
9	LAND	SF	800.00	1200.00	23.1%	.00	.0%
10	BATHROOM	SF	48.00	960.00	18.5%	48.00	10.8%
TOTAL				5172.50		443.00	

RENTAL CLASS TYPE 2		NUM.	RENT	FIXED EXPENSES		VARIABLE EXPENSES	
1 BEDROOM APT		14.	140.00	1.70	.02	1.50	.02
FEATURE - COMPONENT			#UNITS	COST		AREA	
1	LIVING ROOM	SF	216.00	1404.00	18.2%	216.00	32.8%
2	KITCHEN	SF	108.00	1620.00	21.0%	108.00	16.4%
3	BEDROOM 1	SF	161.00	1046.50	13.5%	161.00	24.5%
5	FOYER	SF	74.00	144.00	1.8%	24.00	3.6%
6	STORAGE	SF	50.00	500.00	6.4%	50.00	7.6%
8	BASEMENT STORAGE	SF	50.00	225.00	2.9%	50.00	7.6%
9	LAND	SF	1200.00	1800.00	23.3%	.00	.0%
10	BATHROOM	SF	48.00	960.00	12.4%	48.00	7.3%
TOTAL				7699.50		657.00	

RENTAL CLASS TYPE 3		NUM.	RENT	FIXED EXPENSES		VARIABLE EXPENSES	
2 BEDROOM APT		16.	160.00	2.20	.02	1.50	.02
FEATURE - COMPONENT			#UNITS	COST		AREA	
1	LIVING ROOM	SF	216.00	1404.00	14.7%	216.00	26.4%
2	KITCHEN	SF	108.00	1620.00	16.9%	108.00	13.2%
3	BEDROOM 1	SF	161.00	1046.50	10.9%	161.00	19.7%
4	BEDROOM 2	SF	127.00	825.50	8.6%	127.00	15.5%
5	FOYER	SF	30.00	180.00	1.8%	30.00	3.6%
6	STORAGE	SF	65.00	650.00	6.8%	65.00	7.9%
8	BASEMENT STORAGE	SF	50.00	225.00	2.3%	50.00	6.1%
9	LAND	SF	1600.00	2400.00	25.1%	.00	.0%
10	BATHROOM	SF	60.00	1200.00	12.5%	60.00	7.3%
TOTAL				9551.00		817.00	

RENTAL CLASS TYPE 4		NUM.	RENT	FIXED EXPENSES		VARIABLE EXPENSES	
2 BEDROOM FURNISHED		6.	180.00	2.20	.02	4.00	.02
FEATURE - COMPONENT			#UNITS	COST		AREA	
1	LIVING ROOM	SF	216.00	1404.00	13.8%	216.00	26.4%
2	KITCHEN	SF	108.00	1620.00	15.9%	108.00	13.2%
3	BEDROOM 1	SF	161.00	1046.50	10.3%	161.00	19.7%
4	BEDROOM 2	SF	127.00	825.50	8.1%	127.00	15.5%
5	FOYER	SF	30.00	180.00	1.7%	30.00	3.6%
6	STORAGE	SF	65.00	650.00	6.4%	65.00	7.9%
7	FURNITURE	EA PC	12.00	600.00	5.9%	.00	.0%
8	BASEMENT STORAGE	SF	50.00	225.00	2.2%	50.00	6.1%
9	LAND	SF	1600.00	2400.00	23.6%	.00	.0%
10	BATHROOM	SF	60.00	1200.00	11.8%	60.00	7.3%
TOTAL				10151.00		817.00	

the computer to calculate building efficiency, land improvement ratios, and other related items. Beyond this minimum classification restraint the analyst may have as many as six additional capital schedule classifications as there are financing methods and depreciation schedules as will be further described below.

B. The Rental Element

The RENTAL ELEMENT is defined by combining various quantities of features. For example on Chart III in the demonstration project there are 4 rental elements, efficiency apartments, one bedroom apartments, 2 bedroom apartments and 2 bedroom apartments furnished. There can be as many as 9 elements consisting of various quantities of 10 different variable features. Each type of element is given a code number, and for each run of the computer it is necessary to specify the quantity of each type of element in the rental mix. The quantities of features per element multiplied by the number of elements and then summarized for all elements aggregate to the total quantity and cost of each feature which are added to constant feature costs to obtain total direct capital cost. This breakdown of rental elements allows the investor to test different mixtures of rental elements, modification of feature specifications in each element, and distinct element costs relative to rents and expenses for each. The definition of a rental element and its name tag are left to the discretion of the analyst. It could be as limited as an entire building investment defined as a combination of 3 features - building, equipment and site or as a rental package such as a full floor of office space plus parking spaces, or 1,000 square feet of retail space and one parking stall, or a single revenue unit such as a theater seat, motel room, a table for four, or a display window. Each rental element has an income and an expense dimension found on page 2, Appendix I and Chart IV:

1. RENT PER PERIOD is the gross rent for one rental element of each rental class type. It is important that all calculations related to time have the same common denominator. If mortgage payments are to be calculated for a regular monthly payment mortgage, then rents must be stated per month. If the rental class type is simply defined to include an entire building as a single type, then the rent must be given for the gross expected from all rental elements in the building. In this illustration there are 4 efficiency apartments each renting for \$110 per month.
2. FIXED EXPENSES refer to those expenses that are constant in any one period regardless of occupancy. These expenses can be stated as a fixed amount per period (a month in this case) for each rental element or they can be determined by relating expenses per square foot to the total area enclosed by a single element. Some services offer expense cost per square foot of rental area and some developers maintain records in similar fashion. The aggregate fixed expenses for any one period consist of the number of units for rent times the expense per unit plus the number of square feet for rent or rented times so many cents a square foot.
3. VARIABLE EXPENSES are designed to fluctuate with occupancy. The expense item may be constant for each period or per square foot or a combination of both. The variable expense for each unit times the number of elements in each rental class times the occupancy factor for each rental class as explained further in III-D is combined into the period expense statement which is printed as part of the operating income summary.

Each rental element is analyzed in terms of quantities, costs, and areas of those feature components which were used to define the element as in Chart III. Total cost for a single rental element represents direct cost only and is allocated as a percentage to each feature item as well. Area allocations include only those features classified by the capital schedule code number #1 for rentable area or #2 as nonrentable area. Quantities of features in each rental element multiplied by the number of each element are then summarized in Chart II and then given as an aggregate cost labeled total direct construction cost. Accuracy of the descriptive word "direct" depends on the ability of the analyst to describe feature unit cost with precision as distinct from accounting definitions of indirect cost for carrying charges, professional fees and the like during construction.

C. Indirect Capital Budget Allowances

The TOTAL CAPITAL BUDGET is a summary of all direct costs on the capital schedule and provision for indirect costs which would be capitalized. Reference to page 3 of Appendix I reveals a card for INITIAL EXPENSES, those items of indirect cost and carrying charges which should be allocated to the capital budget rather than initial operation. These expenses can be introduced as a fixed amount, as a percentage of the first period rents, or as a percentage of direct capital cost or as any combination of these three. Engineering fees, insurance costs, and other related items of work, and premiums paid for financing might be expressed as initial fixed amounts or as a percentage of cost. Expenses expressed as a percentage of rent would generally refer to marketing costs related to renting projects or carrying the project during the start-up period. If the loan ratio is a high percentage of the direct capital cost, then the discounts and loan fees could be expressed or converted to a percentage of cost base. The

CHART IV

REAL ESTATE CAPITAL STRUCTURE & BUDGET

PAGE 5

CAPITAL SCHEDULE

CODE #-CAP. SHCED.	DEPRECIATION %BASE TERM METH	MORTGAGE / FINANCING %BASE TERM INTEREST	PAYMENT	TOT. COST
1 BUILDING RENTABLE	100. 480. 2.00	80. 300. .50%	1318.52	255805.00
2 BUILDING NONRENTABLE	100. 480. 2.00	80. 300. .58%	228.29	40521.60
3 LAND	. . .00	80. 300. .58%	466.48	82800.00
4 PARKING	90. 120. 2.00	80. 300. .58%	67.60	12000.00
5 INITIAL EXPENSES	90. 480. 2.00	80. 300. .58%	276.24	49032.66
6 FURNITURE	100. 72. 2.00	90. 60. .66%	65.57	3600.00
TOTAL PERIOD DEBT SERVICE			2422.71	
TOTAL CAPITAL BUDGET				443759.26

TOTALS

IMPORTANT RATIOS

TOT BLDG AREA TBA	34732.80	BLDG EFFICIENCY TRA/TBA	83.33%
TOT RENTABLE AREA TRA	28944.00	GR PER UNIT AREA GR/TRA	\$.21
LAND COST LC	82800.00	BLG COST/UNIT TCB-LC/TBA	\$10.39
TOT IMPROV COST TCB-LC	360959.26	DEBT RATIO TM/TCB	80.0%
TOT CAP BUDGET TCB	443759.26	LAND RATIO LC/TCB	18.6%
TOT DEPRECIABLE BASE DB	354855.99		
TOT MORTGAGES TM	355367.40		

MISCELLANEOUS EXPENSE INPUTS

R.E. TAXES .20% OF TOTAL CAPITAL BUDGET PER PERIOD

PLUS \$.FIXED DOLLAR BASE

ANNUAL INCOME TAX RATE- 30.0%

INITIAL EXPENSES- \$ 5000. FIXED, PLUS 75.00% OF FIRST PERIOD RENT

PLUS 10.00% of DIRECT CAPITAL COST

advantage of such a treatment would be that financing charges would adjust automatically as the scale of the project or design changes modify direct capital cost and size of loan. Initial expenses must be given a capital schedule code number and can be financed, and depreciated individually or as part of other items on the schedule code. For those expenses which can be charged against operating income during the initial periods of operation, it is possible to introduce those into the operating statement by use of time index factors to be discussed later in III-D of this report.

III.

CASH FLOW INPUTS AND ANALYSIS

A. General Expense Items

In addition to rent and direct costs related to each rental element, there are expenses related to the overall project and demands on cash for financing charges, amortization, income taxes, and returns to the equity investor. General expense items which are not easily charged to any one rental class would include:

1. PROPERTY TAXES stated as a fixed amount per period for an existing property investment or as a percentage of capital cost for proposed project where design elements may change for each run of the computer. In either case the tax computed represents only the initial period property tax for this amount is modified in future periods by the time index factor for real estate taxes. To determine the rate of the property tax per period it is important to convert the property tax rate in any community to a cost of replacement base, then reduce for the community equalization factor, and then divide by the number of periods per year appropriate

to the period chosen for the model. The basic tax calculation is applied to total capital budget to determine the basic tax for the initial period, but this basic tax can be modified by the index factor discussed below to recognize long term trends towards rising property taxes in any particular community or short term adjustments due to relationship of completion dates to assessment dates, partial assessments during construction, or other abatements appropriate to the project. Such tax adjustments need only be related to the tax base and then introduced by use of the index factor.

2. Tax deductible expenses related to initial marketing efforts or inefficient operations during the shakedown period can be introduced by modifying the normal operating base figures for fixed and variable expenses with the index factor device.
3. Short term working capital deficits for expenses which are not capitalized through the indirect capital cost category are assumed to be financed at a specified interest rate called working capital loan interest (WK. CAP. LOAN) on page 3 of Appendix 1. Short-term loans are only amortized by full application of net after-tax cash income and no spendable cash is assumed to be available for the investor until working capital loans are repaid. This assumption has been made explicit in the model under preparation for publication and will appear on the outputs as indicated on the dummy output in Chart VI.

B. Mortgage Finance

The financing for each component of the capital schedule code is specified on page 3 of Appendix 1. In the model now being programed, period calculations will be internalized to simplify inputs to annual figures only but for the present:

1. % RATIO refers to the ratio of the loan to capital budget and not to appraised value. In the day of certified cost, this is not an unreasonable assumption. Where the capitalized value of the project design finally selected indicates additional mortgage money is available and the default ratio is low, the ratio in this column can be changed to produce a higher mortgage figure for the final analytical run of the program.
2. TERM of the mortgage is the amortization period for level payment mortgages. The time period factor must be consistent with the period chosen for analysis, just as in determining useful life for depreciation. If mortgage financing is to be on a monthly basis, then this mortgage term is stated in months and all other time factors for the model must also be available in months, including rent, expenses, depreciation, real estate taxes, and time index factors. If mortgage payments are to be quarterly, all other time related factors must also be quarterly.
3. INTEREST is stated as the interest per period chosen for mortgage payments. It may refer either to level term mortgages or to CONSTANT PAYMENT mortgages where an even dollar amount can be specified for payment on principal each period. The generalized formula for amortization on a level payment basis is built into the program so that separate interest and principal payments on each financing component are calculated for each period. Each interest item and principal item is then aggregated for print-out on the period summaries of interest and principal as required.

C. Provisions for Income Taxation

In addition to tax deductible cash expenses, the income tax computation involves determination of non-cash charges for depreciation, determination of net taxable income before and after cumulative tax loss carry-forwards, and capital gain taxes upon sale of the building.

1. DEPRECIATION requires a statement of the percentage of each capital schedule code class which can be depreciated, that is 100% less expected salvage value. The useful life of the class is described as the TERM in periods, defined to be consistent with the common time denominator of all period entries. ACCOUNTING METHOD refers to the accounting modification of straight line depreciation to be used by the investor. The computer begins by calculating straight line depreciation per period and then multiplies this figure by the factor chosen to determine depreciation per period. Straight line depreciation would be indicated by 1.0, 150% declining balance by 1.5, 200% declining balance by 2.0 or any other factor for the depreciation plan. The computer does not use the sum-of-the-digits method.
2. INCOME TAXES are expressed as a percentage of net income. The rate can be an average of the marginal rate paid by the investor in this range of income; it may combine federal and state rates, or can reflect a weighted rate for a corporation or syndicate of investors. Capital gain tax computation is necessary to determine after tax cash returns to the investor upon resale, and extension of the Ellwood technique to after-tax problems. In the present model the approach has been simplified by always using one half

CHART V

REAL ESTATE CAPITAL STRUCTURE & BUDGET

PAGE 6

MARGINAL ANALYSIS BY ELEMENT CLASS

	GR	TRA	TCB	%INC/%COST
TOTAL PROJECT	6080.00	28944.00	443759.26	

AS A % OF TOTAL

EFFICIENCY APT	7.89%	6.12%	6.06%	130.20%
1 BEDROOM APT	32.23%	31.77%	31.56%	102.13%
2 BEDROOM APT	42.10%	45.16%	44.77%	94.04%
2 BEDROOM FURNISHED	17.76%	16.93%	17.60%	100.92%

GROSS INCOME	6	36480.00	RESALE VALUE	465947.22
EFF. GROSS %OCC.OF	25.%o	9120.00	LESS PRIN.BAL.	352188.38
LESS FIX. EXP.	4803.60		NET WORTH	113758.84
LESS VAR. EXP.	3923.28			
LESS R. E. TAX	5325.11		CURRENT PD. RETURN	-.200221
NET INCOME		-4931.99	PROJECT RETURN	-.15131
LESS DEPREC.	10019.06		PRODUCTIVITY RATE	-.0105
LESS INTEREST	11357.26		CASH RETURN	-.2202
TAXABLE INCOME		-26308.32	EXPENSE RATIO	.385
TAX OFFSET	-22871.01		DEFAULT RATIO	.783
LESS TAXES	.00		DEBT COVER RATIO	-.339
PLUS DEPREC.	10019.06			
LESS PRIN. PMT.	3179.0		CUR. PRIN. PMT/CUR.DEPREC.	.317
CASH INCOME		-19468.30	TOT. AMOR./TOT. DEPREC.	.317

the income tax rate on the taxable gain on sale. The taxable gain is computed simply by subtracting the undepreciated balance of total capital budget from resale value, without adjustment for disallowed accelerated depreciation in excess of that recognized by the 1964 IRS code. The program now in process is attempting to calculate readjusted depreciation for capital gain purposes without loss of flexibility as to time period denominator. Nevertheless, it should be emphasized that it was not felt necessary to compute the full marginal tax schedule with accounting accuracy as the model is designed to forecast rather than provide for historical accounting.

3. To apply income tax loss carry-forwards to taxable income, it is necessary to instruct the computer as to the number of periods in which to accumulate negative taxable incomes before the potential tax credit expires. The input position follows directly on the statement of the income tax rate to be applied to taxable income on the bottom of page 3, Appendix 3. For a model assuming a monthly time denominator, a permissible five year carry-forward would require specification of a 60 period moving total of negative taxable income. As the real estate project is assumed to stand alone without complementary income sources, a full tax loss offset would generally be applied to future income from the project. If the investor wishes to apply taxable income loss offsets to other income, it is only necessary to carry forward enough periods in a model to represent one taxable year.

D. Time Index Factors Adjustments

Revenue and cost inputs in dollars to this point represent base period figures which may be adjusted by Indexes per period for rent, real estate taxes, fixed expenses, variable expenses, resale price, and occupancy by rental element class. Indexes give the model a means of recognizing the time line of development, rentup periods, and the various cycles of revenue cost and resale values (See III-G) which characterize dynamic real estate investment. There is no necessity that the base period for the cash flow items above be the first month of normal operation. Revenues may be held to zero during a construction period while fixed costs gradually rise to an operational level, shakedown, and only then reach the normal point indicated for fixed and variable expenses. Rental revenues can begin at zero build as occupancy improves, and then reflect changing price levels by changes in the rent index. Beginning with the assumption that the time unit for the index is the same period chosen for mortgage amortization, it is only necessary to make assumptions as to the cycle of the index numbers for each category so to account for each period in sequence to the point where the computer is to stop computations:

1. BASE PERIOD need not be the first month of normal operation. It simply marks the beginning of cash flow analysis as opposed to capital outlays for development. It is necessary to indicate the next base period each time the index changes and to finally indicate where the computer is to stop computations by placing a 99 in the base period column. The analyst may have as few or as many period outputs and index adjustments as desired.
2. PER CENT OF BASE assumes that original cash flow inputs represent an index of 100 and that the analyst can cycle these items over time

CHART VI

DUMMY FORMAT OF CASH FLOW STATEMENTS FOR SECOND GENERATION REAL ESTATE INVESTMENT ANALYSIS MODEL

REAL ESTATE CAPITAL STRUCTURE & BUDGET

GROSS INCOME	6	33600.	RESALE VALUE	425453.
EFF. GROSS OCC. OF	25%	8400.	LESS PRIN. BAL.	321239.
LESS FIX. EXP.	4804.		LESS WK. CAP. LOAN	18474.
LESS VAR. EXP.	3923.		NET WORTH	85740.
LESS R.E. TAX	4862.		CHANGE IN N.W.	2940.
NET INCOME		-5189.		
LESS DEPREC.	9374.		CURRENT PD. RETURN	.0021
LESS INTEREST	10273.		PROJECT RETURN	.0342
TAXABLE INCOME		-24537.	PRODUCTIVITY RATE	.0121
TAX OFFSET	-21320.		CASH RETURN	.0000
LESS TAXES	0.		EXPENSE RATIO	.404
PLUS DEPREC.	9074.		DEFAULT RATIO	.796
LESS PRIN. PMT.	3011.		DEBT COVER RATIO	.090
CASH INCOME		-18474.		
WORKING CAP. LOAN	18474.		CUR. PRIN. PMT/CUR. DEPREC.	.321
CASH TO INVESTOR		0.	TOT. AMOR./TOT. DEPREC.	.321

GROSS INCOME	12	33600.	RESALE VALUE	425453.
EFF. GROSS OCC. OF	82.%	27720.	LESS PRIN. BAL.	318228.
LESS FIX. EXP.	4804.		LESS WK. CAP. LOAN	18378.
LESS VAR. EXP.	3923.		NET WORTH	88847.
LESS R.E. TAX	4862.		CHANGE IN N.W.	3107.
NET INCOME		14131.		
LESS DEPREC.	8703.		CURRENT PD. RETURN	.0132
LESS INTEREST	10178.		PROJECT RETURN	.0362
TAXABLE INCOME		--4750.	PRODUCTIVITY RATE	.0332
TAX OFFSET	-28946.		CASH RETURN	.0000
LESS TAXES	0.		EXPENSE RATIO	.404
PLUS DEPREC.	8703.		DEFAULT RATIO	.796
LESS PRIN. PMT.	2916.		DEBT COVER RATIO	1.079
CASH INCOME		1037.		
WORKING CAP. LOAN	-17437.		CUR. PRIN. PMT/CUR. DEPREC.	.345
CASH TO INVESTOR		0.	TOT. AMOR./TOT. DEPREC.	.333

by stating the index as a percentage of the initial input. For example experience may indicate that real estate taxes will rise an average of 2% a year for a 5-year investment term. So for the first 12 monthly periods real estate taxes will have an index of 100, for the next 12 periods an index of 102, then 104, etc.

3. ENDING PERIOD defines the length of time the index on any one line prevails for each of the categories. It is possible to vary the ending period in any way so long as the time unit is consistent. For example during the rentup period it might be desirable to vary the occupancy factor every 3 months; during the initial years of normal operation, revenue and cost might be held constant for 2 years at a time, and then after the fifth year inflationary or deflationary expectations could be indicated yearly. In short occupancy might vary significantly over short periods initially; revenues and expenses might shift at different rates over the intermediate term reflecting less elasticity of rent than expenses; and resale values may shift with alternative assumptions as to inflation, local markets, and economic obsolescence.

E. Capital Budget Output Analysis

Once all of these inputs are available, some useful outputs may be at hand. In addition to the cataloging of input data and assumptions for those who read the final outputs which appear in Charts II - IV, (4) some useful computations begin to make their appearance on Chart IV, i.e. some totals and ratios relative to the scale of the project. The captions on these summary statements are self-explanatory and of course the calculations involving area can only be performed where some of the feature components are defined in terms of floor area and are classified as either #1 or #2 in the capital

(4) In addition there are complete checks on card inputs and sequence areas which have been omitted from the charts.

schedule code. Some simple marginal analysis of these totals as on Chart V is possible for those projects where rentable area can be allocated to various rentable classes and a further limiting assumption can be made that there should be a relationship of gross rental power to total capital budget allocated to each rental class. In this analysis the gross rent and rentable area allocations are easily identified from the data concerning each rental class detailed on Chart II. The total capital budget is allocated to each rental class according to the proportion of direct cost per class generated from element cost times number of elements.

1. The revenue power of any one rental class relative to the others in the project is then suggested by the ratio of the percentage of total income generated to the percentage of total capital budget allocated to that rental class. To a lesser extent the percentage of gross rent generated relative to the total rentable area allocated also measures the efficiency of investment in any one type of rental class.
2. For example, in the results on Chart V, efficiency apartments provide 7.9% of gross revenue rental potential while occupying only 6.1% of total rentable area and requiring about 6% of the total capital budget, suggesting 32% more income per dollar spent than would be realized by investing in two-bedroom furnished apartments. By the same token the investor is alerted that two-bedroom apartments (unfurnished) either offer too much space or too many features as represented by the total capital budget allocation for the rent money charged. Either the plan is too generous or the rent too low. Presuming rents are established from the market, the inference is that the architect has been somewhat liberal with features and investment in this rental class. Of course,

such analysis could be modified if rental class rents were adjusted to reflect different vacancy levels or tax free cash returns as modified by furnishings, etc., or where rental elements were known to have significantly different expense ratios.

Of course the final standard of capital budget expenditures is the relationship of capital cost to investment value as examined later in the paper.

F. Cash Flow Outputs

An income statement summary and an analysis of current results is one major basis for investment evaluation. The program can be instructed to compute income and expense figures per period, and aggregate results until summary is requested for print-out. In this example on Chart V, the computer was instructed (See page 3, Appendix I) to summarize monthly results each six months and then to appraise these results assuming resale every five years (60 months). In this case gross income represents potential revenue while effective gross represents net rents received for each rental class as adjusted by the occupancy index. Per cent of occupancy is a calculation derived from $\$9,120/36,480$ and is not the per cent of occupancy assumed for six months. It is the weighted average of monthly results. The balance of the cash flow statement has been derived and aggregated from the inputs examined earlier and appears in a format on Chart V which should be self-explanatory.

Cash income footing in the present model does not go far enough for purposes of analysis, and so the need for short term loans to cover working capital deficits has been made explicit. All cash deficits will be accumulated in the new version as in Chart VI and then paid off from future cash income before cash is made available to the investor. Cash available to the investor after all claims on cash flow have been met are assumed to be distributed

CHART VII

REAL ESTATE CAPITAL STRUCTURE & BUDGET

PAGE 10

APPRAISAL ANALYSIS OF PROJECT

INITIAL COSTS- TCB 443759.26, LC 82800.00, TIC 360959.26
TM 355367.40, CASH EQUITY REQUIRED 88391.86

VALUE BASED ON INCOME USING THREE DIFFERENT APPROACHES

PRESENT VALUE OF RETURNS, LESS \$ 360959.26 TIC, EQUALS RESIDUAL LAND VALUE

PROPERTY APPRAISAL				LAND APPRAISAL		
%	TRADITIONAL	B/4 TAX	AFT TAX	TRADITIONAL	B/4 TAX	AFT TAX
5.20	542198.24	524148.12	489343.50	181238.98	163188.86	128384.24
6.00	523655.74	517638.56	483982.25	162696.48	156679.30	123022.99
7.00	501446.92	509846.21	477567.92	140487.66	148886.95	116608.66
10.00	440778.58	488587.02	460088.98	79819.32	127627.76	99129.72
12.00	404833.93	476013.48	449767.30	43874.67	115054.22	88808.04
15.00	356838.93	459256.30	436032.93	-4120.33	98297.04	75073.67
20.00	290283.65	436096.17	417100.09	-70675.61	75136.91	56140.83

GROSS INCOME	66	40128.00	RESALE VALUE	510323.14
EFF. GROSS %OCC.OF	96.%o	38522.88	LESS PRIN.BAL.	314422.77
LESS FIX. EXP.	5283.96		NET WORTH	195900.37
LESS VAR. EXP.	4315.60			
LESS R.E. TAX	5857.62		CURRENT PD. RETURN	2.12408
NET INCOME		23065.69	PROJECT RETURN	.05451
LESS DEPREC.	7037.79		PRODUCTIVITY RATE	.0451
LESS INTEREST	10144.84		CASH RETURN	.0809
TAXABLE INCOME		5883.04	EXPENSE RATIO	.385
TAX OFFSET	-.01		DEFAULT RATIO	.737
LESS TAXES	1764.91		DEBT COVER RATIO	1.630
PLUS DEPREC.	7037.79			
LESS PRIN. PMT.	3998.04		CUR. PRIN.PMT/CUR.DEPREC.	.568
CASH INCOME		7157.88	TOT. AMOR./TOT.DEPREC.	.443

as dividends. It is this cash dividend in each period which is discounted as an internal period return to arrive at present value of the income for the mortgage-equity approach and the after tax mortgage-equity approach.

G. Net Worth Analysis and Investment Yield

With every cash flow statement there is a review of net worth prior to a statement of yields according to various investment theories. Resale value represents total capital budget as modified by the depreciation time-index factor. This time factor may represent a number of elements in investment expectations. Should the investor also be the contractor whose profits and overhead were not included in the capital budget, the resale index could reflect an immediate write-up of value. Of course resale value should always be stated as net of any brokerage or resale costs, to represent liquidating cash value of the project. If total capital budget were presumed equal to market price, the resale value index might be 95% to reflect 5% transaction costs. With an index less than one, net worth will always reflect the true equity cushion and the change in net worth will reflect the maximum cash recovery potential of cash used to reduce the balance of debt. After such initial adjustments by means of the resale index, the index can be used to indicate market recognized depreciation or appreciation of the property. In this way taxable income can reflect tax definitions of depreciation while investment yield will reflect anticipated true erosion of capital, if any. Any index of resale value is an arbitrary, prospective assumption, but once other variables in the model have been decided upon, the final runs of a project can be based on a resale index assuming the most probably foreseen up-side and down-side value fluctuations in order to produce a definition of yield range expectations similar to the graph in Ellwood.

Net worth is resale value less the balance due on debt on the capital schedule code and short term working capital loans. For some measures of investment yield we are interested in discounting change in net worth from the previous reporting period as well as cash flows and remainders. These relationships will be made more explicit in the format on Chart VII.

IV

INCOME YIELD AND APPRAISAL VALUATION

A. Criteria of Investment

Investment in rental real estate is presumed to be conditional on a satisfactory rate of cash dividends per period and capital gain on resale consistent with investor determination of risk and alternative investment opportunities. This model offers several criteria for dividend evaluation, for discounting capital gains, and for comparing alternative investment yields. The model presumes that the discount rate chosen by the investor makes adequate allowance for risk and so the risk factor is left implicit. However the same tools for portfolio management by means of probability statements (as discussed by Gerald Work at this symposium) in the next generation of investment models. Of course cost and revenue estimates with probability dimensions presume statistical data banks on these items such as some of the large life insurance investors in real estate are beginning to collect. However, for this model the final judgment as to whether rate of return in any of the forms given is adequate must be made by the investor for the model says nothing objective about risk.

B. Dividend Yield Measures

Reference to Chart V will indicate a number of period yield calculations. In reading the model returns, it is important to remember that the yield is for the six month period summarized and must be multiplied by two to approximate an annualized rate of return. In the program now in process, the computer

will automatically annualize the yield figures to state them in a form more familiar to the investor. To meet various investor needs, yield determinations are made as follows:

1. CURRENT PERIOD RETURN is measured by adding spendable cash for the period (one month) to the change in net worth from the previous period and then dividing by net worth at the beginning of the period. Change in net worth is overstated whenever the index on resale value changes in an upward direction, thus jolting current period returns from its previous pattern.
2. PROJECT RETURN is a moving aggregate of the previous six periods for each of the elements in the current period return calculations. The reason for this adjusted rate of return is to smooth out the rate pattern due to changes in the resale value index in any single period. This ratio may be the most significant analytical tool of the model for it measures when and to what degree the rate of return is falling or rising as leverage and tax cover decline and the liquidating value of the equity grows due to amortization and inflation. It could suggest timing of refinancing or resale.
3. PRODUCTIVITY RATE is the traditional measure of rate of return on invested capital, calculated by dividing net income before interest or depreciation by the total resale value of the property. It is a measure of the overall capitalization rate on invested capital and a reciprocal of this figure would represent the net income multiplier.
4. CASH RETURN is a direct ratio of cash income for the investor after all claims in cash have been received for the period divided by net

cash originally invested, that is the difference between total capital budget and total mortgage financing, thereby offering a measure of cash dividend returns to the investor.

C. Financial Ratios

For the mortgage lender and the tax accountant cash flows are also analyzed in terms of the expense ratio to gross income, the default ratio including expenses and debt service as a percent of gross income, and a ratio of net income available for interest and principal payments. For the tax accountant there is a ratio of principal payments to total depreciation cover to suggest how many tax free dollars are absorbed by loan payments, or conversely, what portion of the depreciation shelter is available for cash to the investor.

D. Appraisal of Investment Value

The final standard of investment performance is the relationship of the sum of all discounted returns to the investor to the total capital budget necessary to create the investment opportunity. The analysis of this relationship as defined for the model is demonstrated on Chart VII. This type of analytical output is produced as often as required by the investor, and in this case was triggered for seven selected discount rates at the end of each five years or ten six-month summary cash flow statements. The required input instructions can be seen on the bottom of page 3 of Appendix I. Instructions for printout appear under the PERIODS OF PROJECTION - income statement and valuation statement. Bases for rate of return, in this case 5.2 to 20%, are stated as an annual rate or nominal rate and then reduced to a rate per period by instructing the computer as to the number of periods in a year--twelve in the example.

The output format for present value analysis as seen in Chart VII then provides a review of total capital budget, land cost, total improvement cost, total initial debt, and cash equity required to facilitate comparison with present values derived for each of seven discount rates. It is important to note the distinction in the language which describes this process as appraisal of investment value because this value is only true for a very specific set of design, financing, and tax assumptions and may not reflect market price in any way. It suggests only the highest price which an investor might pay under the specific conditions set and still realize the rate of return specified for the equity position. The property residual type of appraisal in the first three columns minus the total improvement cost contemplated produces the residual land value in the right hand three columns. Selection of the proper investment mix of input variables by the individual investor could involve a matrix of criteria such as that investment which produces the highest land value in excess of \$82,800 at no less than 12% return after taxes, has the lowest cash equity required, and has a total capital budget of less than \$450,000. In addition, there could be other dimensions relative to loan ratio, default ratio, expense ratio, dividend yield, etc.

The present value methods can each be described as follows:

1. The TRADITIONAL discount method is the present value of each period net income, including negative income periods as negative values, plus the present reversion value of the net resale price. As in traditional appraisal theory there is no recognition for interest or taxes on income, and recapture of investment is at a rate implicit in the Inwood process. As the equity rate is applied to

the total income, there is naturally a sharp reduction in value of the total project with each increase in the discount rate. In this case a discount rate of about 9% would produce an investment value about equal to the total capital budget required, suggesting that the project has an overall rate of return on capital of about 9%, a result consistent with the annualized productivity rate calculated per six month period earlier.

2. The B/4 TAX discount value is shorthand for an approach similar to the Ellwood mortgage-equity approach to value (5) and the textbook view (6) but computed with variable incomes (7) rather than the normalized income to which weighted average capitalization rates or split rates are applied. The method computes the present value of net income less interest and principal payments each period plus the present value of the reversion to equity (resale less mortgage balance due), the sum of which is added to the original balance of total mortgage debt. As presently constructed, it treats periods of negative income by adding a negative present value for each period to the present value sum for the periods, an approach which introduces a significant distortion in value where cash deficits are prolonged over many periods or appear in the later stages of the projection period to be appraised. Deficit cash flows should appear as an addition to total equity required or as a compounding charge against other positive period returns. It is for this reason that working capital loans to meet any period of negative cash income were introduced as in Chart VI to charge future income with the

(5) L.W. Ellwood, Ellwood Tables, Second Edition, American Institute of Real Estate Appraisers, Chicago, 1967.

(6) Richard U. Ratcliff, Real Estate Analysis, McGraw-Hill Book, Co., New York, 1961; See Chapter VI.

(7) Paul F. Wendt, Op. Cit.

interest cost of borrowed money and to reduce the reversion value by the full amount of the debt rather than a discounted value of the debt.

3. AFTER-TAX valuation of returns to equity represents a further departure from current income appraisal methods. This value represents the total present value of cash to investor (which is reported after taxes) per period plus the present value of net worth. In this case the net worth is the undepreciated balance of the investment less the capital gains tax computed less mortgage balance and short term loans due at the end of time of sale. To this present value product is added the value of the original mortgage debt, which of course is the present value of debt service payments excluded in the determination of spendable cash. The productivity of short term capital is implicit as interest for the money was charged to taxable income and repayment was made prior to determination of spendable cash or net worth remainders.

The array of values for seven alternative rates of return and three methods of discounting makes it possible to estimate equivalencies as between traditional, mortgage equity, and after-tax rates of return. For example in this case a 9% overall rate of return is equivalent to about an 18% return to equity before taxes and a 14% return to equity after taxes. These can be derived through interpolation of these results or through modification of selected rates of return and a second run of the model. These equivalent yields make it possible to compare the real estate investment to specific alternative investment opportunities in real estate, bonds or stocks.

V.

APPLICATIONS OF A SIMULATION MODEL

A. Design Analysis

The simulation model has been tested in a number of actual investment situations. It has worked best as an analytical tool in its present form on a student housing project in which student rooms were a standard, modular product, and where room shortage was such that the building was fully rented as soon as completed at well established contract rates. The investor-developer was very knowledgeable on cost of construction and operation and his costs were based on the modular unit.

Effective design analysis with this model assumes that the designer has reliable cost per unit estimates, though these need not be elaborate. The typical apartment builder is often unable to distinguish the cost of bathroom space and livingroom space. His only modular cost figure is \$9.33 per square foot of gross area on his most recently completed 16-unit building. The model would work using that simple cost figure, but more detail may be desirable for feasibility analysis of critical alternative design decisions.

For example, on one project involving a pair of apartment towers, the engineer had designed a standard square shaft for elevator, stairway, circulation corridor and utility core for the center of each square tower. This center portion was given a constant cost for 10 floors. The issue was then to test several floor plans for the rentable area. In addition to basic structure costs, we added the cost per running foot of sound wall, interior apartment partitions, carpeting, tile, and cabinetry. There was also a square foot cost for exterior wall and window. Four different towers in terms of gross floor area and typical apartment floor plans were tested to choose the best design concept for further refining.

For those seeking a computer model to test economic feasibility in the office of the architect or engineer, the model suggests a measure of feasibility more sophisticated than holding cost within a budget or to an overall rate of return. For example it would be possible to reduce the basic building block of features into further sub-sets of 10 cost items each, or additional sub-sub-sets making it possible to handle quantity costs for as many as 1,000 individual items. Further refinement of the time index feature would permit simulation of the impact of alternative critical paths of development on investment value or the desirability of staged development. These expansions of the basic model would require more computer capacity than we can command on no research budget, but the possibilities are well anticipated in a recent book on the dynamics of cost, time, and value of engineering-construction projects by John W. Hackney, entitled Control and Management of Capital Projects.⁽⁸⁾ Such a model does more than discipline the designer within the constraints of cost, time, cash flow, and value. Rather than holding to a clients budget, the designer is permitted to challenge the budget assumption itself, using variable revenue projections of the client and his experts, the cost expertise of the architect and the property manager, and the financial criteria of those committing capital to the project. How often has an architect or packaging developer presented his proposal in terms of values generated by the concept of internal rate of return on fluctuating cash flow?

B. Purchase Offer Analysis

The simulation model has been used to scan multiple listing offerings and develop offering prices which will produce a certain level of return

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

upon implementation of a property management plan by the investor. Recent debate on component capitalization methods such as the Ellwood method has served to remind the real estate investor to provide for his profits as an explicit factor in determining his purchase bid. There is an old adage in real estate to the effect that profit is made because you buy well rather than because you sell dear. A cursory review of a listing sheet, inspection of the property, and some knowledge of the market should make it possible to define the opportunity in terms of a possible purchase offer, allocated to features identified as improvements, site, equipment, and additional \$100 units of remodeling or furnishing required. Given knowledge of appropriate rents, operating ratios, and financing terms, it would be possible to frame a financial outline of several alternative offers which would suggest the range of bargaining and the impact of alternative offers on rate of profit.

C. Mortgage Loan Application Analysis

Many lenders today screen loan applications with Ellwood method capitalization of income estimates to determine if the value derived will support the loan amount requested and the cost of the project as estimated. However, correlation of this income method and the cost approach based on normalized income is no assurance of the financial sanity of the project or the adequacy of equity resources of the developer. A model which analyzes cash flow deficits during rentup and the shifting demands on cash of the income tax burden gives a better picture of financial risk than current methods using static normalized income statements. Moreover, rate of return to equity and the residual value of the land based on alleged costs is a more revealing measure of investor motivation and credibility. With increasing interest in long term equity accumulation by those lenders seeking equity

participation in exchange for favorable financing, there is greater desire to scrap the assumption of normalized income in favor of forecasting period incomes shifting with changing operating ratios, price levels, and after-tax residuals.

D. Government Policy Analysis

One of the most interesting applications of the model to date has been to test the likely result of Madison density zoning bonus features for high density multi-family districts. With the aid of another University of Wisconsin computer model (9), all the sites zoned R-5 and R-6 have been identified in a 300 square block area around the University which can be acquired in different price ranges, such as \$5-6, \$6-7, and \$7-8 a square foot. One of our graduate students has designed modular standard efficiency, one, and two bedroom apartments with costs for several alternative construction methods. Test sites for each standard design building class with different rental mixes are being run with the model to determine how many apartment units could be built at a cost related to student rentals which would justify the estimated land cost. It should then be possible to project the maximum supply of rental units which might be built by 1975 for private profit under different FAR maximums under various provisions in the code on available supply of sites. For example, the standard FAR is 2.0 with a 50% site coverage assumption, 3.0 FAR with 30% site coverage (thereby requiring elevator construction) and 3.6 FAR under a controversial bonus provision to encourage construction of student apartments. First results indicate that it is virtually impossible to realize much financial advantage from these bonuses unless one owns a minimum of 3 lots - i.e. 99 X 132 feet. We can measure

(9) A model developed by Richard Garrigan of University of Wisconsin Construction and Planning Department to forecast group purchase prices of selected properties for institutional budgeting of future property assemblages.

the increment in plottage value with considerable precision and the likelihood that the value of existing improvements on given sites would encourage purchase and redevelopment. As an alternative to zoning bonuses for student housing, it will be possible to test the influence of 40 year financing through a state agency or of real estate tax modifications as stimulants to student housing, given current level of site acquisition costs.

E. Application to Valuation Theory

The investment model outlined here is simply the model-T of the next generation of valuation models for real estate. The thrust of these models might take several directions, including generations of new forms of capitalization rates, specialized models for specific real estate development problems such as subdividing, simplified models for use by real estate brokers, data bank models to generate comprehensive operating data, and finally better dynamic combinations of the design-construction-valuation process.

It should be possible to build tables of capitalization rates which add to the Ellwood coefficients some recognition of the influence of depreciable asset ratios to total value at progressive steps in the income tax rates. One of our graduate students suggested a set of nomographs for this purpose and prepared and illustrated an example. A computer program related to graphic output analysis might produce basic nomograph sets for common investment ratios.

At the University we are already building a model for land development investment analysis and pondering on a point of connection between investment model constraints and the constraints of the Land Use Intensity graphs of FHA multi-family performance standards. With time we would like to develop a model in which capital costs, revenues, expenses, and resale values

could be given range estimates with a probability distribution which in turn could produce probability statements on the rate of return expectation for equity as suggested at this symposium by Gerald Work of the Wells Fargo Bank. Dynamic investment models can modify planning theory, urban land policies of government agencies attempting to channel private investment activity, and investigation of the true cost of building code obsolescence, design forms without function, or consumer idiosyncracies.

One tenet of appraisal valuation theory deserving close examination is that of the three independent approaches to value, the market comparison, the income and the cost approaches, which should all converge on the same conclusion as to value. Rather than a correlation of these three disparate views of value, why not a synthesis of the valid elements of each of these traditional methods into a single approach to value by means of a dynamic simulation model? Revenue is estimated by market comparison of rents and prices of comparable properties. Market analysis and consumer surveys might provide data on the relationship of rents and amenities for the commodity "rental space". The engineering cost approach might be the source of capital budget and operating budget data, which would determine outlays of revenue. Defining revenue to include all cash receipts whether from equity, mortgages, rents, or resale, it would be possible to match revenues with outlays over time to determine net productivity. This productivity could be discounted by the capitalized income approach which would best characterize investor patterns of financing, taxing, and profit taking. It is more logical to correlate revenues, outlays, and profits over a sequence of time periods than it is to rationalize differences between three independent unrelated static valuation methods. Could it be that appraisers must use static

models to derive long term values because methods are not available to practitioners for treating mathematically the large number of variables in a more sophisticated, dynamic model of long term values? Could it be that the obvious lag in appraisal technique relative to investment technique has encouraged lawyers, architects, engineers, planners, and amateur investors to presume expertise in matters of investment analysis?

A dynamic model for evaluation of the design-time-finance constraints of real estate investment might provide a common denominator for economic feasibility to be shared by all of these groups. Certainly it could provide discipline and sophistication to professional education in the many fields which bear on real estate investment.

IBM

GENERAL PURPOSE CARD PUNCHING FORM

PAGE 1 OF

JCB

PUNCHING INSTRUCTIONS

WRITTEN AS:

FEATURE NO. _____
NUMBER _____

DATE _____

ORIG.
COST/
UNIT

C ADD'L FEATURE
S UNITS

C	CONSTANT	PER RENT.
		ELEM. AREA

FEATURE NAME

[illegible]

PUNCHING INSTRUCTIONS

WRITTEN AS:

[illegible]

JOB

PUNCHING INSTRUCTIONS

WRITTEN AS:

BY

DATE

E P PERCENT OF BASE
N R RENT TAX EXPENSES RE-
D D FIXED VAR SALE

PERCENT OF OCCUPANCY
BY RENTAL ELEMENT

1 2 3 4 5 6 7 8 9

1-10 11-20 21-30 31-40 41-50 51-60 61-70 71-80

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
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1	9	9																																																	

99

19 APARTMENT RENT - FURNISHED + UNFURNISHED WITH ACCELERATED DEPRECIATION