

REAL ESTATE FINANCIAL FEASIBILITY ANALYSIS  
AMERICAN BREWERY CASE STUDY

by

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(ABSTRACT)

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Financial feasibility analysis is an essential component in the increasingly complex real estate development process. Participants in that process who expect to have an impact on the shape and nature of the built environment must develop a basic understanding of this form of analysis.

This thesis will describe financial feasibility analysis, introduce a computer model that measures the financial performance of a proposed real estate development, and document the use of the computer model with a case study. It is hoped that this thesis will be a practical resource for the students and faculty in the College.

## Acknowledgments

The Real Estate Analysis Model I instruction manual, which appears in Appendix A, is chiefly the result of an effort by Tim Williams, with editorial assistance from James C. Canestaro and myself. In addition, Tim Williams' computer expertise has been a fast, accurate, and indispensable resource.

I would like to thank James C. Canestaro, Norman T. Brinkman, and Walter Butke for serving on my thesis committee.

Most importantly, I would like to thank Brigid for her assistance and support. Her efforts have made this endeavor far more enjoyable.

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## CHAPTER 1

### INTRODUCTION

#### Background

The real estate development process has become increasingly complex, extending into areas as diverse as land planning, marketing, law, and finance. Consequently, students of architecture and building construction who expect to become integral parts of this process must become familiar with these subjects. This thesis is intended to fulfill part of that need; it will explain the role of financial feasibility analysis in the overall mosaic of real estate development.

Real estate financial feasibility analysis is the process of evaluating the financial performance of a proposed development concept for a specific location. The results of this analysis are used by prospective participants as a justification for participation or nonparticipation in a proposed development. The architect or contractor who has a basic understanding of this process will have greater control over a development's final outcome and the knowledge to avoid financially unsound projects.

Financial feasibility analysis involves translating assumptions, such as building budgets or the demand for office space, into data that can be quantitatively measured and evaluated. This data is then used in calculating complex equation routines, which are easily handled by computer simulation. The Real Estate Analysis Model I is a computer

program that was designed as a tool to help students understand the basic financial structure of real estate developments.

### Real Estate Analysis Model I

During the past year, the Real Estate Analysis Model I (REAM I) has been under development. The REAM I model will calculate and display the following information: mortgage amortization schedule, depreciation schedule, before and after tax cash flows, reversions, and rates and ratio analysis. The REAM I model is very easy to operate and requires little or not computer experience. The user is prompted in English for all data inputs and desired outputs. An instruction manual describing the operation of REAM I appears in Appendix A.

The development and testing of REAM I was a long and complicated endeavor that constitutes an important part of this thesis. Testing the model involved hand calculating all of the REAM I schedules for a test case, and then, with the aid of a computer programmer, correcting errors in the program's logic to insure its accuracy in calculating and displaying output data.

Each of the REAM I output schedules presents information that influences a real estate development's financial feasibility. Below is a brief description of those schedules.

1. Mortgage amortization schedule: The mortgage amortization schedule calculates the periodic payment of a mortgage loan. A portion of the payment is for interest and the balance for repayment of the original loan principal (amortization). The schedule contains five

columns: annual debt service, interest payment, principal amortization, remaining mortgage balance, and debt coverage ratio.

2. Depreciation schedule: The depreciation schedule calculates the deductible expense for an investment or business property which reflects the presumed loss in value due to age, use, or obsolescence. The output schedule contains the following columns: depreciation claimed, straight line depreciation value, excess allowable depreciation over straight line, cumulative excess allowable depreciation, and remaining depreciable basis.

3. Before tax cash flow: Before tax cash flow is the actual spendable income after paying all operating expenses and debt service. This calculation does not include the income tax liability or tax savings resulting from the cash flow. The before tax cash flow schedule contains the following columns: net operating income, annual debt service, before tax cash flow, principal amortization, depreciation deduction, and taxable income.

4. After tax cash flow: After tax cash flow equals before tax cash flow minus any tax liability, plus any tax savings on other income. The after tax cash flow will vary depending on the individual investor's income tax bracket. This schedule includes five columns: before tax cash flow, income tax liability, tax savings on other income, investment tax credits, and after tax cash flow.

5. After tax reversion: Reversion is the resale proceeds received by the investor at the time the project is sold. After tax

reversion is calculated by subtracting resale costs, outstanding mortgage balance, and taxes due at time of sale from the resale price.

6. Rates analysis schedule: This schedule displays the following investment performance measures on a before and after tax basis.

Cash rate of return -- The ratio of cash flow to the investor's original contribution.

Internal rate of return -- The actual rate of return which includes cash flow and reversion from resale of the project.

Payback -- A measure of the amount of investor's original contribution that has not been returned as cash flow benefits to the investor.

7. Ratio analysis schedule: The ratio analysis schedule displays the following investment performance measures on a before and after tax basis.

Net worth -- Net worth is the estimated reversion for a particular year. It measures project solvency at the time of resale.

Net present value -- The net present value is the investor's original contribution, minus the present value of annual cash flows and reversion, discounted at the investor's desired rate of return.

Cost benefit ratio -- This represents the ratio of the present value of annual cash flows and reversion, discounted at the investor's desired rate of return, to the investor's original contribution.

An example of the above output schedules for the American Brewery Case Study appear in Appendix C.

### Organization of the Thesis

This thesis is presented in the following manner:

Chapter I describes the purpose of the thesis and introduces the background and major schedules of REAM I.

Chapter II introduces the role of financial feasibility analysis in a real estate development and the participants most interested in that analysis.

Chapter III documents the use of REAM I in determining the most financially feasible use of the American Brewery from among three alternatives.

Appendix A provides an instruction manual describing the operation of REAM I.

Appendix B presents the American Brewery Case Study REAM I inputs and the calculations used to derive them.

Appendix C presents the REAM I outputs of the most financially feasible use of the American Brewery, as determined in the case study.

## CHAPTER 2

### REAL ESTATE FINANCIAL FEASIBILITY ANALYSIS

#### Definition

Real estate financial feasibility analysis is the systematic evaluation of the likely success of a development concept for a specific location. The factors that constitute success - cash solvency, rate of return, and level of risk - are measured by the development's potential participants to determine the feasibility and value of their participation. A development is considered worthwhile if the analysis indicates that the major factors meet or exceed preestablished targets.

The following factors are analyzed by a project's developer, lender, and investor.

Cash solvency occurs when a project's revenue, in the form of rent or lease payments, is sufficient to cover vacancy, operating expenses, and debt services.

Rate of return is a measure of the profit that accrues to the investor; it is also used to compare the value of different investments.

Risk is the difference between the project's intended solvency position and rate of return, and the actual results.

#### Real Estate Development

Real estate development is the process that results in the creation of constructed space. It requires the skill and knowledge of many

individuals, the expenditure of vast sums of money, and the consumption of large spans of time. This process begins with a development concept that is slowly shaped by the constraints of the local real estate environment. The concept can eventually become a building if all the constraints prove to be reasonable; otherwise, the concept is considered infeasible.

The wide range of constraints that influence a development require careful analysis and monitoring. This enables their dynamic character to be synthesized into an understandable and controllable state. In practice no single study encompasses all of the financial issues discussed in this chapter. Instead these issues are analyzed in several studies: financial feasibility, appraisal, market, and investment.

The role of financial analysis can be more easily understood if the development is viewed as an investment (see Figure 1).

CF0 is the initial equity investment that launches a project.

CF1 and CF2 are negative cash flows that may require additional investment by the investors.

CF3 and CF4 represent positive cash flows that pass through to the investors.

CF5 is the project's reversion value at the time of sale.

The total investment value of a real estate development involves the following items: "cash flow, tax shelter, property appreciation, principal build-up, and the original equity investment."<sup>1</sup>

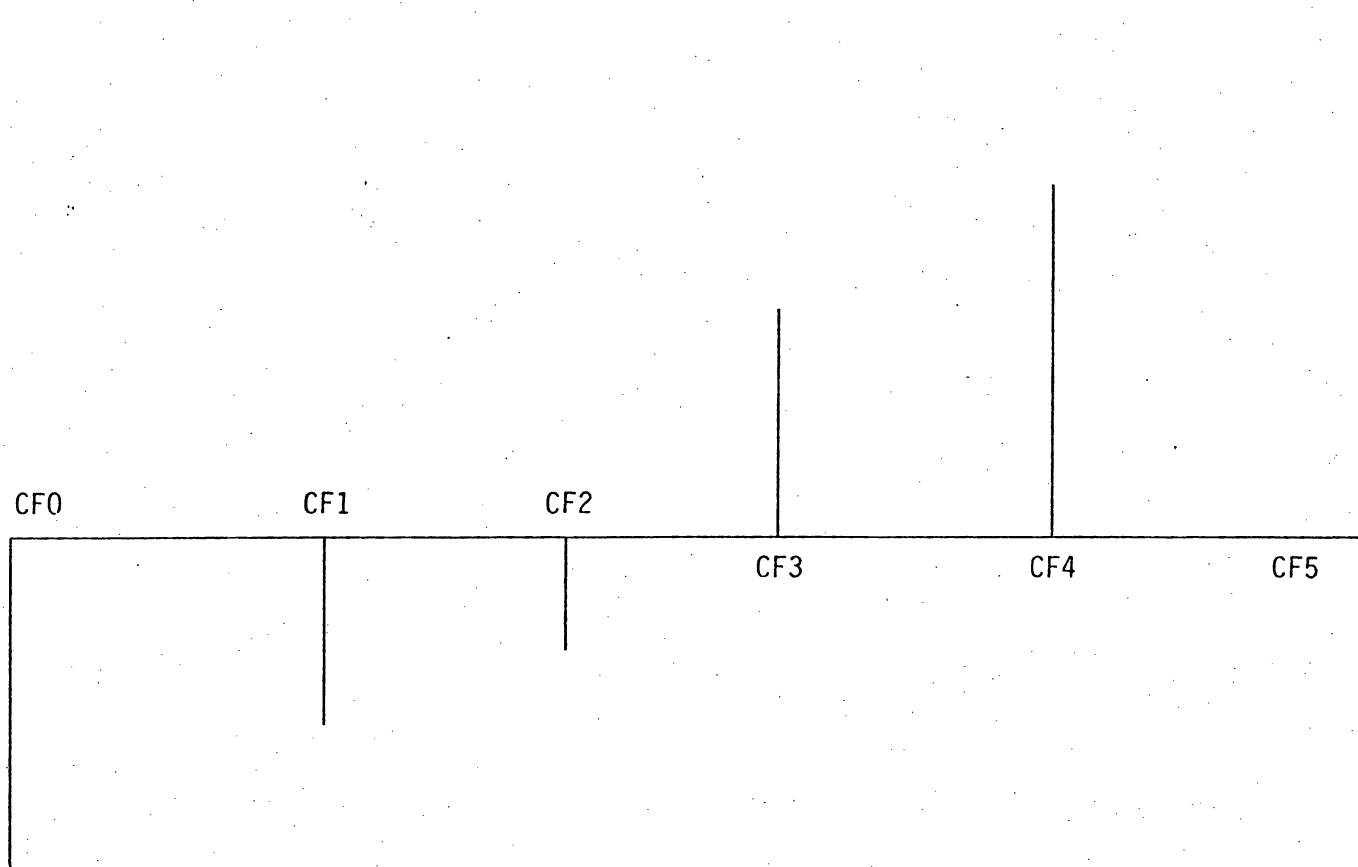


Figure 2.1. Real Estate Investment.

## Major Participants

Many of the participants in a real estate development must be aware of the project's financial condition, for example, the general contractor and government officials. However, the developer, investor, and lender require extremely accurate information about the project's solvency, rate of return, and level of risk.

Developer. The developer initiates the development concept or is hired at the beginning of the project by investors who lack the necessary expertise. The developer's involvement depends on individual experience, ability, financial resources, and compensation objective. If the developer determines the project to be feasible, he promotes it to lenders and investors to raise sufficient financing. Next, the developer oversees the project's construction with the aid of a construction manager or an architect. Once the project is complete, the developer may choose to manage it, or sell it and move on to the next project.

The developer's compensation can come in two forms. If he is hired by investors, the developer is paid a fee for the amount of time dedicated to the project. If the developer participates as an equity investor he will receive a percentage of the profits proportional to his share of the investment.

Investor. An investor puts money into a development with the hope of receiving back the initial investment plus a profit that is commensurate with the level of risk involved. The range of investor participation varies greatly. An active investor can be either the

developer, or a member of a joint venture that offers financing and some form of expertise, such as a lawyer or an accountant.

A passive investor simply invests money in the development and "is interested in maximizing profits during the period of operation and at the time the project is sold."<sup>2</sup> This investor may be an individual purchasing a small interest in a development through a limited partnership or real estate investment trust, or an insurance company or commercial bank purchasing an entire project. Equity investors may enter an investment before or after it is constructed.

Lender. The lender provides funds to the development in exchange for repayment of the loan principal plus interest. The preestablished interest rate is based on the level of risk associated with the development and the current demand for borrowed funds throughout the economy. Most real estate development loans are secured, which means that if the borrowing party is unable to repay the loan as agreed to, he must give the deed for the land being developed to the lender.

The lender is involved in two stages of a development. First, the construction lender, usually a commercial bank or savings and loan association, provides financing during the project's construction. Second, the permanent lender provides the loan that is used to repay the construction loan. The permanent loan is repaid, with interest, in monthly installments until the principal is retired. The loan term may extend for 15 or more years. The permanent loan interest rate is lower than the construction loan because the risk decreases considerably once the building is complete.

In recent years it has become common for these roles to change. For example, commercial banks that used to assume the more conservative role of lender are beginning to seek equity investor positions. The reason former lenders are accepting the larger risks associated with equity investment is because of the larger profit potential.

### Financial Analysis in the Real Estate Development Process

Figure 2 depicts the life cycle of a real estate development in seven stages. The left column lists the sequence of events in a real estate development, and the right column describes the role of financial analysis in each stage.

During any stage in a development, the developer may consider the project infeasible. At that point, the developer's options are to

1. make the necessary changes and proceed with the development, or
2. stop the development and accept total loss, or
3. sell the incomplete project.

The following descriptions are simplified but complete.

1. Concept Stage. Real estate developments begin with a concept that fits into one of the following situations:

1. a use in search of a site, or
2. a site in search of a use, or
3. an investor in search of an investment.<sup>3</sup>

To proceed with a development, the concept must meet solvency, risk, and

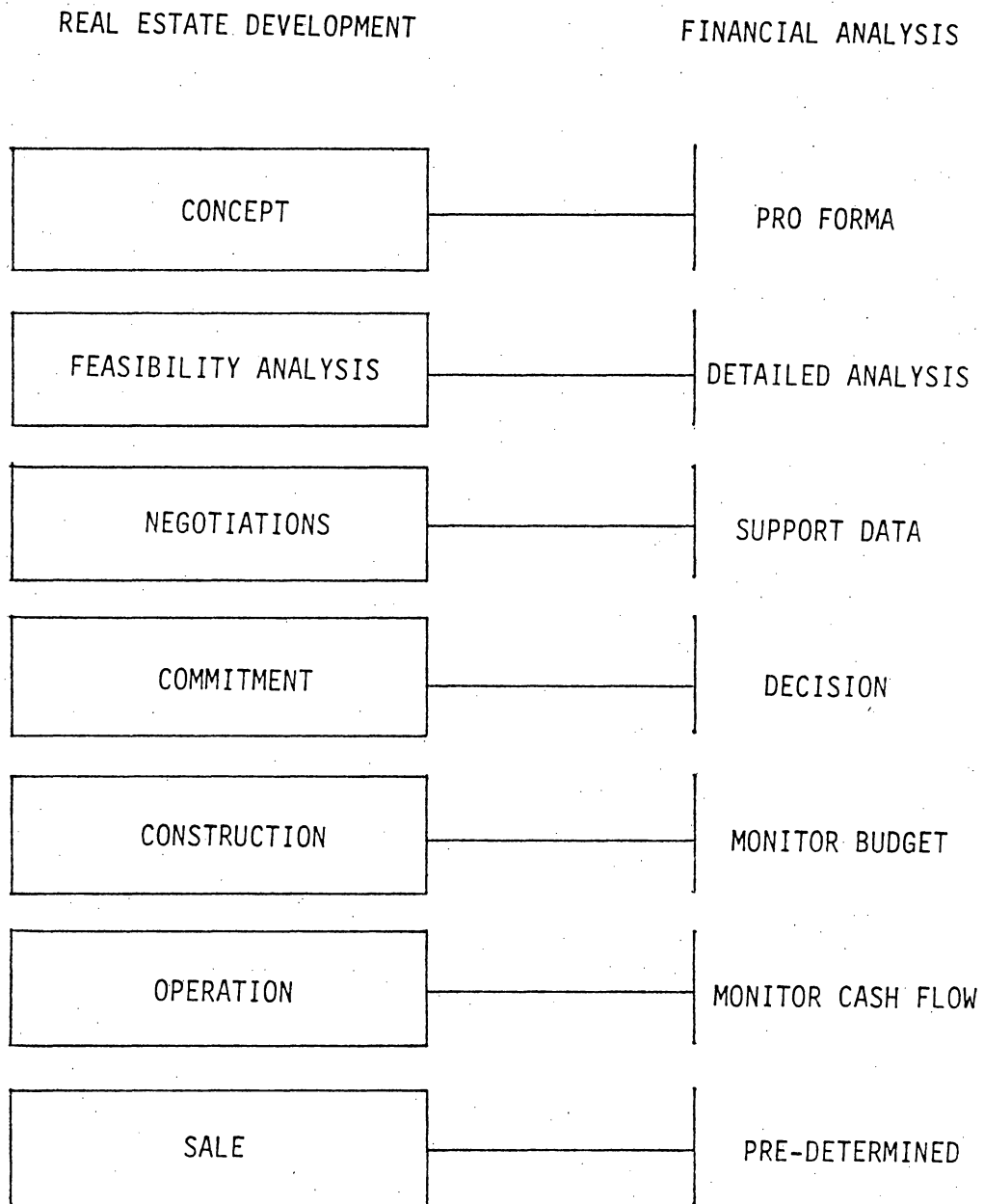


Figure 2.2. Financial Analysis in Real Estate Development.

rate of return criteria that are established to attract suitable lenders and investors.

The developer begins the financial analysis with a pro forma analysis. This rough estimate is based on a static model that projects the first year's potential gross income and operating expenses. The developer will recalculate this estimate each time more information comes to light.

2. Feasibility Analysis Stage. The development concept is then expanded to include several alternatives. A feasibility study is conducted to determine the alternative that best fits the project's specific constraints: legal, physical, financial, market, community compatibility, and architectural.

The pro forma analysis calculated in Stage 1 is replaced by a more detailed analysis that considers the project's entire life cycle. A computer simulation, similar to the Real Estate Analysis Model I described in Chapter 1 of this thesis, may be used to perform a series of iterations estimating the project's cash flow and rate of return. The computer's speed allows analysts to quickly examine the effect of changes in variables, such as mortgage terms, discount rates, income tax rates, and operating expenses.

The analysis will continue to be fine tuned as the development progresses, but this stage of calculations is the most critical because of its influence on the terms negotiated by the developer, lenders, investors, and contractors. In addition, the assumptions made at this

stage will have some bearing on the length of the investor's holding period.

3. Negotiations Stage. The developer uses the feasibility analysis conducted in Stage 2 to negotiate with the general contractor, construction lender, permanent lender, investors, and potential tenants. In addition, investors perform investment analysis to examine the status of their specific situation. Lenders appraise the project's total value and then apply a loan-to-value ratio to determine the amount they are willing to loan.

The developer must come to agreement with all of the participants in the development. The loan contracts are particularly difficult. The developer must first convince a permanent lender of the project's value and enter into an agreement. He then takes that agreement, known as the take out loan, to potential construction lenders for negotiations.

4. Commitment Stage. The agreements negotiated in Stage 3 are signed. Partnerships and joint venture agreements are signed, the construction loan is closed, and the permanent lender pays a fee that obligates him to the permanent loan. In addition, a construction budget is devised that will insure that funds are available as the building is constructed. This budget must be close to the estimate made in the financial feasibility analysis to maintain the integrity of the cash flow and rate of return calculations.

5. Construction Stage. The building is constructed in this stage according to the architect's design. The budget drawn in the previous stage is used for scheduling payments to the contractors and to make

sure that funds are available for the completion of construction.

During the construction stage, "the developer experiences maximum financial exposure."<sup>4</sup> It is critical that the project be brought in on time and on budget. Each month that a project's completion date is delayed, the developer's construction loan carrying charges increase at an astronomical rate, bringing the project closer to possible failure.

6. Operation Stage. In this stage the construction is complete and the building goes into operation. Tenants who pre-leased space move into the building, and additional tenants are sought if necessary. The permanent loan is closed and the construction loan is repaid.

At this point the developer either sells the project to long-term equity investors, or retains and manages the new building. This decision is made by the developer in the earliest stages of the project and depends on his interests and experience.

The cash flow is monitored by the developer or property manager. If the project is progressing as planned, the revenue will cover operating expenses and debt services, and provide the expected return to the investors. When the revenue is insufficient, operating expenses are reduced and rents are increased to make up the deficit.

7. Sale Stage. The timing of the sale of a real estate development depends on the investor's needs and is the final stage of financial analysis. The length of the holding period is used in calculating the reversion value, which becomes an essential part of the rate of return calculations. Frequently the actual sale date is not the

same as that projected. When this occurs, new calculations are conducted using the new sales date.

Glossary

Cash flow: The annual before or after tax benefits generated by a project.

Construction loan: Short-term interim financing used to pay for materials and labor during the period of construction.

Equity investment: A form of investment, based on ownership, that entitles the investor to share in profits proportional to the share of ownership. In contrast, a lender usually receives interest on the amount borrowed and a return of the loan principal.

Joint venture: An association of two or more persons or firms for the purpose carrying out a specific project. Frequently real estate joint ventures involve a developer and a financing party.

Loan to value ratio: The proportion of funds borrowed for mortgage financing to the project's total capital cost.

Principal build-up: An increase in the investor's share of property value resulting from mortgage principal retirement.

Pro forma: An initial estimate of a project's income and expenses based on a static model, typically dealing in constant dollars.

Property appreciation: An increase in the value of a property based on market supply and demand.

Rate of return: The percentage relationship between cash flow and the investor's original contribution.

Risk: The variance between an expected outcome, such as a rate of return, and the eventual outcome.

Takeout loan (permanent loan): A long-term loan used to repay the construction loan.

## CHAPTER 3

### AMERICAN BREWERY CASE STUDY

#### Purpose

This case study will evaluate the financial feasibility of three proposed alternative uses of the American Brewery in Baltimore, Maryland. The proposed alternatives include rehabilitating the Brewery for industrial, office, and vo-tech skill center use. Each alternative will be analyzed within the legal and financial framework of three ownership development strategies: private, public-private joint venture, and public.

The Real Estate Analysis Model I, a computer simulation, will be used to translate the potential of each option into financial feasibility criteria, including cash flow, rate of return, and solvency.

Then, these criteria can be compared to the current market conditions in the area surrounding the Brewery. An alternative that measures favorably in financial feasibility and market demand will indicate a large potential for success.

### American Brewery: Existing Conditions

The American Brewery is located at 1700 North Gay Street, in the center of a residential community in East Baltimore, Maryland. The neighborhood surrounding the Brewery is currently suffering from depressed economic conditions: declining population, high unemployment, and commercial and residential disinvestment. Many of the row houses and lots in the vicinity are vacant.

The brewery complex is composed of 20 buildings situated on a 3.18 acre site bisected by North Gay Street. The site, which is zoned for industrial use, is owned by the City of Baltimore and leased to the East Baltimore Community Corporation (EBCC). Several buildings have been renovated and house an electronics packaging plant, while others have deteriorated to the point of being structurally unsafe. The EBCC maintains offices in one building and the remaining buildings are vacant.

In 1972 the American Brewery was listed on the National Register for Historic Places. The Brewery is described on the nomination form as being "a monument to the development of brewing, one of Baltimore's major industries, and to the Germans who worked there and lived in the area."

### The Brewhouse

The most historically significant building in the complex is the Brewhouse, a five-story brick structure capped by three towers that give the building a much taller appearance. It was built by German

immigrants in 1887 and is an excellent representative of 19th century industrial architecture.

The structure is wall bearing brick masonry with a center spine consisting of cast iron columns and wood girders. Wall thickness varies from 18" at the bottom of the exterior wall. With the exception of the three towers, the roof structure is wood framing and sheathing covered with hot tar and felts. The towers are constructed with wood framing and sheathing covered with 1/4" slate shingles. Existing tower ornamentation is approximately 24 ga. fabricated metal.<sup>5</sup>

The Brewhouse has been vacant since 1972. During that time a small fire and adverse weather have exacted a toll on the building's integrity. In an examination of the building's structural condition conducted by members of the Building Construction Department at Virginia Tech the following recommendations were made.

1. The existing wall structure should be repointed and sealed.
2. The existing wood flooring should be removed due to its advanced deterioration.
3. The existing south tower will have to be extensively reconstructed.
4. The building should be weatherproofed immediately to halt further deterioration.
5. The building should be demolished soon if steps aren't taken toward preservation. This would be in the interest of public safety.<sup>6</sup>

### Development Rationale

The market conditions in the community surrounding the American Brewery are very depressed. The local population is moving away and leaving buildings sitting vacant. The current deteriorating conditions identify this section of Baltimore as being in need of a revitalizing force to reverse this trend and to move in the direction of growth.

The primary objective underlying development of the American Brewery is to provide a positive stimulus to the local community. To achieve this objective other more immediate goals must be met that have a direct bearing on the strategy chosen for development. In general, economic benefits must be maximized for the greatest number, while economic costs are minimized.

1. Client/end user: High quality functional space must be provided at the least possible cost.
2. Neighborhood: The local neighborhood should benefit by the creation of jobs and additional community services. Development should not lead to the displacement of existing residents.
3. Baltimore City: Fulfill the employment needs of city residents and increase the city tax base. The cost of additional infrastructure necessary to promote growth and development should be minimized.
4. Developer/investor: Provide an attractive return on investment with the least possible risk.

Specific obstacles stand in the way of development of the American Brewery, not the least of which is the difficulty in attracting a

developer/investor and tenants into this economically depressed market area. To attract development to the East Baltimore area the following criteria must be examined to insure financial feasibility.

1. The ability to attract adequate capital resources.
2. An investment rate of return commensurate with the project's perceived level of risk.
3. The project's performance in terms of cash solvency (ability to generate reliable cash flow benefits over a long period of time).

In addition, the American Brewery's historical character should be captured for the benefit of future generations. The American Brewery is listed on the National Register for Historic Places which qualifies it for specific tax advantages. These advantages are intended to encourage the rehabilitation of historic buildings, such as the American Brewery, and to revitalize areas with depressed economic conditions, such as East Baltimore.

### Alternative Uses

The Brewhouse has been selected as the focus of this analysis because of its importance as a visual symbol to the surrounding community and its unique historical character. Future investigations will have to examine the feasibility of rehabilitating other existing buildings and the possibility of new construction.

The American Brewery Market Area was characterized in a market study conducted at Virginia Tech as follows:

1. commercial and residential disinvestment,
2. high percentage of absentee landlords,
3. high unemployment, and
4. low income level of area residents.<sup>7</sup>

These characteristics are not favorable for attracting investment or development into an area. Instead, they describe a situation with potentially high risk that will require a commensurately large return to attract an investor.

The current and future market demand for industrial, office, and vo-tech space is summarized in the Current Market Condition Matrix. The sources for these rental rates can be found in Appendix B.

The Brewhouse has been considered for a large number of development concepts including restaurants, retail, commercial, residential, industrial, and public use. From these, industrial, office, and vo-tech skill center are the most reasonable uses based on physical, legal, social, and general economic limitations. Below is an introduction to

the alternative uses considered in this study and the market conditions relating to them.

Industrial: The Brewhouse could be rehabilitated into a single or multi-tenant industrial space. The open interior floor plan lends itself to continued industrial use; however, the multi-story design would make it more suitable for a non-continuous production process.

Current demand, future demand, and economic feasibility were rated as having moderate compatibility in the market study previously cited.

A rental rate of \$2.50 per square foot is indicated for a triple net lease, which requires the tenants to pay all operating expenses (see Appendix B).

Office: The Brewhouse could be rehabilitated for commercial or government office space. This alternative use might require a zoning variance or special use permit, which would require additional time to obtain, thus postponing the building's return to operation.

No current or future demand exists for office space in the vicinity of the American Brewery. Economic feasibility was also determined to be incompatible with existing conditions according to the market study cited above. Due to these poor market conditions, the \$5.95 per square foot rental rate (see Appendix B) used in the financial calculations is probably too high for office space in this area. The \$5.95 rate is based on a gross lease that requires the landlord to pay all operating expenses.

Vo-tech skill center: The Brewhouse could be rehabilitated for use as a vo-tech skill center that would provide occupational training to

high school students and retraining programs for the unemployed. The American Brewery's central location would enable it to provide easy access to "feeder" high schools, and the possibility of establishing work-study programs with local businesses. In addition, during hours when the school is not in operation, the building could be used as a community center.

The current and future demand for a vo-tech skill center is considered to be a very compatible use. This conclusion is further borne out by a written justification, by the Maryland Department of Education, for a skill center to be located in the North Gay Street area. A rental rate of \$13.78 per square foot (see Appendix B) was used in performing the financial analysis. This rate is based on a gross lease.

Table 3.1 summarizes the current market conditions for the alternative uses. Table 3.2 indicates rehabilitation cost versus new construction cost.

TABLE: 3.1

Current Market Conditions Matrix

	Industrial	Office	Vo-Tech
	Current & future demand: moderate	Current & future demand: none	Current & future demand: high
Private	Lease: triple net	Lease: gross	Lease: gross
	Rent: \$2.50	Rent: \$5.95	Rent: \$13.78
	Current & future demand: moderate	Current & future demand: none	Current & future demand: high
Joint Venture	Lease: triple net	Lease: gross	Lease: gross
	Rent: \$2.50	Rent: \$5.95	Rent: \$13.78
	Current & future demand: moderate	Current & future demand: none	Current & future demand: high
Public	Lease: triple net	Lease: gross	Lease: gross
	Rent: \$2.50	Rent: \$5.95	Rent: \$13.78

TABLE: 3.2

Design Factors Matrix

	Industrial	Office	Vo-Tech
Private	Gross building area: 26,992 sq. ft.	Gross building area: 26,992 sq. ft.	Gross building area: 26,992 sq. ft.
	Rentable area: 23,122 sq. ft.	Rentable area: 23,122 sq. ft.	Rentable area: 23,122 sq. ft.
	Rehabilitation cost:	Rehabilitation cost:	Rehabilitation cost:
	Floors one-five \$17.60	Floors one-five \$39.32	Floors one-five \$63.50
	Basement \$11.99	Basement \$18.97	Basement \$25.56
	New construction cost:	New construction cost:	New construction cost:
	Floors one-five \$23.24	Floors one-five \$43.54	Floors one-five \$72.38
	Basement \$15.23	Basement \$19.82	Basement - not available
Joint Venture	Gross building area: 26,992 sq. ft.	Gross building area: 26,992 sq. ft.	Gross building area: 26,992 sq. ft.
	Rentable area: 23,122 sq. ft.	Rentable area: 23,122 sq. ft.	Rentable area: 23,122 sq. ft.
	Rehabilitation cost:	Rehabilitation cost:	Rehabilitation cost:
	Floors one-five \$17.60	Floors one-five \$39.32	Floors one-five \$63.50
	Basement \$11.99	Basement \$18.97	Basement \$25.56
	New construction cost:	New construction cost:	New construction cost:
	Floors one-five \$23.24	Floors one-five \$43.54	Floors one-five \$72.38
	Basement \$15.23	Basement \$19.82	Basement - not available
Public	Gross building area: 26,992 sq. ft.	Gross building area: 26,992 sq. ft.	Gross building area: 26,992 sq. ft.
	Rentable area: 23,122 sq. ft.	Rentable area: 23,122 sq. ft.	Rentable area: 23,122 sq. ft.
	Rehabilitation cost:	Rehabilitation cost:	Rehabilitation cost:
	Floors one-five \$17.60	Floors one-five \$39.32	Floors one-five \$63.50
	Basement \$11.99	Basement \$18.97	Basement \$25.56
	New construction cost:	New construction cost:	New construction cost:
	Floors one-five \$23.24	Floors one-five \$43.54	Floors one-five \$72.38
	Basement \$15.23	Basement \$19.82	Basement - not available

### Ownership/Development Strategies

The basis for comparison of the alternative uses includes cash flow, rate of return, and solvency. These factors are largely influenced by the ownership/development strategy that is employed. Private, public-private joint venture, and public ownership/development strategies each have specific investment opportunities that benefit for the Brewhouse owner and developer (see Table 3.3).

Private: A private developer purchases the American Brewery from the City of Baltimore at a nominal cost, rehabilitates the space and leases it to a tenant. The developer retains possession of the Brewhouse as an investment for approximately ten years, and then sells it with the intention of making a profit.

Public-private joint venture: The City of Baltimore and a private developer form a joint venture for the purpose of rehabilitating the Brewhouse. The developer provides skill and experience, and Baltimore City donates the Brewhouse and supplies inexpensive financing through a tax-exempt industrial development revenue bond.

In return, the developer is able to take advantage of historic rehabilitation tax benefits and financing at interest rates that otherwise might not be available. Baltimore City would maintain control over the project that would normally be relinquished to a private developer if the private strategy was used. In addition, the city could insure that the Brewhouse would be is available for the use of local residents.

TABLE: 3.3

Ownership/Development Strategies Matrix

	Industrial	Office	Vo-Tech
	Tax benefits: 25% tax credit, 15 year straight line depreciation	Tax benefits: 25% tax credit, 15 year straight line depreciation	Tax benefits: 25% tax credit, 15 year straight line depreciation
Private	Owner: developer Lease: industrial tenants	Owner: developer Lease: office tenants	Owner: developer Lease: Maryland Dept. of Education
	Tax benefits: 25% tax credit, 15 year straight line depreciation	Tax benefits: 25% tax credit, 15 year straight line depreciation	Tax benefits: 25% tax credit, 15 year straight line depreciation
Joint Venture	Owner: city Lease: developer Sublease: industrial tenants	Owner: city Lease: developer Sublease: office tenants	Owner: city Lease: developer Sublease: Maryland Dept. of Education
	Tax benefits: none	Tax benefits: none	Tax benefits: none
Public	Owner: city Lease: industrial tenants	Owner: city Lease: office tenants	Owner: city Lease: Maryland Dept. of Education

This strategy would require the city to lease the Brewhouse to the developer. During the term of the lease the developer would receive cash and tax benefits. At the end of the lease term, the leasehold improvements and rights would revert to the city.

Public: The final strategy involves the City of Baltimore developing the brewery complex without the assistance of private capital or development expertise. The city could use tax-exempt bond financing to reduce costs. However, without the involvement of a private developer the tax advantages listed below will be foregone.

Tax: The Economic Recovery Tax Act of 1981 (ERTA) provides specific tax advantages for buildings that are listed on the National Register of Historic Places. To qualify, the developer must also meet the following stipulations: the rehabilitation expenditures must exceed the greater of either the taxpayer's adjusted basis in the property or \$5,000 within a 24 month period, the building in use prior to the rehabilitation, and 75% of the existing walls are retained.

Under ERTA, the American Brewery qualifies for the following benefits:

1. 25% investment tax credit on the rehabilitation costs for certified historic structures.
2. A 15 year useful life for straight line depreciation purposes.

To use these benefits the developer or owner must be a taxpaying entity. Moreover, the taxpayer will need another source of income from which to offset the tax credit and depreciation deductions.

Financing: The ability of a particular alternative to attract capital for financing depends on current interest rates, the amount of funds required, and the security demanded by the lender. These factors must be translated into the permanent mortgage loan or a municipal bond issue (see Table 3.4).

Long-term financing can be obtained from insurance companies, banks, private investors, or through the issuance of tax-exempt municipal bonds. For the purpose of this analysis, conventional financing would be used for the private ownership/development strategy. Conventional financing involves competing with other potential borrowers in an effort to obtain funds from a private institution, such as banks or insurance companies. The current interest rate for conventional financing is approximately 13%. The public and joint venture ownership/development strategies would use industrial development revenue bonds issued by the City of Baltimore at a current interest rate of 9%.

Investment: The developer is ultimately concerned with the project's feasibility and potential as an investment. The following measures of investment performance were calculated, using the Real Estate Analysis Model I (REAM I) computer simulation, to rate the financial feasibility of the various combinations of the alternative uses and ownership/development strategies.

1. After tax cash flow: The amount of cash remaining after deducting all operating expenses, debt service, and tax liability, plus the addition of any tax savings. For the public ownership/development strategy the objective is to breakeven, that is, to be able to pay all

TABLE: 3.4

Financial Factors Matrix

	Industrial	Office	Vo-Tech
	Financing: conventional	Financing: conventional	Financing: conventional
Private	NOI: \$52,024.50 Initial project cost: \$685,485.68 Mortgage loan interest rate: .1327	NOI: \$61,388.91 Initial project cost: \$1,454,272.39 Mortgage loan interest rate: .135	NOI: \$245,719.98 Initial project cost: \$2,254,311.70 Mortgage loan interest rate: .135
	Financing: industrial development bonds	Financing: industrial development bonds	Financing: industrial development bonds
Joint Venture	NOI: \$52,024.50 Initial project cost: \$685,485.68 Mortgage loan interest rate: .0893	NOI: \$61,388.91 Initial project cost: \$1,454,272.39 Mortgage loan interest rate: .0893	NOI: \$245,719.98 Initial project cost: \$2,254,311.70 Mortgage loan interest rate: .0893
	Financing: industrial development bonds	Financing: industrial development bonds	Financing: industrial development bonds
Public	NOI: \$34,887.36 Initial project cost: \$685,485.68 Mortgage loan interest rate: .0893	NOI: \$25,032.10 Initial project cost: \$1,454,272.39 Mortgage loan interest rate: .0893	NOI: \$189,362.19 Initial project cost: \$2,254,311.70 Mortgage loan interest rate: .0893

expenses and debt service without the need for any subsidy. In addition, because the public strategy involves a non-taxpaying entity, there is no tax liability or tax savings benefit.

2. After tax cash rate of return: The ratio of after tax cash flow to the investor's original contribution. The public ownership/development strategy is financed without an investor's contribution, which makes the after tax cash rate of return meaningless in this case.

3. After tax internal rate of return: The actual rate of return which includes after tax cash flow and cash benefits from resale of the project. This rate of return is not calculated for the public ownership/development strategy since there is no investor contribution or ultimate resale.

4. After tax payback: A measure of the amount of investor's contribution that has not been returned as cash flow benefits to the investor. The payback period is the length of time required for the recovery of the investor's original contribution. This rate of return is not calculated for the public ownership/development strategy since there is no investor contribution.

5. After tax net worth: A measure of project solvency at the time of resale. The estimated resale price in any particular year minus resale costs, outstanding loan balances, and taxes due at the time of sale equal the project's after tax net worth. This amount should be in excess of the investor's original contribution.

These investment performance measures were calculated for all of the possible combinations of the alternative uses and ownership/develop-

ment strategies, using the REAM I computer simulation. The results for years one, five, and ten are compared in the following tables and matrix. It should be noted that although there can be a high degree of certainty about the data and conclusions for the first year, over longer analysis periods small discrepancies are magnified and conclusions become increasingly less reliable. Calculations based on data projected for the later years are merely conjecture and very little emphasis should be placed on them.

Table 3.5, 3.6, and 3.7 compare the ownership/development strategies for the industrial, office, and vo-tech skill center alternatives. In each case, the public-private joint venture strategy was found to yield the best results, which are summarized in Table 3.8.

Table 3.9 compares the cash flow, rates of return, and solvency, and then establishes an overall ranking for the nine options.

TABLE 3.5

Industrial Ownership/Development Strategy Comparisons

	<u>Private</u>	<u>Joint Venture</u>	<u>Public</u>
<u>Cash Flow</u>			
After Tax Cash Flow: in dollars			
Y <sub>1</sub>	178,487	185,315	(38,949)
Y <sub>5</sub>	10,813	17,509	(31,430)
Y <sub>10</sub>	15,201	22,438	(19,715)
<u>Rate of Return</u>			
After Tax Cash Rate of Return			
Y <sub>1</sub>	.994	1.032	NA
Y <sub>5</sub>	.060	.097	NA
Y <sub>10</sub>	.085	.125	NA
After Tax Internal Rate of Return			
Y <sub>1</sub>	.668	.888	NA
Y <sub>5</sub>	.236	.325	NA
Y <sub>10</sub>	.213	.302	NA
<u>Solvency</u>			
After Tax Payback			
Y <sub>1</sub>	.994	1.032	NA
Y <sub>5</sub>	1.204	1.391	NA
Y <sub>10</sub>	1.580	1.960	NA
After Tax Net Worth: in dollars			
Y <sub>1</sub>	121,068	153,812	(21,223)
Y <sub>5</sub>	49,411	60,427	(92,898)
Y <sub>10</sub>	(8,417)	(26,592)	(142,230)

TABLE 3.6

Office Ownership/Development Strategy Comparisons

	<u>Private</u>	<u>Joint Venture</u>	<u>Public</u>
<u>Cash Flow</u>			
After Tax Cash Flow: in dollars			
Y <sub>1</sub>	356,674	371,425	(131,613)
Y <sub>5</sub>	(4,129)	10,318	(126,219)
Y <sub>10</sub>	(2,685)	12,878	(117,812)
<u>Rate of Return</u>			
After Tax Cash Rate of Return			
Y <sub>1</sub>	.840	.875	NA
Y <sub>5</sub>	(.010)	.024	NA
Y <sub>10</sub>	(.006)	.030	NA
After Tax Internal Rate of Return			
Y <sub>1</sub>	.471	.744	NA
Y <sub>5</sub>	NA	.156	NA
Y <sub>10</sub>	NA	NA	NA
<u>Solvency</u>			
After Tax Payback			
Y <sub>1</sub>	.840	.875	NA
Y <sub>5</sub>	.792	.963	NA
Y <sub>10</sub>	.757	1.104	NA
After Tax Net Worth: in dollars			
Y <sub>1</sub>	267,913	369,114	(45,025)
Y <sub>5</sub>	(15,307)	166,830	(197,086)
Y <sub>10</sub>	(304,827)	(25,549)	(301,744)

TABLE 3.7

Vo-Tech Skill Center Ownership/Development Strategy Comparisons

	<u>Private</u>	<u>Joint Venture</u>	<u>Public</u>
<u>Cash Flow</u>			
After Tax Cash Flow: in dollars			
Y <sub>1</sub>	628,172	651,036	(53,458)
Y <sub>5</sub>	85,103	107,497	(12,650)
Y <sub>10</sub>	112,622	136,747	50,942
<u>Rate of Return</u>			
After Tax Cash Rate of Return			
Y <sub>1</sub>	.954	.989	NA
Y <sub>5</sub>	.129	.163	NA
Y <sub>10</sub>	.171	.208	NA
<u>After Tax Internal Rate of Return</u>			
Y <sub>1</sub>	.731	.858	NA
Y <sub>5</sub>	.371	.380	NA
Y <sub>10</sub>	.342	.378	NA
<u>Solvency</u>			
After Tax Payback			
Y <sub>1</sub>	.954	.989	NA
Y <sub>5</sub>	1.424	1.595	NA
Y <sub>10</sub>	2.195	2.542	NA
<u>After Tax Net Worth: in dollars</u>			
Y <sub>1</sub>	511,040	572,175	(69,794)
Y <sub>5</sub>	454,974	258,608	(305,508)
Y <sub>10</sub>	484,881	(39,604)	(467,743)

TABLE 3.8

Alternative Use Comparisons: Joint Venture

	<u>Industrial</u>	<u>Office</u>	<u>Vo-Tech</u>
<u>Cash Flow</u>			
After Tax Cash Flow: in dollars			
Y <sub>1</sub>	185,315	371,425	651,036
Y <sub>5</sub>	17,509	10,318	107,497
Y <sub>10</sub>	22,438	12,878	136,747
<u>Rate of Return</u>			
After Tax Cash Rate of Return			
Y <sub>1</sub>	1.032	.875	.989
Y <sub>5</sub>	.097	.024	.163
Y <sub>10</sub>	.125	.030	.208
After Tax Internal Rate of Return			
Y <sub>1</sub>	.888	.744	.858
Y <sub>5</sub>	.325	.156	.380
Y <sub>10</sub>	.302	NA	.378
<u>Solvency</u>			
After Tax Payback			
Y <sub>1</sub>	1.032	.875	.989
Y <sub>5</sub>	1.391	.963	1.595
Y <sub>10</sub>	1.960	1.104	2.542
After Tax Net Worth: in dollars			
Y <sub>1</sub>	153,812	369,114	572,175
Y <sub>5</sub>	60,427	166,830	258,608
Y <sub>10</sub>	(26,592)	(25,549)	(39,604)

TABLE 3.9

Investment Performance Matrix  
(After Tax)

	Industrial	Office	Vo-Tech
Private	Cash flow: average Rates of return Cash rate of return: average Internal rate of return: average Solvency Payback: average Net worth: average OVERALL RATING: 4	Cash flow: below average Rates of return Cash rate of return: below average Internal rate of return: below average Solvency Payback: below average Net worth: below average OVERALL RATING: 6	Cash flow: above average Rates of return Cash rate of return: average Internal rate of return: above average Solvency Payback: average Net worth: above average OVERALL RATING: 2
Joint Venture	Cash flow: average Rates of return Cash rate of return: average Internal rate of return: average Solvency Payback: average Net worth: average OVERALL RATING: 3	Cash flow: average Rates of return Cash rate of return: below average Internal rate of return: below average Solvency Payback: below average Net worth: average OVERALL RATING: 5	Cash flow: above average Rates of return Cash rate of return: above average Internal rate of return: above average Solvency Payback: above average Net worth: average OVERALL RATING: 1
Public	Cash flow: below average Rates of return Cash rate of return: NA Internal rate of return: NA Solvency Payback: NA Net worth: below average OVERALL RATING: 7	Cash flow: below average Rates of return Cash rate of return: NA Internal rate of return: NA Solvency Payback: NA Net worth: below average OVERALL RATING: 9	Cash flow: below average Rates of return Cash rate of return: NA Internal rate of return: NA Solvency Payback: NA Net worth: below average OVERALL RATING: 8

### Sensitivity Analysis

Sensitivity analysis is the process of evaluating the effect of a change in an assumption on a project's performance. Each change is measured separately, while all other assumptions are held constant. This process is typically aided by the use of a computer cash flow simulation model similar to REAM I.

A sensitivity analysis was performed on the vo-tech skill center scenario, employing the public-private joint venture strategy. The analysis measured the impact of a 20% increase and decrease in net operating income (rent minus vacancy and operating expenses), the initial project cost, and the industrial development revenue bond interest rate used for mortgage financing.

The analysis indicates that even with a 20% increase or decrease in the assumptions, the vo-tech joint venture scenario still continues to yield an attractive rate of return. Therefore, if rents are reduced, the project's cost increases, or interest rates rise, the vo-tech skill center remains a financially feasible alternative. Table 3.10 illustrates these results.

TABLE 3.10

Sensitivity Analysis

	<u>% Change</u>		
	<u>(.20)</u>	<u>0</u>	<u>+.20</u>
NOI	\$196,575.98	\$245,719.98	\$294,863.98
Resulting IRR	.296	.378	.450
Resulting payback	2.073	2.542	3.012
Initial project cost	\$1,803,449.36	\$2,254,311.70	\$2,705,174.04
Resulting IRR	.588	.378	.256
Resulting payback	3.343	2.542	2.008
Mortgage loan interest rate	.0714	.0893	.1072
Resulting IRR	.400	.378	.351
Resulting payback	2.659	2.542	2.412

## Conclusions and Recommendations

The complexity of this analysis has required a great deal of reliance on various sources of project information, particularly market data. The reader should realize that project conditions are constantly changing, and as time passes and circumstances change the conclusions of this report may be effected.

This analysis began with the examination of nine alternative use and ownership/development strategy combinations. The conclusions listed below were derived by considering market, legal, and financial factors that shape a project's financial feasibility.

1. The public-private joint venture is the best ownership development strategy for each of the alternative uses based on project solvency and potential return to the investor.

2. Based on financial analysis of the Brewhouse, the vo-tech skill center is the most feasible alternative use. A market study of the American Brewery Market Area concurs with this finding.

3. Based on the assumptions made for this analysis (see Appendices B and C), rehabilitation of the Brewhouse for use as a vo-tech skill center should provide an attractive return to the investor and functional space to the user and surrounding community.

## FOOTNOTES

<sup>1</sup>James C. Canestaro, Real Estate Financial Feasibility Analysis Handbook, (Blacksburg: Virginia Polytechnic Institute and State University, 1978) p. 3.4.

<sup>2</sup>Alvin L. Arnold and others, Modern Real Estate, (Boston, Massachusetts: Warren, Gorham and Lamont, Inc., 1980) p. 423.

<sup>3</sup>James A. Graaskamp, A Guide to Feasibility Analysis, (Chicago, Illinois: Society of Real Estate Appraisers, 1970) p. 13.

<sup>4</sup>Arnold, p. 442.

<sup>5</sup>Joe Showers, Virginia Tech, Department of Architecture, "Report on the American Brewery Building, Baltimore, Maryland," April 1982.

<sup>6</sup>Showers.

<sup>7</sup>Mark D. Mittereder, A Market and Feasibility Analysis for the American Brewery Rehabilitation Project in Baltimore, Maryland, (Blacksburg: Virginia Polytechnic Institute and State University, 1982) p. 95.

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## APPENDICES

APPENDIX A

REAM I Instruction Manual

## Instruction Manual

Real Estate Analysis Model 1

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Ream 1

College of Architecture  
Virginia Polytechnic Institute and State University

## Preface

The REAM 1 model will calculate cash flows, reversions, mortgage amortization schedule, depreciation schedule, rates and ratio analysis for real estate investment proposals. Users are prompted for all necessary data inputs and types of output desired. The following manual will explain in detail how to operate the model and what data the user should provide for the model to analyze a real estate project's investment feasibility.

The REAM 1 computer simulation model is intended exclusively as an instructional tool. Tax calculations may not account for all current IRS code regulations.

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## Chapter 1

## LOGGING ON

1.1 LOGGING ON THE VC415

To log on to the VC415, the user must first turn on the terminal. This is accomplished by turning the knob at the left hand side of the screen. The user must next make sure that the green light on the modem (little box to the left of the terminal) is on. (If the red light is on, then hit the white button on the modem and this should activate the green light. If the red or yellow light stays on move to another vacant terminal.)

The user then types in 'RS' and the computer responds with 'Request'. The user types in 'VM1E' and the computer responds with 'Enter Terminal Type'. The user then types in 'VC415'. Next, the screen will display a banner message telling the user to log on the VM system. This message consists of letters that fill the screen and the user must strike the 'clear' key before proceeding to the next log on step.

Next, the user types in 'L' and the user identification number which is provided by the instructor. The computer will then respond with 'PASSWORD', and the user types in the password which is also provided by the instructor. The computer will respond by printing two system messages and the user then strikes the return key. Two more system messages will appear and finally the user is ready to access the REAM 1 model.

1.2 LOGGING ON THE MEMOREX

To log on to the Memorex the user must first turn the terminal on. This is accomplished by turning the button on the left hand side of the screen clockwise. After the terminal has warmed up, one of three messages will appear on the screen. The goal here is to get the terminal to have 'VM1' in large letters on the screen.

If there is a large 'VM2' on the screen the user must strike the clear display key and type in 'dial pvm'. This will cause another message which on the fourth line will appear vml and vm2 and a few other machines.

Once the user has progressed to the display that has vml and vm2 and a few other machines listed, he must move the cursor (by

using the arrow keys) until it is under the vml. Next, the user strikes the return key and a large 'vml' will appear on the screen. The user then strikes the return key.

Next, the user types in 'L' and the user identification which is supplied by the instructor. The computer will then respond with 'PASSWORD', and the user types in the password which is also supplied by the instructor. The computer will then respond by printing two system messages and the user then strikes the return key. Two more system messages will appear and finally the user is ready to access the REAM 1 model.

### 1.3 LOGGING ON THE HP2641

To log on to the HP2641 the user must first turn the terminal on. This is accomplished by pushing the rocker switch on the back left hand bottom of the terminal. Next, the user must be sure that settings on the top left side of the keyboard are as follows:

- 1) BAUD RATE - 4800
- 2) DUPLEX - FULL
- 3) PARITY - EVEN

The user is now ready to log on to the system. The user now types in 'RS' and the computer responds with 'REQUEST'. The user then types in 'vmle' and the computer will ask the user what type of terminal he is using. The user will type in 'HP2641' and the computer will respond by printing a large VM1 on the screen.

Next, the user must strike the clear display key and type in 'L' and the user identification number that is provided by the instructor. The computer will respond by printing 'PASSWORD', and the user types in the password which is also provided by the instructor. The computer will respond by printing two system messages and the user then strikes the return key. Two more system messages will appear and finally the user is ready to access the REAM 1 model.

### 1.4 LOGGING ON THE TEKTRONICS

To log on to the Tektronics terminal (not recommended for use for this model unless under dire circumstances), the user must first turn on the terminal. This is accomplished by hitting the rocker switch located on the left under the terminal. The user must next make sure that the green light on the modem (little box beside the terminal) is on. (If it is not on, then hit the white button on the modem and this should activate the green light. If the green light does not come on, move to another vacant terminal.)

The user then types in 'RS' and the computer responds with 'Request'. The user types in 'VM1' and the computer responds with a banner message welcoming the user to VM1 which is followed on the next line by a period ( . ).

Next, the user types in 'L' and the user identification number that is supplied by the instructor. The computer will then respond with 'PASSWORD' and the user type in the password which is also supplied by the instructor. The computer will respond by printing two system messages, followed by a line with a single period. The user then strikes the return key. Two more system messages will appear and finally the user is ready to access the REAM 1 model.

#### 1.5 LOGGING ON THE DECWRITER II

The first step in logging onto the DECWRITER II is to check the settings for the terminal. The correct settings are:

- 1) Rocker ON/OFF (left hand side) is ON.
- 2) The HDX key is down.
- 3) The 300 key is down.
- 4) Modem switch on (green light)

The user is now ready to log on to the system. The user then types in 'RS' and the computer responds with 'Request'. The user types in 'VM1' and the computer responds with a banner message welcoming the user to VM1.

Next, the user types in 'L' and the user identification number, which is provided by the instructor. The computer will respond with 'PASSWORD' and the user types in the password which is also provided by the instructor. The computer will respond by printing two system messages followed by a line with a single period. The user then strikes the return key. Two more system messages and finally the user is ready to access the REAM 1 model.

#### 1.6 LOGGING ON THE REMOTE TERMINAL

First, the user must obtain the College of Architecture remote terminal from the instructor. The user will be personally responsible both repair and replacement of this terminal, when in their possession.

The user should make sure the switch settings on the terminal are correct. These settings should be:

- 1) Lift top panel and locate the rocker switches, they should be set (left to right): ASCII, ON, EVEN
- 2) Speed set at 30
- 3) Duplex set at half

## 4) Power switched on

Next, access the University Computing Center dial-up line by calling 961-7311. The line will ring twice followed by a high pitched sound. Plug the telephone into the modem on the back of the terminal. Place the mouthpiece into the left side of the modem as you look at it from the back. If the line rings more than twice you will not be able to access the computer with your call ---- try again later.

The user then types in 'RS' and the computer responds with 'Request'. The user types in VM1 and the computer responds with a banner message welcoming the user to VM1.

Next, the user types in 'L' and the user identification number, which is supplied by the instructor. The computer will then respond with 'PASSWORD' and the user types in the password which is also supplied by the instructor. The computer will print out two system messages followed by a line with a single period. The user then strikes the return key. Two more system messages will be printed out and finally the user is ready to access the REAM 1 model.

## Chapter 2

## GENERAL INFORMATION

This section illustrates some common user 'errors', describes specific sequential logic that the user must follow, and presents some terminal responses that the user might find helpful.

2.1 ERRORS

1) If the word 'CP' ever appears, type in 'B' and hit return key twice.

2) If you enter a wrong character, backspace (left arrow if you are logged on VM1E) until you are over the mistake and then type in the correct character.

3) If you have hit the return key and then discover that you have made a mistake, continue entering all of the data and then enter the Change mode to make the necessary correction.

2.2 LOGIC

1) Please enter revised or corrected data, in the Change mode, in sequential line order for each iteration.

2.3 TERMINAL RESPONSES

1) If you have logged on VM1E and the word 'MORE...' ever appears on the lower right hand side of the screen, then strike the 'clear' key.

2) If you have is logged on the Tektronics, you should strike the page refresh key when the output data is about to run off the bottom of the screen. Also, use the page refresh key after any mode selection so that the new data will not be writing over that which is already on the screen.

## Chapter 3

## ENTERING THE DATA

After logging on VM1 or VM1E you must type in 'REAM1' (upper or lower case) and hit the return key. The computer should then respond with a banner message that states you are in the REAM 1 model. Once in the model, the user is prompted for the necessary data inputs.

REAM 1 will prompt the user for a request to print a hard copy of the session. If the user chooses to have a paper printout, it will be delivered to the work room in 201 Cowgill the following day.

Note the following input rules:

- 1) Input dollar amounts in whole dollars.
- 2) Do not enter commas.  
EX: 1,200,000 -> wrong : 1200000 -> right
- 3) Percentages should be entered as their decimal equivalent.  
EX: 12% = .12
- 4) Both upper and lower case letters can be used.

### 3.1 PROJECT NAME

The project's name is a character string of up to 10 letters. This name can be comprised of any character on the keyboard except for the blank. It is suggested that each time you change data input, a new name also be entered into the simulation model.

### 3.2 PROJECTION PERIOD

The projection period is the length of time, in full year increments, that the user chooses to analyze a project's performance. This period can range from 2 to 20 years. Should the user try to enter an invalid number, the model will continue to prompt the user until it receives a number in the acceptable holding period.

### 3.3 NET OPERATING INCOME

The Net Operating Income (N.O.I.) data can be entered in three different ways. First, the user can enter the N.O.I. for each year (variable option). Second, the user can input a base year N.O.I. which will be used for all years of the projection period (constant option). Third, the user can input a base year N.O.I. and a compound growth rate for the projection period (compound option).

### 3.4 INITIAL PROJECT COST

The initial project cost is the total capital investment for the purchase or construction of the project. This number should be less than \$999999999. The cost should be rounded to the nearest dollar. This model assumes that this capital investment is made in the beginning of the first year. There is no provision for the addition of capital investments later in the holding period.

### 3.5 PRINCIPAL OR LOAN/VALUE RATIO

The structuring of the mortgage and equity contributions to cover the initial project cost is determined by either inputting the dollar amount of the amortized mortgage loan (principle) or the ratio of mortgage loan to initial project cost (loan/value ratio). The model will accept a mortgage loan in excess of the initial project cost and make the excess loan proceeds in year 0 of the project.

### 3.6 MORTGAGE INTEREST RATE

The mortgage interest rate is the nominal annual rate for the loan, and is compounded on a monthly basis. The rate should be entered in decimal form (i.e. less than 1), if not the model will automatically divide the number entered by 100.

### 3.7 MORTGAGE TERM

The mortgage term is the length of time (in years) over which the loan principal is fully amortized. This number is expressed in full year increments.

### 3.8 MORTGAGE LOAN PAYMENTS PER YEAR

The number of mortgage loan payments per year must be entered as a multiple of 12 (ie. 12 = monthly, 4 = quarterly, 2 = semiannual, and 1 = annual payments) This number is used to properly calculate the annual mortgage constant and annual debt service.

### 3.9 DEPRECIABLE BASIS OR BASIS/VALUE RATIO

The amount of income tax depreciable assets for the project are determined by either inputting the dollar amount of the depreciable asset (basis) or the ratio of depreciable asset cost to initial project cost (basis/value ratio). The model will not accept a basis in excess of the initial project cost. The depreciable basis should be entered as a whole dollar amount while the basis/value ratio should be entered as a decimal.

### 3.10 USEFUL LIFE OF THE DEPRECIABLE ASSET

The useful life is the number of years which depreciation will be claimed on the depreciable basis. This number is expressed in full year increments.

### 3.11 DEPRECIATION METHOD

There are five depreciation methods available for your selection. A numbered code must be entered for the desired depreciation method, which includes:

The following is a list of the depreciation codes:

- 1 = Straight Line
- 2 = 125% Depreciable Basis
- 3 = 150% Depreciable Basis
- 4 = 200% Depreciable Basis
- 5 = Sum of Years Digits

### 3.12 ORDINARY INCOME TAX RATES

There are two categories of income tax rates, individual and corporate. To call up a listing of these tax rates, the user must enter an 'I' (Individual) or a 'C' (Corporate) for the categories that will apply to the analysis. The user has the option to bypass this listing of the tax rates, immediately entering the appropriate ordinary income tax rate in decimal form.

### 3.13 TAX CREDITS

An investment tax credit may be claimed in the first year of the projection period. With the exception of investment tax credits for historic tax restoration, a portion of the tax credit must be deducted from the project's depreciable basis. Refer to the specific IRS tax code for the year of occupancy, for the appropriate basis adjustment.

### 3.14 CAPITAL GAINS TAX RATES

There are two categories of capital gains tax categories. They are individual and corporate and are accessed in the same manner as the income tax rates. The user must supply the tax rate in decimal form when prompted.

### 3.15 RESALE PRICE

The resale price estimate can be calculated in one of three ways: first, as a compound growth rate for the total project cost over the projection period (compound). Second, as a product of the N.O.I. in the year of sale, multiplied by a designated overall corporate rate (overall rate). Third, as a fixed resale price which the user estimates for the year of sale (fixed).

### 3.16 RESALE COMMISSION

The resale commission is the percentage of the resale price that the real estate agent will claim as the fee for brokering the project.

### 3.17 DESIRED EQUITY DISCOUNT RATE

The investor's desired yield on the equity contribution from the cash flow and reversion, is labeled in the model as the equity discount rate. It is used to calculate the present value of the annuity and reversion benefits over the holding period. As with all other percentage inputs, this number should be entered in decimal form. If no equity contribution has been made by the investor, the model will omit the calculation of equity return and payback rates.

## Chapter 4

## THE OUTPUT

The REAM 1 output is segmented into 15 separate output categories (modes). Each output mode displays a distinct component of the real estate project's simulated performance.

4.1 AFTER TAX CASH FLOW MODE (A)

Mode 'A' displays the after tax cash flow calculations. This schedule consists of five columns: (1) the before tax cash flow, (2) income tax liability, (3) tax savings on other income, (4) investment tax credits and (5) the after tax cash flow for each year of the projection period.

## EXAMPLE:

AFTER TAX CASH FLOW: TRIAL  
\*\*\*\*\*

YR	BTCF	-	TAX LIBTY	+	TAX SAV OTH INC	+	TAX CREDIT	=	ATCF
1	144455		0		15081		0		159536
2	167454		1396		0		0		166058
3	190454		17895		0		0		172558
4	213453		34437		0		0		179016
5	236453		51045		0		0		185407
6	254452		65344		0		0		189108
7	274451		80720		0		0		193731
8	294451		96241		0		0		198210
9	328450		118658		0		0		209792
10	351450		136003		0		0		215446

4.2 AFTER TAX REVERSION MODE (AR)

Mode 'AR' displays the after tax reversion calculations for the year of sale. It also includes a listing of key variables used in the calculation of the taxes due at the time of sale.

EXAMPLE:

```

                AFTER TAX REVERSION: TRIAL
                *****
REMAINING DEPREC. BASIS      $ 3829984
CAPITAL GAINS:              $ 3445559
TAX OF CAPITAL GAINS:      $ 1033668

EXCESS ALLOW. DEPRECIATION: $ 379713
TAX ON EXCESS ALLOW. DEPREC: $ 182262

  RESALE PRICE:             $ 9636690
- RESALE COMMISSION:       $ 578201
= NET RESALE PRICE:       $ 9058489
- OUTSTANDING MTG. BALANCE: $ 5063300
= BEFORE TAX REVERSION:   $ 3995189
- TAXES DUE AT TIME OF SALE: $ 1215930
-----
= AFTER TAX REVERSION:    $ 2779259

```

4.3 BEFORE TAX CASH FLOW MODE (B)

Mode 'B' displays the before tax cash flow calculations. This schedule includes six columns of output data: (1) net operating income, (2) annual debt service, (3) before tax cash flow, (4) principal amortization, (5) depreciation deduction, and (6) taxable income; for each year of the projection period.

## EXAMPLE:

BEFORE TAX CASH FLOW: TRIAL  
\*\*\*\*\*

YR.	NOI	ANN DEBT - SERVICE	= BTCF +	PRINC AMORTZ -	DEPREC CLAIMED	TAXABLE = INCOME
1	710813	566358	144455	34611	210485	-31419
2	733812	566358	167454	38046	202592	2908
3	756812	566358	190454	41822	194994	37282
4	779811	566358	213453	45973	187682	71744
5	802811	566358	236453	50536	180644	106344
6	820810	566358	254452	55552	173870	136133
7	840809	566358	274451	61065	167350	168166
8	860809	566358	294451	67125	161074	200502
9	894808	566358	328450	73788	155034	247203
10	917808	566358	351450	81111	149220	283340
				-----	-----	
				549630	1782945	

4.4 CHANGE MODE (C)

Mode 'C' is used to correct or revise the data inputs. This mode allows the user to modify one or all of the project variables and then run a new project analysis without going through the logon process. This mode will give a list of the data and their associated line numbers on request. The user must first enter the line number to be changed. The model will display the current value of the variable and request the new input. Remember to make changes in sequential line order. When the last change is made, the user enters a 0 to exit the Change Mode. The model will then recalculate the project's investment performance.

## EXAMPLE:

DO YOU WISH THE CHANGE LISTING (Y/N)

y

LINE 0 = EXIT CHANGE MODE  
 LINE 1 = PROJECT NAME  
 LINE 2 = PROJECTION PERIOD  
 LINE 3 = NET OPERATING INCOME  
 LINE 4 = INITIAL PROJECT COST  
 LINE 5 = PRINCIPAL OR LOAN/VALUE RATIO  
 LINE 6 = MORTGAGE INTEREST RATE  
 LINE 7 = MORTGAGE TERM  
 LINE 8 = NUMBER OF MORTGAGE LOAN PAYMENT PER YEAR  
 LINE 9 = DEPRECIABLE BASIS OR BASIS/VALUE RATIO  
 LINE 10= USEFUL LIFE OF THE DEPRECIABLE ASSET  
 LINE 11= DEPRECIATION METHOD  
 LINE 12= ORDINARY INCOME TAX RATE  
 LINE 13= TAX CREDIT  
 LINE 14= CAPITAL GAINS TAX RATE  
 LINE 15= RESALE PRICE  
 LINE 16= RESALE COMMISSION  
 LINE 17= EQUITY DISCOUNT RATE

ENTER THE LINE NUMBER TO BE CHANGED

7

THE CURRENT TERM IS 30 YEARS

ENTER THE NEW TERM

25

DO YOU WISH THE CHANGE LISTING (Y/N)

n

ENTER THE LINE NUMBER TO BE CHANGED

0

4.5 DEPRECIATION SCHEDULE MODE (D)

Mode 'D' displays the project's depreciation calculations and supporting data. This mode includes a banner listing the useful life, the depreciable basis, and the depreciation method. The output includes five columns of data: (1) depreciation claimed, (2) straight line depreciation value, (3) excess allowable depreciation over straight line, (4) cumulative excess allowable depreciation, and (5) the remaining depreciable basis; for each year of the projection period.

## EXAMPLE:

```

DEPRECIATION SCHEDULE: TRIAL
*****
USEFUL LIFE:          40 YEARS
DEPRECIABLE BASIS:   $5612930
DEP. METHOD:          150% D.B.

```

YR	DEPREC CLAIMED	S.L. DEPREC.	EXCESS DEPREC .	CUMUL. EX.DEP.	REMAIN. DEP. BASIS
1	210485	140323	70162	70162	5402445
2	202592	140323	62268	132430	5199853
3	194994	140323	54671	187101	5004859
4	187682	140323	47359	234460	4817176
5	180644	140323	40321	274781	4636532
6	173870	140323	33547	308328	4462662
7	167350	140323	27027	335354	4295312
8	161074	140323	20751	356105	4134238
9	155034	140323	14711	370816	3979204
10	149220	140323	8897	379713	3829984
	-----	-----	-----		
	1782945	1403232	379713		

#### 4.6 BACK TO BEGINING MODE (G)

Mode 'G' will restart the model from the beginning of the simulation. This mode will require the user to input all lines of the project data.

#### 4.7 INFORMATION MODE (I)

Mode 'I' provides data on each of the different modes that are available.

EXAMPLE:

##### MODES OF OPERATION:

A = AFTER TAX CASH FLOW  
AR = AFTER TAX REVERSION  
B = BEFORE TAX CASH  
C = CHANGE  
D = DEPRECIATION SCHEDULE  
G = GO BACK AND START OVER  
I = INSTRUCTIONS ON MODES  
L = LIST VARIABLE CONTENTS  
M = MORTGAGE SCHEDULE  
Q = QUIT  
R = RATES ANALYSIS  
RR = RATIO ANALYSIS  
V = VARIANCE ANALYSIS  
S = SUMMARY OF MAJOR VARIABLES  
T = TAX RATES FOR PRE 1976 TO 1982

#### 4.8 LISTING MODE (L)

Mode 'L' will allow the user to review the data that has been entered into the model. The model will print the data inputs after the user has selected the appropriate line number. The method of exiting from this mode is the same as the Change Mode, enter a 0 for the line number.

EXAMPLE:

```
ENTER THE LINE NUMBER YOU WISH TO BE LISTED
?3
```

```
THE NOI FOR THE 10 YEARS IS
710813
733812
756812
779811
802811
820810
840809
860809
894808
917808
```

```
ENTER THE LINE NUMBER YOU WISH TO BE LISTED
?0
```

4.9 MORTGAGE SCHEDULE MODE (M)

Mode 'M' displays the mortgage amortization calculations and supporting data. This mode includes a banner displaying the original principal, the interest rate, and the annual mortgage constant. The schedule contains five columns: (1) annual debt service, (2) interest payment, (3) principal amortization, (4) remaining mortgage balance, and (5) the debt coverage ratio; for each year of the projection period.

EXAMPLE:

```

MORTGAGE SCHEDULE: TRIAL
*****
PRINCIPAL:                $5612930
INTEREST RATE:             9.50%
MORTGAGE CONSTANT:        .100902

YR      ANN DEBT  INTEREST  PRINC.   REMAIN.  DEBT COV
SERVICE PAYMENT  AMORTZ.  MTG.BAL.  RATIO

1       566358    531747    34611    5578318  1.2551
2       566358    528312    38046    5540272  1.2957
3       566358    524536    41822    5498449  1.3363
4       566358    520385    45973    5452476  1.3769
5       566358    515822    50536    5401940  1.4175
6       566358    510807    55552    5346389  1.4493
7       566358    505293    61065    5285324  1.4846
8       566358    499233    67125    5218198  1.5199
9       566358    492571    73788    5144411  1.5799
10      566358    485248    81111    5063300  1.6205

-----
                    5113954  549630

```

4.10 QUIT MODE (Q)

Mode 'Q' will cancel the simulation analysis and terminate the user's session on the REAM 1 model.

4.11 RATES ANALYSIS MODE (R)

Mode 'R' displays the equity risk and rate of return analysis for the project. This mode includes a banner that includes the desired equity discount rate, the equity contribution, and the justified equity contribution. This schedule contains six columns: (1) before tax cash rate of return, (2) after tax cash rate of return, (3) before tax internal rate of return, (4) after tax internal rate of return, (5) before tax payback, and (6) after tax payback. If no equity contribution has been provided by the investor, no data outputs will be displayed on this schedule.

## EXAMPLE:

RATES ANALYSIS: TRIAL  
 \*\*\*\*\*  
 DESIRED EQ. DISC. RATE: 12.00%  
 EQUITY CONTRIBUTION: \$1403232  
 A.T. JUST. EQ. CONT.: \$1919983

YR	CASH RATE OF RETURN		INTERNAL RATE OF RETURN		PAYBACK	
	B.T.	A.T.	B.T.	A.T.	B.T.	A.T.
1	0.103	0.114	0.003	0.000	0.103	0.114
2	0.119	0.118	0.158	0.107	0.222	0.232
3	0.136	0.123	0.202	0.143	0.358	0.355
4	0.152	0.128	0.217	0.159	0.510	0.483
5	0.169	0.132	0.223	0.166	0.679	0.615
6	0.181	0.135	0.224	0.170	0.860	0.749
7	0.196	0.138	0.223	0.171	1.056	0.888
8	0.210	0.141	0.221	0.172	1.265	1.029
9	0.234	0.150	0.219	0.172	1.499	1.178
10	0.250	0.154	0.216	0.171	1.750	1.332

4.12 RATIO ANALYSIS MODE (RR)

Mode 'RR' displays the ratio analysis for the project. This mode includes a banner display of the equity discount rate, initial project cost, and the justified project value. The schedule includes six columns: (1) before tax net worth, (2) after tax net worth, (3) before tax net present value, (4) after tax net present value, (5) before tax cost-benefit ratio, and (6) after tax cost-benefit ratio.

## EXAMPLE:

RATIO ANALYSIS: TRIAL  
 \*\*\*\*\*  
 EQUITY DISC. RATE:           12.00%  
 INITIAL PROJECT COST:       \$7016162  
 A.T. JUST. PROJ. VALUE:     \$7532912

YR	NET WORTH		NET PRESENT VALUE		COST BENEFIT RATIO	
	B.T.	A.T.	B.T.	A.T.	B.T.	A.T.
1	1263204	1239821	-146394	-153806	0.896	0.890
2	1547580	1378313	92959	-29627	1.066	0.979
3	1835732	1524227	301437	79329	1.215	1.057
4	2128035	1677801	482857	174455	1.344	1.124
5	2424900	1839317	640576	257065	1.457	1.183
6	2726782	2009100	775008	327067	1.552	1.233
7	3034176	2187526	890190	386355	1.634	1.275
8	3347631	2375025	988658	436115	1.705	1.311
9	3667748	2572085	1077675	480055	1.768	1.342
10	3995189	2779259	1154550	516751	1.823	1.368

4.13 DATA SUMMARY MODE (S)

Mode 'S' displays the value of the major project variables currently being analyzed by the REAM 1 model. This mode is a quick way to check some of the important data inputs.

## EXAMPLE:

DATA SUMMARY: TRIAL  
\*\*\*\*\*

INITIAL PROJECT COST:	\$ 7016162	
NOI IN YEAR 1:	\$ 710813	VARIABLE
EQUITY CONTRIBUTION:	\$ 1403232	
DESIRED EQ. DISC. RATE:	12.00%	
HOLDING PERIOD:	10 YEARS	
ORIGINAL MORTGAGE LOAN:	\$ 5612930	
MORTGAGE INTEREST:	9.50%	
MORTGAGE TERM:	30 YEARS	
MORTGAGE CONSTANT:	.100902	
LOAN TO VALUE RATIO:	80.00%	
DEPRECIATION METHOD:	150% D.B.	
DEPRECIABLE BASIS:	\$ 5612930	
USEFUL LIFE:	40 YEARS	
ORDINARY INCOME TAX RATE:	48.00%	
CAPITAL GAINS TAX RATE:	30.00%	
RESALE PRICE:	\$ 9636690	FIXED
RESALE COMMISSION:	6.00%	

4.14 TAX RATES MODE (T)

Mode 'T' displays the individual or corporate tax rates for ordinary or capital gains income. This schedule provides tax rates from the IRS tax codes from pre 1975 to 1982.

The following is an example:

## ORDINARY INDIVIDUAL TAX RATES

PRE 1976	21% ON TAXABLE INCOME OF \$10,000. 26% ON TAXABLE INCOME OF \$20,000. 40% ON TAXABLE INCOME OF \$50,000. 70% ON TAXABLE INCOME OVER \$100,000.
1976-78	16% ON TAXABLE INCOME OF \$10,000. 22% ON TAXABLE INCOME OF \$20,000. 38% ON TAXABLE INCOME OF \$50,000. 70% ON TAXABLE INCOME OVER 102,000.
1979-81	14% ON TAXABLE INCOME OF \$10,000. 21% ON TAXABLE INCOME OF \$20,000. 36% ON TAXABLE INCOME OF \$50,000. 70% ON TAXABLE INCOME OVER \$108,300.
1982	12% ON TAXABLE INCOME OF \$10,000. 19% ON TAXABLE INCOME OF \$20,000. 50% ON TAXABLE INCOME OVER \$41,500.

## ORDINARY CORPORATE TAX RATES

PRE 1976	20% ON FIRST \$25,000 OF TAXABLE INCOME 48% ON BALANCE ON TAXABLE INCOME
1976-78	20% ON FIRST \$20,000 OF TAXABLE INCOME 22% ON NEXT \$25,000 OF TAXABLE INCOME 48% ON BALANCE OF TAXABLE INCOME
1979-81	17% ON FIRST \$25,000 OF TAXABLE INCOME 20% ON NEXT \$25,000 OF TAXABLE INCOME 30% ON NEXT \$25,000 OF TAXABLE INCOME 40% ON NEXT \$25,000 OF TAXABLE INCOME 46% ON BALANCE OF TAXABLE INCOME
1982	16% ON FIRST \$25,000 OF TAXABLE INCOME 19% ON NEXT \$25,000 OF TAXABLE INCOME 30% ON NEXT \$25,000 OF TAXABLE INCOME 40% ON NEXT \$25,000 OF TAXABLE INCOME 46% ON BALANCE OF TAXABLE INCOME

## INDIVIDUAL CAPITAL GAINS TAX RATES

PRE 1976	25%
1976-1978	25%
1979-1981	20%
1982	20%

## CORPORATE CAPITAL TAX RATES

PRE 1976	30%
1976-1978	30%
1979-1981	28%
1982	28%

4.15 VARIANCE MODE (V)

If the user is not satisfied with the investment performance of the project after the initial run, additional iterations may be necessary to identify, modify, and re-evaluate project variables that are adversely affecting the project.

Mode 'V' allows the user to enter a target output so that the model can calculate the necessary modifications to other critical variables. These target variables include before and after tax cash flow, net worth, payback, and internal rate of return.

The user may then review the schedule of possible variable modifications and select those that are most realistic. The Change Mode can then be called up and modifications made to the input data. The variance mode offers a short cut to identifying the most probable investment alternative.

## EXAMPLE:

VARIANCE ANALYSIS: trial  
\*\*\*\*\*

ENTER THE TYPE OF ANALYSIS TO BE CONSIDERED

- 1 = BEFORE TAX
- 2 = AFTER TAX

2

ENTER THE OUTPUT CATEGORY TO BE CONSIDERED

- 1 = CASH FLOW
- 2 = NET PRESENT VALUE
- 3 = PAYBACK
- 4 = INTERNAL RATE OF RETURN

1

ENTER THE AMOUNT OF AFTER TAX CASH FLOW YOU WISH TO HAVE  
200000

ENTER THE YEAR WHICH 200000 SHOULD APPEAR

1

	RELATIVE	ABSOLUTE
DECREASE THE INITIAL PROJECT COST BY:	19.26%	\$ 1351336
INCREASE THE NET OPERATING INCOME BY:	10.95%	\$ 77829
DECREASE THE MORTGAGE LOAN BY:	13.01%	\$ 730116
DECREASE THE INTEREST RATE BY:	20.54%	1.9514%
INCREASE THE DEPRECIABLE BASIS BY:	40.06%	\$ 2248399
DECREASE THE USEFUL LIFE BY:	28.60%	11 YEARS

## Chapter 5

## LOGGING OFF

Enter "Q" to end the session with REAM 1. This will put you in the command environment. To be sure you are in the command environment strike the return key twice and computer will respond with 'CMS'. Now log off of the computer by typing 'log'.

## REAM 1 CODE SHEET

NAME \_\_\_\_\_

RUN# \_\_\_\_\_

Do you want a hard copy? Y/N \_\_\_\_\_

Do you want instructions? Y/N \_\_\_\_\_

- Line 1. Project name (up to 10 characters). \_\_\_\_\_
- Line 2. Projection period in years (up to 20). \_\_\_\_\_
- Line 3. Enter the type of Net Operating Income (choose one):
- (1) variable,
- |           |            |            |            |
|-----------|------------|------------|------------|
| yr1 _____ | yr6 _____  | yr11 _____ | yr16 _____ |
| yr2 _____ | yr7 _____  | yr12 _____ | yr17 _____ |
| yr3 _____ | yr8 _____  | yr13 _____ | yr18 _____ |
| yr4 _____ | yr9 _____  | yr14 _____ | yr19 _____ |
| yr5 _____ | yr10 _____ | yr15 _____ | yr20 _____ |
- (2) constant \$ \_\_\_\_\_
- (3) compound Starting NOI \_\_\_\_\_ Growth rate \_\_\_\_\_
- Line 4. Initial project cost (up to 9 characters). \_\_\_\_\_
- Line 5. Principal or loan/value ratio. \$ \_\_\_\_\_ or \_\_\_\_\_
- Line 6. Mortgage loan interest rate. \_\_\_\_\_
- Line 7. Mortgage loan term. \_\_\_\_\_
- Line 8. Mortgage loan payments per year (1,2,3,4,6, or 12). \_\_\_\_\_
- Line 9. Depreciable basis or basis/value ratio. \$ \_\_\_\_\_ or \_\_\_\_\_
- Line 10. Useful Life. \_\_\_\_\_
- Line 11. Depreciation method (choose one):
- |                            |       |
|----------------------------|-------|
| (1) Straight Line          | _____ |
| (2) 125% Declining Balance | _____ |
| (3) 150% Declining Balance | _____ |
| (4) 200% Declining Balance | _____ |
| (5) Sum of Years Digits    | _____ |
- Display Ordinary tax rates. Y/N \_\_\_\_\_
- Line 12. Ordinary income tax rate. \_\_\_\_\_
- Is there to be an investment tax credit given. Y/N \_\_\_\_\_
- Line 13. Enter the investment tax credit. \$ \_\_\_\_\_
- Display capital gains tax rates. Y/N \_\_\_\_\_
- Line 14. Capital gains tax rate. \_\_\_\_\_
- Line 15. Enter the type of resale price (choose one):
- |   |          |
|---|----------|
| (1) compound growth rate of initial project cost. | _____    |
| (2) overall rate in year of sale.                 | _____    |
| (3) fixed dollar amount.                          | \$ _____ |
- Line 16. Enter resale commission percentage. \_\_\_\_\_
- Line 17. Enter desired equity discount rate. \_\_\_\_\_

RATES ANALYSIS: XXXXX  
 \*\*\*\*\*  
 DESIRED EQ. DISC. RATE: \_\_\_\_%  
 EQUITY CONTRIBUTION: \$ \_\_\_\_\_  
 A.T. JUST. EQ. CONT.: \$ \_\_\_\_\_

YR	CASH RATE OF RETURN		INTERNAL RATE OF RETURN		PAYBACK	
	B.T.	A.T.	B.T.	A.T.	B.T.	A.T.
1	-.____	-.____	-.____	-.____	-.____	-.____
2	-.____	-.____	-.____	-.____	-.____	-.____
3	-.____	-.____	-.____	-.____	-.____	-.____
4	-.____	-.____	-.____	-.____	-.____	-.____
5	-.____	-.____	-.____	-.____	-.____	-.____
6	-.____	-.____	-.____	-.____	-.____	-.____
7	-.____	-.____	-.____	-.____	-.____	-.____
8	-.____	-.____	-.____	-.____	-.____	-.____
9	-.____	-.____	-.____	-.____	-.____	-.____
10	-.____	-.____	-.____	-.____	-.____	-.____
11	-.____	-.____	-.____	-.____	-.____	-.____
12	-.____	-.____	-.____	-.____	-.____	-.____
13	-.____	-.____	-.____	-.____	-.____	-.____
14	-.____	-.____	-.____	-.____	-.____	-.____
15	-.____	-.____	-.____	-.____	-.____	-.____
16	-.____	-.____	-.____	-.____	-.____	-.____
17	-.____	-.____	-.____	-.____	-.____	-.____
18	-.____	-.____	-.____	-.____	-.____	-.____
19	-.____	-.____	-.____	-.____	-.____	-.____
20	-.____	-.____	-.____	-.____	-.____	-.____

RATIO ANALYSIS: XXXXX  
 \*\*\*\*\*  
 EQUITY DISC. RATE: \_\_\_\_\_ %  
 INITIAL PROJECT COST: \$ \_\_\_\_\_  
 A.T. JUST. PROJ. VALUE: \$ \_\_\_\_\_

YR	NET WORTH		NET PRESENT VALUE		COST-BENEFIT RATIO	
	B.T.	A.T.	B.T.	A.T.	B.T.	A.T.
1	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____
5	_____	_____	_____	_____	_____	_____
6	_____	_____	_____	_____	_____	_____
7	_____	_____	_____	_____	_____	_____
8	_____	_____	_____	_____	_____	_____
9	_____	_____	_____	_____	_____	_____
10	_____	_____	_____	_____	_____	_____
11	_____	_____	_____	_____	_____	_____
12	_____	_____	_____	_____	_____	_____
13	_____	_____	_____	_____	_____	_____
14	_____	_____	_____	_____	_____	_____
15	_____	_____	_____	_____	_____	_____
16	_____	_____	_____	_____	_____	_____
17	_____	_____	_____	_____	_____	_____
18	_____	_____	_____	_____	_____	_____
19	_____	_____	_____	_____	_____	_____
20	_____	_____	_____	_____	_____	_____

APPENDIX B

American Brewery REAM I Inputs

APPENDIX B

American Brewery Financial Analysis  
 REAM I Computer Inputs  
 Alternative Use: Industrial

<u>Line Description</u> Project Name	<u>Footnotes</u>	<u>Private</u> IND-PRI	<u>Joint Venture</u> IND J/V	<u>Public</u> IND PUB
Projection Period		10 Years	20 Years	20 Years
Starting NOI	B-1	\$52,024.50	\$52,024.50	\$34,887.36
Growth Rate		.05	.05	.05
Initial Project Cost	B-2	\$685,485.68	\$685,485.68	\$685,485.68
Loan to Value Ratio		.738	.738	1.00
Mortgage Loan Interest Rate	B-3	.1327	.0893	.0893
Mortgage Loan Term		20 Years	20 Years	20 Years
Mortgage Loan Payments per yr.		12/Year	4/Year	4/Year
Depreciable Basis	B-4	\$599,799.97	\$599,799.97	0
Useful Life		15 Years	15 Years	0
Depreciation Method		Straight Line	Straight Line	Straight Line
Ordinary Income Tax Rate		.50	.50	0
Investment Tax Credit	B-5	\$171,371.42	\$171,371.42	0
Capital Gains Tax Rate		.20	.20	0
Resale Price	B-6	\$448,487.07	0	0
Resale Commission		.07	0	0
Desired Equity Discount Rate		.1361	.1361	0

APPENDIX B

American Brewery Financial Analysis  
 REAM I Computer Inputs  
 Alternative Use: Office

<u>Line Description</u> Project Name	<u>Footnotes</u>	<u>Private</u> OFFICE PRI	<u>Joint Venture</u> OFFICE J/V	<u>Public</u> OFFICE PUB
Projection Period		10 Years	20 Years	20 Years
Starting NOI	B-7	\$61,388.91	\$61,388.91	\$25,032.10
Growth Rate		.05	.05	.05
Initial Project Cost	B-8	\$1,454,272.39	\$1,454,272.39	\$1,454,272.39
Loan to Value Ratio		.708	.708	1.00
Mortgage Loan Interest Rate		.135	.0893	.0893
Mortgage Loan Term		20 Years	20 Years	20 Years
Mortgage Loan Payments per yr.		12/Year	4/Year	4/Year
Depreciable Basis	B-9	\$1,272,488.34	\$1,272,488.34	0
Useful Life		15 Years	15 Years	0
Depreciation Method		Straight Line	Straight Line	Straight Line
Ordinary Income Tax Rate		.50	.50	0
Investment Tax Credit	B-10	\$363,568.10	\$363,568.10	0
Capital Gains Tax Rate		.20	.20	0
Resale Price	B-11	\$524,691.54	0	0
Resale Commission		.07	0	0
Desired Equity Discount Rate		.1361	.1361	0

APPENDIX B

American Brewery Financial Analysis  
 REAM I Computer Inputs  
 Alternative Use: Vo-Tech Skill Center

<u>Line Description</u> Project Name	<u>Footnotes</u>	<u>Private</u> VT PRI	<u>Joint Venture</u> VT J/V	<u>Public</u> VT PUB
Projection Period		10 Years	20 Years	20 Years
Starting NOI	B-12	\$245,719.98	\$245,719.98	\$189,362.19
Growth Rate		.05	.05	.05
Initial Project Cost	B-13	\$2,254,311.70	\$2,254,311.70	\$2,254,311.70
Loan to Value Ratio		.708	.708	1.00
Mortgage Loan Interest Rate	B-3	.135	.0893	.0893
Mortgage Loan Term		20 Years	20 Years	20 Years
Mortgage Loan Payments per yr		12/Year	4/Year	4/Year
Depreciable Basis	B-14	\$1,972,522.74	\$1,972,522.74	0
Useful Life		15 Years	15 Years	0
Depreciation Method		Straight Line	Straight Line	Straight Line
Ordinary Income Tax Rate		.50	.50	0
Investment Tax Credit	B-15	\$563,577.93	\$563,577.93	0
Capital Gains Tax Rate		.20	.20	0
Resale Price	B-16	\$2,100,170.77	0	0
Resale Commission		.07	0	0
Desired Equity Discount Rate		.1361	.1361	0

FOOTNOTESB:1 Starting NOI : Industrial

## Private, Joint Venture

*	Rent (triple net lease)	\$	2.50	
**	Rentable area	X	23,122	sq. ft.
	Potential gross income		57,805.00	
	Vacancy @ .10		- 5,780.50	
	NOI		<u>\$52,024.50</u>	

## Public

***	NOI before recapture		\$52,024.50	
****	Capital cost recapture		17,137.14	
	NOI		<u>\$34,887.36</u>	

- \* Maryland Planning Commission
- \*\* See note B:18
- \*\*\* See note B:1
- \*\*\*\* Recapture over 40 years

B:2 Initial Project Cost : Industrial

## Private, Joint Venture, and Public

*	Floors one-five		24,872	sq. ft.
**	Building cost	X	\$17.60	
	Floors one-five cost		<u>\$437,747.20</u>	
*	Basement area		2,120	sq. ft.
**	Building cost	X	\$11.99	
	Basement cost		<u>\$ 25,418.80</u>	
	Floors one-five cost		\$437,747.20	
	Basement cost		+ 25,418.80	
	Floors one-five & basement cost		<u>\$464,166.00</u>	
***	Project to building ratio	X	1.48	
	Initial project cost		<u>\$685,485.68</u>	
*	See note B:18			
**	See note B:19			
***	See note B:17			

B:3 Mortgage Loan Interest Rate : Industrial, Office, and Vo-Tech

\* Private

Joint Venture, Public

**	Prime rate		.105
***	Industrial revenue bond discount	X	.85
	Interest rate		<u>.0893</u>

\* Investment Bulletin No. 852, ACLI

\*\* Wall Street Journal, May 27, 1983

\*\*\* Maryland Planning Commission

B:4 Depreciable Basis : Industrial

Private, Joint Venture

	Salvage value		-0-
*	Initial project cost		\$685,485.68
**	Less $\frac{1}{2}$ investment tax credit		- 85,685.71
	Depreciable basis		<u>\$599,799.97</u>

\* See note B:2

\*\* Tax Equity and Fiscal Responsibility Act of 1982

B:5 Investment Tax Credit : Industrial

Private, Joint Venture

*	Initial project cost		\$685,485.68
**	Tax credit percent	X	.25
	Investment tax credit		<u>\$171,371.42</u>

\* See note B:2

\*\* Economic Recovery Tax Act of 1981

B:6 Resale Price : Industrial

Private

*	NOI		\$ 52,024.50
**	Capitalization rate		- .116
	Resale price		<u>\$448,487.07</u>

\* See note B:1

\*\* Investment Bulletin No. 852, ACLI

B:7 Starting NOI : Office

## Private, Joint Venture

* Rent	\$	5.95	
** Rentable area	X	23,122	sq. ft.
Potential gross income		<u>137,575.90</u>	
Vacancy @ .10	-	13,757.59	
* Operating expense @ \$2.70/sq. ft.	-	<u>62,429.40</u>	
NOI	\$	61,388.91	

## Public

*** NOI before recapture	\$	61,388.91	
**** Capital cost recapture	-	<u>36,356.81</u>	
NOI	\$	25,032.10	

\* Income/Expense Analysis Suburban Office Buildings,  
Institute of Real Estate Management, 1981 Ed.

\*\* See note B:18

\*\*\* See note B:7

\*\*\*\* Recapture over 40 years

B:8 Initial Project Cost : Office

## Private, Joint Venture, and Public

* Floors one-five area		24,872	sq. ft.
** Building cost	X	\$37.89	
Floors one-five cost	\$	<u>942,400.08</u>	
* Basement area		2,120	sq. ft.
** Building cost	X	\$18.97	
Basement cost	\$	<u>40,216.40</u>	
Floors one-five cost	\$	942,400.08	
Basement cost	+	<u>40,216.40</u>	
Floors one-five & basement cost	\$	982,616.48	
*** Project to building ratio	X	1.48	
Initial Project Cost	\$	<u>1,454,272.39</u>	

\* See note B:18

\*\* See note B:19

\*\*\* See note B:17

B:9 Depreciable Basis : Office

Private, Joint Venture

	Salvage Value	-0-
*	Initial project cost	\$1,454,272.39
**	Less $\frac{1}{2}$ investment tax credit	- 181,784.05
	Depreciable basis	<u>\$1,272,488.34</u>

\* See note B:8

\*\* Tax Equity and Fiscal Responsibility Act of 1982

B:10 Investment Tax Credit : Office

Private, Joint Venture

*	Initial project cost	\$1,454,272.39
**	Tax credit percent	X .25
	Investment tax credit	<u>\$ 363,568.10</u>

\* See note B:8

\*\* Economic Recovery Tax Act of 1981

B:11 Resale Price : Office

Private

*	NOI	\$ 61,388.91
**	Capitalization Rate	- .117
	Resale price	<u>\$ 524,691.54</u>

\* See note B:7

\*\* Investment Bulletin No. 852, ACLI

B:12 Starting NOI : Vo-Tech

## Private, Joint Venture

*	Initial project cost	\$2,254,311.70	
**	Installment to amortize factor of one	X	<u>.109</u>
***	NOI per year		245,719.98
****	Operating exp. @ \$3.15	+	72,834.30
	Potential gross income		<u>318,554.28</u>
*****	Rentable area	-	23,122 sq. ft.
	Rent per sq. ft.	\$	<u>13.78</u>

## Public

*****	NOI before recapture	\$	245,719.98
*****	Capital cost recapture	-	56,357.79
	NOI	\$	<u>189,362.19</u>

- \* See note B:13
- \*\* Rate: .0893, Term: 20 years
- \*\*\* See note B:12
- \*\*\*\* Interagency Committee for Public School Construction
- \*\*\*\*\* See note B:18
- \*\*\*\*\* See note B:12
- \*\*\*\*\* Recapture over 40 years

B:13 Initial Project Cost : Vo-Tech

## Private, Joint Venture, and Public

*	Floors one-five area		24,872 sq. ft.
**	Building cost	X	\$63.50
	Floors one-five cost		<u>\$1,579,372.00</u>
*	Basement area		2,120 sq. ft.
***	Building cost	X	\$25.56
	Basement cost	\$	<u>54,187.20</u>
	Floors one-five cost		\$1,579,372.00
	Basement cost	+	54,187.20
	Floors one-five & basement cost		<u>\$1,633,559.20</u>
****	Project to building ratio	X	1.38
	Initial project cost		<u>\$2,254,311.70</u>
*	See note B:18		
**	Maryland Department of Education		
***	See note B:19		
****	See note B:17		

B:14 Depreciable Basis : Vo-Tech

Private, Joint Venture

	Salvage value	-0-
*	Initial project cost	\$2,254,311.70
**	Less $\frac{1}{2}$ investment tax credit	- 281,788.96
	Depreciable basis	<u>\$1,972,522.74</u>

\* See note B:13

\*\* Tax Equity and Fiscal Responsibility Act of 1982

B:15 Investment Tax Credit : Vo-Tech

Private, Joint Venture

*	Initial project cost	\$2,254,311.70
**	Tax credit percent	X .25
	Investment tax credit	<u>\$ 563,577.93</u>

\* See note B:13

\*\* Economic Recovery Tax Act of 1981

B:16 Resale Price: Vo-Tech

Private

*	NOI	\$ 245,719.98
**	Capitalization rate	- .117
	Resale price	<u>\$2,100,170.77</u>

\* See note B:13

\*\* Investment Bulletin No. 852, ACLI

B:17 Project to Building Ratio

	Land cost	-0-
	Site work	.025
	Carrying cost	.065
	Fees and permits	.090
*	Startup	.100
	Contingency	+ .200
	Project to building ratio	<u>.480</u>

\* Exclude for Vo-Tech alternative

B:18

## Brewhouse Building Area

	<u>Gross Building Area</u>	-	<u>Circulation and Mechanical Area</u>	=	<u>Rentable Area</u>
Half Basement	2120	-	2120	=	-0-
Floor One	4240	-	350	=	3890
Floor Two-Five	<u>20632</u>	-	<u>1400</u>	=	<u>19232</u>
	26992	-	3870	=	23122 (sq.ft.)

$$\frac{\text{Rentable Area}}{\text{Gross Building Area}} = \frac{23122}{26992} = .86 \text{ Building Efficiency Ratio } *$$

\*Building Efficiency Ratio : the relationship of rentable building area to total or gross building area.

B:19

Construction Costs \*

April 1983: Maryland Time - Location Multiplier (1.37)\*

Steel Frame Construction

Floors 1-5

Industrial p. 0818	:	\$12.85 (\$17.60)
Office p. 0224	:	\$27.66 (\$37.89)
Vo-Tech School p. 0624:		\$28.70 (\$39.32)**

Costs Include:

Structural Floor

Roof

Finished Floor

Finished Ceiling

Partitions

Plumbing

Heating

Air Conditioning

Electrical

Fire Protection

Elevator

Stairs

Cabinets

\* Boeckh. Building Valuation Manual, Second Edition, 1979.

\*\* Not used in computer calculations

B:19 (Continued)

Construction Costs (continued)\*

Basement

Industrial	p. B802	:	\$ 8.75 (\$11.99)
Office	p. B202	:	\$13.85 (\$18.97)
Vo-Tech School	p. B602	:	\$18.66 (\$25.56)**

Costs Include:

Structural Floor

Partition

Plumbing

Heating

Air Conditioning

Fire Protection

Elevator

Stairs

\* Boeckh. Building Valuation Manual, Second Edition, 1979.

\*\* Not used in computer calculations

B:20

## Projected Operating Expenses

Industrial : lease is assumed to be triple net.Office<sup>\*</sup>

Utilities	\$1.09
Maintenance and Repair	.87
Administrative and Payroll	.30
Insurance	.08
Real Estate Taxes	<u>.36</u>

\$2.70 per square foot per year

Vo-Tech<sup>\*\*</sup>

Custodial Salaries	\$1.50
Materials	.25
Utilities	1.10
Maintenance	<u>.30</u>

\$3.15 per square foot per year

\* Maryland Interagency Committee for Public School Construction

\*\* Income/Expense Analysis Suburban Office Buildings, Institute of Real Estate Management, 1981 Ed.

APPENDIX C

American Brewery REAM I Output

for

Vo-Tech Skill Center Joint Venture Scenario

DATA SUMMARY: VO TECH J/V  
\*\*\*\*\*

INITIAL PROJECT COST:	\$	2254312	
NOI IN YEAR 1:	\$	245720	COMPOUNDED AT 5.00%
EQUITY CONTRIBUTION:	\$	658259	
DESIRED EQ. DISC. RATE:		13.61%	
HOLDING PERIOD:		20 YEARS	
ORIGINAL MORTGAGE LOAN:	\$	1596053	
MORTGAGE INTEREST:		8.93%	
MORTGAGE TERM:		20 YEARS	
MORTGAGE CONSTANT:		.107714	
LOAN TO VALUE RATIO:		70.80%	
DEPRECIATION METHOD:		STRAIGHT LINE	
DEPRECIABLE BASIS:	\$	1972523	
USEFUL LIFE:		15 YEARS	
ORDINARY INCOME TAX RATE:		50.00%	
CAPITAL GAINS TAX RATE:		20.00%	
RESALE PRICE:	\$	0	FIXED
RESALE COMMISSION:		0.00%	

MORTGAGE SCHEDULE: VO TECH J/V

\*\*\*\*\*

PRINCIPAL: \$1596053  
 INTEREST RATE: 8.93%  
 MORTGAGE CONSTANT: .107714

YR	ANN DEBT SERVICE	INTEREST PAYMENT	PRINC. AMORTZ.	REMAIN. NTG. BAL.	DEBT COV RATIO
1	171917	141529	30388	1565664	1.4293
2	171917	138723	33194	1532470	1.5008
3	171917	135658	36259	1496211	1.5758
4	171917	132310	39607	1456604	1.6546
5	171917	128653	43264	1413339	1.7373
6	171917	124658	47259	1366080	1.8242
7	171917	120294	51623	1314458	1.9154
8	171917	115527	56389	1258068	2.0112
9	171917	110321	61596	1196472	2.1117
10	171917	104633	67284	1129188	2.2173
11	171917	98421	73496	1055692	2.3282
12	171917	91634	80283	975409	2.4446
13	171917	84221	87696	887714	2.5668
14	171917	76124	95793	791921	2.6951
15	171917	67279	104638	687283	2.8299
16	171917	57617	114300	572983	2.9714
17	171917	47063	124854	448130	3.1200
18	171917	35535	136382	311748	3.2760
19	171917	22942	148975	162773	3.4398
20	171917	9186	162730	43	3.6118
		----- 1842328	----- 1596010		

DEPRECIATION SCHEDULE: VO TECH J/V  
 \*\*\*\*\*

USEFUL LIFE: 15 YEARS  
 DEPRECIABLE BASIS: \$1972523  
 DEP. METHOD: STRAIGHT LINE

YR	DEPREC. CLAIMED	S.L. DEPREC	EXCESS DEPREC.	CUMUL. EX. DEP.	REMAIN DEP. BASIS
1	131502	131502	0	0	1841021
2	131502	131502	0	0	1709520
3	131502	131502	0	0	1578018
4	131502	131502	0	0	1446517
5	131502	131502	0	0	1315015
6	131502	131502	0	0	1183514
7	131502	131502	0	0	1052012
8	131502	131502	0	0	920511
9	131502	131502	0	0	789009
10	131502	131502	0	0	657508
11	131502	131502	0	0	526006
12	131502	131502	0	0	394505
13	131502	131502	0	0	263003
14	131502	131502	0	0	131502
15	131502	131502	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
	----- 1972523	----- 1972523	----- 0		

BEFORE TAX CASH FLOW: VO TECH J/V  
 \*\*\*\*\*

YR	NOI	- ANN DEBT SERVICE	=	BTCF	+ PRINC AMORTZ	-	DEPREC CLAIMED	= TAXABLE INCOME
1	245720	171917		73803	30388		131502	-27310
2	258006	171917		86089	33194		131502	-12218
3	270906	171917		98989	36259		131502	3747
4	284452	171917		112535	39607		131502	20640
5	298674	171917		126757	43264		131502	38520
6	313608	171917		141691	47259		131502	57449
7	329288	171917		157371	51623		131502	77493
8	345753	171917		173836	56389		131502	98724
9	363040	171917		191123	61596		131502	121218
10	381192	171917		209275	67284		131502	145058
11	400252	171917		228335	73496		131502	170330
12	420265	171917		248348	80283		131502	197129
13	441278	171917		269361	87696		131502	225555
14	463342	171917		291425	95793		131502	255716
15	486509	171917		314592	104638		131502	287728
16	510834	171917		338917	114300		0	453217
17	536376	171917		364459	124854		0	489313
18	563195	171917		391278	136382		0	527660
19	591354	171917		419438	148975		0	568412
20	620922	171917		449005	162730		0	611736
					1596010		1972523	

AFTER TAX CASH FLOW: VO TECH J/V  
 \*\*\*\*\*

YR	BTCF	-	TAX LIBTY	+	TAX SAV OTH INC	+	TAX CREDIT	=	ATCF
1	73803		0		13655		563578		651036
2	86089		0		6109		0		92198
3	98989		1874		0		0		97116
4	112535		10320		0		0		102215
5	126757		19260		0		0		107497
6	141691		28724		0		0		112967
7	157371		38746		0		0		118625
8	173836		49362		0		0		124474
9	191123		60609		0		0		130514
10	209275		72529		0		0		136747
11	228335		85165		0		0		143170
12	248348		98564		0		0		149783
13	269361		112777		0		0		156583
14	291425		127858		0		0		163567
15	314592		143864		0		0		170728
16	338917		226609		0		0		112309
17	364459		244656		0		0		119803
18	391278		263830		0		0		127448
19	419438		284206		0		0		135231
20	449005		305868		0		0		143137

AFTER TAX REVERSION: VO TECH J/V  
 \*\*\*\*\*

REMAINING DEPREC. BASIS	\$	0
CAPITAL GAINS:	\$	-281789
TAX OF CAPITAL GAINS:	\$	-56358
EXCESS ALLOW. DEPRECIATION:	\$	0
TAX ON EXCESS ALLOW. DEPREC:	\$	0
RESALE PRICE:	\$	0
- RESALE COMMISSION:	\$	0
= NET RESALE PRICE:	\$	0
- OUTSTANDING MTG. BALANCE:	\$	43
= BEFORE TAX REVERSION:	\$	-43
+ TAX CREDIT AT TIME OF SALE:	\$	56358
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= AFTER TAX REVERSION:	\$	56315

RATES ANALYSIS: VO TECH J/V

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DESIRED EQ. DISC. RATE: 13.61%  
 EQUITY CONTRIBUTION: \$658259  
 A.T. JUST. EQ. CONT.: \$1272928

YR	CASH RATE OF RETURN		INTERNAL RATE OF RETURN		PAYBACK	
	B.T.	A.T.	B.T.	A.T.	B.T.	A.T.
1	0.112	0.989	-.013	0.858	0.112	0.989
2	0.131	0.140	-.002	0.556	0.243	1.129
3	0.150	0.148	0.012	0.451	0.393	1.277
4	0.171	0.155	0.027	0.403	0.564	1.432
5	0.193	0.163	0.044	0.380	0.757	1.595
6	0.215	0.172	0.062	0.371	0.972	1.767
7	0.239	0.180	0.080	0.369	1.211	1.947
8	0.264	0.189	0.099	0.371	1.475	2.136
9	0.290	0.198	0.116	0.374	1.766	2.334
10	0.318	0.208	0.132	0.378	2.083	2.542
11	0.347	0.217	0.146	0.381	2.430	2.760
12	0.377	0.228	0.158	0.384	2.800	2.987
13	0.409	0.238	0.169	0.387	3.217	3.225
14	0.443	0.248	0.177	0.389	3.660	3.474
15	0.478	0.259	0.185	0.391	4.137	3.733
16	0.515	0.171	0.191	0.392	4.652	3.904
17	0.554	0.182	0.196	0.393	5.206	4.086
18	0.594	0.194	0.200	0.393	5.800	4.279
19	0.637	0.205	0.204	0.394	6.438	4.485
20	0.682	0.217	0.207	0.394	7.120	4.702

RATIO ANALYSIS: VO TECH JV

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EQUITY DISC. RATE: 13.61%  
 INITIAL PROJECT COST: \$2254312  
 A.T. JUST. PROJ. VALUE: \$2868981

YR	NET WORTH		NET PRESENT VALUE		COST-BENEFIT RATIO	
	B.T.	A.T.	B.T.	A.T.	B.T.	A.T.
1	575932	572175	-86360	418416	0.869	1.636
2	496410	488896	-142000	364994	0.784	1.554
3	419954	408682	-172707	331144	0.738	1.503
4	346846	331817	-183349	312973	0.721	1.475
5	277394	258608	-178013	307229	0.730	1.467
6	211938	189395	-160117	311209	0.757	1.473
7	150845	124545	-132514	322669	0.799	1.490
8	94519	64461	-97572	339762	0.852	1.516
9	43400	9585	-57251	360968	0.913	1.548
10	-2032	-39604	-13163	385045	0.980	1.585
11	-41252	-82581	33372	410988	1.051	1.624
12	-73685	-118771	81283	437985	1.123	1.665
13	-98705	-147548	129706	465392	1.197	1.707
14	-115627	-168228	177952	492699	1.270	1.748
15	-123705	-180063	225479	519511	1.343	1.789
16	-122121	-155936	271868	540404	1.413	1.821
17	-109983	-121255	316800	560481	1.481	1.851
18	-86317	-75045	360040	579607	1.547	1.881
19	-50057	-16243	401422	597689	1.610	1.908
20	-43	56315	440838	614669	1.670	1.934

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