THE EFFECTS OF FINANCING AND DEVELOPMENT METHODS ON THE DESIGN OF MODERATE DENSITY HOUSING

by

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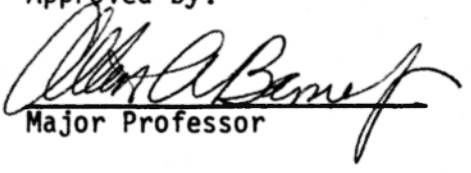

Major Professor

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CHAPTER ONE

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INTRODUCTION

Purpose

Designs produced by landscape architects and architects are of little value to a developer/client if the design cannot be built because it is financially infeasible. The most important criterion for a successful design from the client's viewpoint is profitability. The design must be financially feasible. This does not mean the designer must abandon all seemingly frivolous design elements in order to produce a design with the lowest initial construction cost possible. On the contrary, it is often the stark, low budget design with no regard for aesthetics or amenities which proves to be the least feasible. The designer must be able to add or subtract design features with the intent of maximizing the developer's long-run profitability. This linking of design and profitability is a difficult but necessary process if the designer intends to have an impact on the built environment. Engineers have been the leaders when it comes to correlating costs and design alternatives. While architects and landscape architects try to rationalize their solutions from the aesthetic or environmentally sensitive viewpoint, the engineer defends his solution from a cost standpoint. The best solution to a development problem results in the lowest long-run costs (including construction costs, maintenance costs, financing costs, and marketing costs) generating the maximum income. To succeed in the competitive and complex design market of today, a landscape architect will have to equal or surpass the engineer's ability to correlate costs with design alternatives. These correlations will have to consider more than initial construction costs for each alternate solution. The total cost to the developer, including the cost of financing and the effects of development strategies, will have to be considered. This thesis provides the basis by which landscape architects can become familiar with the development process and how it interacts with the landscape architect's design alternatives.

This study will:

- o provide an evaluation tool to compare the financial feasibility of various development methods applied to housing and possibly other land uses.
- o provide a case study illustration of how financing and development methods affect profitability.
- o explore the use of alternative development processes to improve the financial feasibility of housing.
- o provide a framework to teach designers how to evaluate their design solution's financial feasibility.

Justification

Landscape architects can provide valuable information to a developer about financing methods and its effects on the design of a development. In the past, landscape architects justified their services to the developer by providing a functional organization of spaces, increased visual appeal, and reduced construction costs, as well as obtaining approvals from the necessary government authorities. A primary goal was to work with the developer to insure a financially feasible development which projected a favorable image. As cost of construction and cost of borrowed funds increase, the influence financing has on the development process becomes more important. The designer needs to acquire an ability to intelligently communicate and provide guidance to the developer concerning basic financing and related decisions in order to insure a profitable development. The landscape architect's training which emphasizes the understanding of systems and overall organization of elements provides a basis from which to expand into the realm of elementary financing as it effects the development process.

The landscape architect has a unique opportunity and responsibility to provide an additional service early in the project's life. The landscape architect usually provides his land planning/site planning services early at a time when important financing and development process decisions are being made. If the landscape architect is knowledgeable about development financing strategies, he

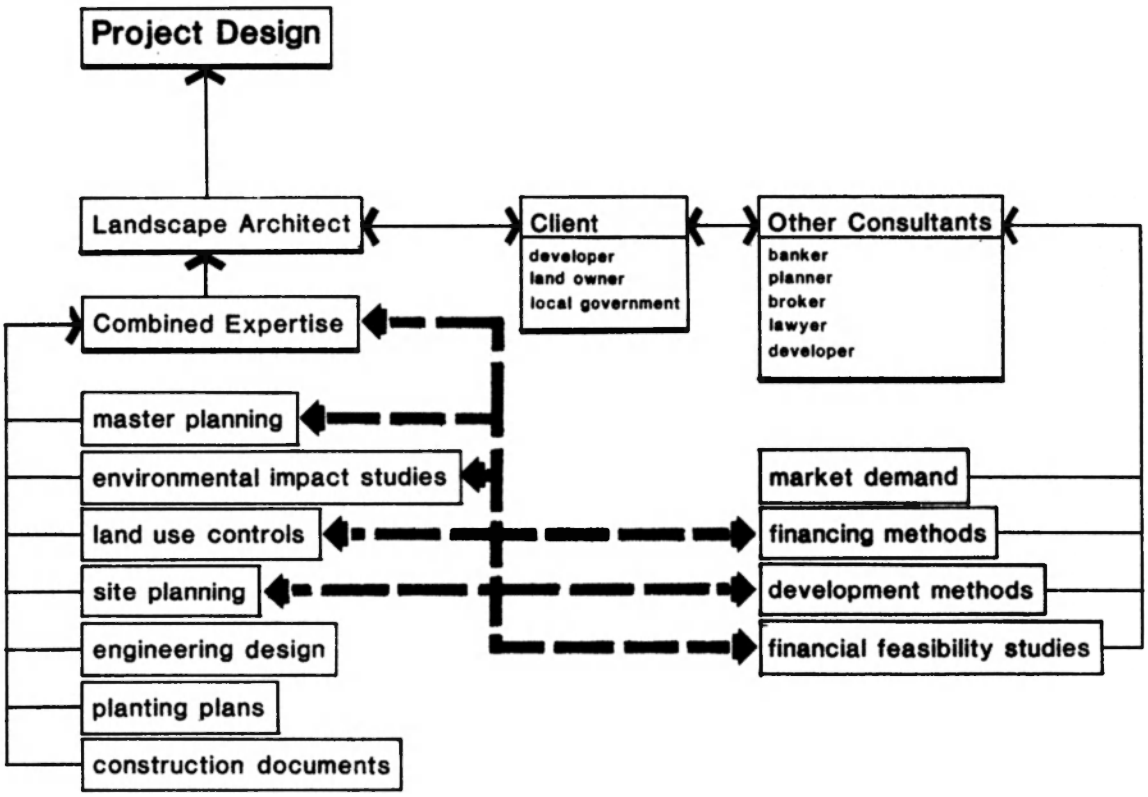

FIGURE 1.1 (Potential Role of Landscape Architect)

can provide workable expert council to his client. This additional service of determining financial feasibility, alternate financing methods, or development strategies, at a critical time in the development process is an opportunity for the landscape architect to expand his professional services, providing these in conjunction with, subsequent to, or prior to land planning and site planning.

Not only can the landscape architect provide an additional service by being knowledgeable in these areas, he can utilize this information to improve the quality of his land planning/site planning services because design opportunities and constraints can be broadened from a base dependent solely on physical characteristics of the site to one which includes financing strategies as well. As a result, the designer has additional factors to support the rationale of his plans, increasing the likelihood of a successful plan, functionally, aesthetically, and financially.

Selection Criteria of Financing Methods

This study investigates three financing and development strategies in addition to a standard financing method. The three strategies are as follows:

- Low interest municipal funds - The developer receives low cost financing in return for providing public amenities.
- High equity/phasing - The developer relies on a higher percentage of his own capital to finance the development which is phased over a longer period of time.
- Mixed use development - The developer diversifies his investment and creates self-supporting amenities by providing several land uses within the same project.

These financing methods were chosen for this study due to factors that all of the methods share, as well as factors unique to each one. All of the methods are currently used or have the potential to be widely used by developers. Methods which might be considered radical or extremely innovative were not included since this would make it more difficult to evaluate the accuracy and validity of this study's analysis technique. Through the use of more conventional financing

and development methods, this study's analysis techniques can in the future be compared with other financial feasibility studies analyzing similar financing and development methods with different analysis techniques. In addition, these relatively conventional financing methods will allow a better understanding by the non-finance oriented design student or professional. In most cases, these methods' general approach should be familiar to the design professional through contact with developer clients.

The study's finance and development methods are applicable to a variety of development types. With some minor revisions, the four methods could be used for residential developments of greater or lesser density, office developments, and commercial developments. Therefore, designers have the opportunity to apply these four methods to other land uses as part of additional financial feasibility research.

Municipal incentives was chosen as a finance method because of the increasing level of involvement which local governments are taking in real estate development. Local governments are able to greatly influence the feasibility of development projects, through the expansion of their legal powers to regulate the use and development of private property. In many cases, the primary factor affecting feasibility is the ability of the developer to comply with (or receive a variance from) the local government's zoning ordinances or subdivision regulations. In desirable areas where there is a high demand for further development, the attitude of existing residents and their governmental agencies is often one of limited or no growth. The governmental agencies are under pressure to disallow proposed developments to the fullest extent that the law provides, or to place conditions for approval which require concessions by the developer such as a decrease in density or the provision of special amenities. Through the use of the low interest municipal funds method, the developer has the opportunity to develop a team approach, working with the local government. The governmental agencies are more likely to

approve developments using this method because of the agency's increased involvement and the developer's provision of special community amenities.

In some communities, a variation of this development and finance method is routinely used in the form of performance zoning or bonus point systems. With these land use approval processes, the developer is allowed certain variances in density, land use, or other regulations in return for providing certain amenities or complying with the agency's special design guidelines. An example might be the allowance by the city or county of a 10 percent greater development density if more than 20 percent of the total development is set aside as a community open space. Another variation of the low cost municipal funding method which is routinely used today is tax increment financing. In return for providing amenities or using design approaches beneficial to the community, the developer receives concessions from the city or county which include the deferred taxation of the increase in property value due to improvements made by the developer. Landscape architects, planners, and architects working with municipalities have used this technique to create a situation where development can occur in an under-developed area, providing the city with amenities and other benefits while being profitable for the developer.

High equity/phasing is a simple finance method which addresses one of the key feasibility factors, the high cost of borrow funds. With this method, the developer simply borrows less money and uses more of his own capital while prolonging the development process. Most developments, excluding some high-rise urban developments, can utilize a phased development approach to allow a higher equity investment by the developer. Not only is high equity/phasing a simple method to apply to a variety of development types, it is also a development process with which most landscape architects are familiar. Design professionals are frequently asked to provide site plans and construction cost estimates for a phased development approach. This study attempts to determine some of the financial impacts of those

phasing decisions. Similarly, landscape architects are familiar with the mixed use development methods, where several land uses are combined on one site, but are rarely knowledgeable concerning the resulting financial feasibility. This study takes these development and finance methods familiar to designers, expands and modifies them, and then tries to determine the financial outcome.

At present, these methods are generally accepted; however, this study emphasizes certain characteristics to an extreme which usually do not occur. These development strategies are not meant to be all inclusive but rather represent some options which can dramatically affect the role and effectiveness of the landscape architect. In addition to the three alternative methods, a standard development process is analyzed in order to produce control data used for comparison of the three alternatives.

Definition of Terms

The following is a list of terms used in this study. The words are defined according to common business practice and the Dictionary of Economics by Sloan and Zurcher. In addition, some of the words which have multiple or vague definitions are further described as to their use in this study. This paper has been written with the intention that it would be read by design professionals unfamiliar with finance terms. Therefore, technical terms related to precise accounting procedures are kept to a minimum. As a rule, finance and accounting terms are used in their most general sense.

Balance Sheet - A financial report on a specific date including liabilities, assets, net worth or deficit and other related information. Value of assets and value of liabilities are listed in separate columns. Subtracting liabilities from assets gives the capital or net worth of a company. It is an instantaneous photograph of the financial status of a business.

Bankruptcy - A procedure entered into by an individual or a business whereby the federal courts administer the dissolution or reorganization of the firm's or individual's debt and protects the concerns of the debtors. If recovery seems hopeless a straight bankruptcy is filed under which all the assets are sold and distributed by the court to creditors. Persons and corporations can file for bankruptcy under one of the appropriate bankruptcy chapters.

Capital, Capital Investment - The investment of money in a business. It can also apply to cash in reserve, savings, securities and other property of value. A few economists include special skills or talents because they can be used to produce income. On financial reports, capital refers to the net worth of a company or the total of all assets less the total of all liabilities.

Capital Statement - A statement of the net worth of a company. The total of all liabilities is subtracted from all assets to determine the companies net worth. It is a brief report showing the net worth at the beginning of the reporting period, any changes during the period and the net worth at the end of the period.

Debt, Debt Commitments - A sum of money (or other agreed upon means of payment) owed or obligated to pay to another person, business or lending institution.

Debt Reduction Payment, Loan Payment - The payment or compensation given for the use of borrowed money, services or goods.

Development Process - A sequence of events related to the planning, financing, and phasing of a proposed development generally involving the subdivision of land and the implementation of improvements to the land but not directly related to marketing or construction operations for the purposes of this study.

Equity, Equity Investment - The owner's right or value of ownership after all claims and liens against it are subtracted. Used in the Phasing/High Equity method to describe the amount of capital invested by the developer into the project. This investment,

which is not borrowed but rather is capital generated from the operation of the business prior to this project, is referred to as equity. The paid-up portion of some property which is being purchased on the installment plan.

Finance, Finance Methods - The methods used to obtain capital from various sources with different terms of repayment.

Financing Process - For the purpose of this study, the manipulation of equity and borrowed capital, as used by the developer for construction and long-term loans

Financial Statement - A report prepared periodically (monthly, quarterly, and annually) by corporations to determine the financial well-being of the firm. The financial statement consists of the balance sheet, income statement and capital statement. The balance sheet reports assets and liabilities at a given moment in time. The income statement reports all sources of income and all expenses over a given period of time. The capital statement is a brief report showing the net worth at the beginning of the reporting period, any changes during the period and the net worth at the end of the period. Financial statements are used by company managers, stockholders and investors to determine appropriate actions. Variations of these statements, particularly the income statement, are used in this study to determine the financial feasibility of the financing techniques and development process.

Fund, Funds - A verb meaning to supply capital for some venture. Cash or its equivalent such as checks or money orders.

Gross - Term often used in reference to the total sales of a company, but which can refer to any total.

Gross Profit - Profit before allowing for taxes and other deductions.

Gross Sales - Total sales without deductions for charges, losses, etc. In this study, gross sales is the amount of money received for dwelling units without any deductions for expenses.

Income - Those payments received from the provision of labor, goods or the use of money.

Income Statement - A statement of profit and loss, sometimes called a profit and loss statement. It provides a complete listing of income and expenses for a given period of time. Used in conjunction with the balance sheet and the capital statement to determine the financial status of a business. This is the most useful statement for the purpose of this study since it provides a picture of the flow of income and expenses over a period of time.

Inflation - A decrease in the purchasing power of money due to the spiraling of increased prices, costs and wages. Prices inflate so the dollar buys less. Labor, asking for higher wages, forces up costs, so manufacturers must raise prices. The higher prices start the cycle again for wage increase demands. This study does not address the effects of inflation. It is assumed that the cost of construction and financing will increase at the same rate as the sales price increases. In the recent past this has not necessarily been the case; however, to generate consistent base data the assumption of no inflation is necessary. Subsequent studies can be performed which take this study's data and analyzes the different effects of inflation.

Insolvent - The condition of a company or individual whose debts (loans to be paid) exceeds assets (value of items owned) or are so extreme that financial recovery is hopeless.

Interest - A charge made for the use of someone else's money. It is usually calculated and stated as a percent of the amount borrowed (principal) or the interest rate. Indicated in formulas as "i".

Investment - Putting anything--cash, property or skills--to use for the purpose of gaining income or some other value for yourself.

Lender, Lending Institution - An individual or institution which provides the temporary use of money, goods or services with the understanding that repayment will occur, usually with interest.

Leverage - This expression means that for a small amount of cash (or other means of investment) you have the potential for much greater gains or losses. In periods of inflation, leverage can be advantageous, but it works adversely in periods of recession;

therefore, its use is quite speculative and risky. With High Equity financing, leverage is minimized since large sums of cash produce smaller gains at a lower level of risk.

Liability - The claims against a corporation or individual, including accounts payable, accrued taxes, fixed or long-term liabilities such as mortgage bonds and bank loans. In addition, liabilities in a general sense can include goods, services or the use of capital which must be paid for by the firm.

Loan - A sum of money, services or goods furnished on the condition of being repaid or returned.

Loan-to-Value Ratio - The relationship between the amount of money loaned and the market value of the item purchased or constructed with the borrowed funds.

Market Value - The price at which goods or services are selling on the open market.

Municipal Bonds, Municipal Funds - Bonds which are issued by public authorities (state, county or city). Municipal bond interest payments are generally free from federal income taxes. The tax exempt status is a privilege afforded by the federal government in order to induce investors to assist in financing local government needs. Municipal bonds can take the form of industrial revenue bonds or housing mortgage bonds as discussed in Chapter Two.

Net - A sum which allows for the deduction of charges, expenses, discounts, etc.

Net Income - The excess of revenues or sales over all expenses, including income taxes.

Net Profit - The excess of net sales and other income over all expenses, including income taxes calculated on taxable net income. Net income is the preferred term. Profit is to be used to refer to the gain on a given transaction.

Opportunity Costs - The cost of doing something that is measured in terms of the value of the lost opportunity to pursue the best alternative activity with the same time or resource.

Principal - The face amount of a loan. The sum on which interest is computed. The amount of money borrowed, indicated as "P" in formulas.

Profit - An imprecise term related to the gain from business operations. Accountants use terms like income, earnings, net, surplus, etc., and specify whether before or after certain charges, deductions, etc.

Rate of Return (R.O.R.) - The total return or profit divided by the total investment to determine an annual percentage rate. The rate at which the investment increased in value.

Ratio Analysis - The technique of reducing aggregate data from financial statements into meaningful ratios for further specialized study and analysis. The mercantile credit agency Dun & Bradstreet, Inc. publishes annual studies of the "14 Important Ratios" for specific lines of activity grouped under manufacturing, wholesaling and retail categories. The "14 Important Ratios" are as follows:

1. Current Assets to Current Debt
2. Net Profit on Net Sales
3. Net Profits on Tangible Net Worth
4. Net Profits on Net Working Capital
5. Net Sales to Tangible Net Worth
6. Net Sales to Net Working Income
7. Collection Period
8. Net Sales to Inventory
9. Fixed Assets to Tangible Net Worth
10. Current Debt to Tangible Net Worth
11. Total Debt to Tangible Net Worth
12. Inventory to Net Working Capital
13. Current Debt to Inventory
14. Funded Debt to Net Working Capital

The significant ratios vary with the line of business and with the meaningful relationships of balance sheets and operating data peculiar to it.

Revenue - A term applied to the total amount of money received from all sources by a service type industry. It is comparable to the term gross sales used by a product oriented company.

Sales - On financial reports this usually refers to net sales or the gross receipts for all goods or services sold less any allowances, guarantee costs, shortages or uncollectable accounts. At times there is a distinction of terms so that sales is used to describe the receipts from merchandise and the term revenues is used to describe the receipts from services. The two different terms never appear on a single financial statement.

CHAPTER TWO

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DEFINITION OF FINANCING AND DEVELOPMENT METHODS

Standard Financing Methods

The standard financing and development method, as outlined in this study, is intended to represent an average or typical approach used by developers today. Assuming the case study's characteristics of moderate density single-family, attached housing on a small site, the traditional and conservative approach to development would follow the standard finance method. It should be noted that the actual successful development of the case study site was very similar to the standard finance method. With the standard method the entire site is developed as one land use. The site is relatively self-contained and complete and is segregated from the surrounding properties. Some privately owned open space is reserved, but it does not have any special improvements. Based on sales expectations and the availability of material and labor, the project is phased over a five-year period with most of the construction costs and sales revenues occurring during the third and fourth years. In order to finance the project, the developer borrows 80 percent of the cost to construct the improvements at a 15% interest rate and invests 20% of his own capital. The borrowed funds are from a conventional lending institution with no special requirements for equity participation by the lender or other non-standard terms.

With the standard financing and development method, the developer is following a widely used process for developing the vacant property in a manner which is likely to create the least amount of difficulties and generate an acceptable profit. However, this method assumes the availability of borrowed funds at a reasonable interest rate, a demand for the product, and the ability to obtain local governmental approvals. The following three financing and development methods attempt to address some of these potential problems of the standard method. These alternative methods are described below with both advantages and disadvantages discussed.

Municipal Financing

Low Interest Municipal Funds provide the developer with low cost financing while the community receives additional public amenities in return. The developer constructs public amenities which serve the entire community as well as homeowners in the development. This financing method is similar in concept to financing with industrial revenue bonds, housing mortgage bonds and tax increment financing. All of these methods, which have been or are currently in wide use, are based on the concept that the local government, usually a municipality, provides a financial incentive for construction to occur which will be beneficial to the community. For instance, issuing industrial revenue bonds is a method which allows the city to provide low cost loans to businessmen and developers they wish to attract to the community. Tax exempt bonds sold by the city to investors provide the funds or capital for low cost loans. Similar to industrial revenue bonds, housing mortgage bonds are used by local and state governments to generate funds for loans to house purchasers. Mortgages are provided at a lower interest rate, with a lower down payment and a lower minimum qualifying income. Tax increment financing provides temporary property tax relief to developers as an incentive for the construction of public improvements. Developers are encouraged to improve property which is providing limited tax revenues through the incentive of postponing additional taxes on the increased value of the property once it is properly developed. Low interest municipal funds are similar to all three of these methods in that a low cost loan (or other financial incentive) is provided to a developer in return for benefits for the community.

With the municipal funds approach described in this study, the municipality finances or acquires the loan through the issue of bonds. These bonds are purchased by individuals who are seeking a safe, tax free investment. The city can pay the investors a lower than normal return on their investment since the bonds have the attractive features of tax free income with low risks. Since the city pays the investors a lower than usual return on their investment, it

can afford to provide the developer a loan with a lower than usual interest rate. The developer in return for the low interest rate loan agrees to provide certain amenities for the community.

The amenities the developer provides might include the expansion of or improvement in quality of items required by city ordinance such as public sidewalks, landscape buffers, off-street parking, street tree plantings and public park land. In addition, the city may prefer a cash donation in lieu of specific improvements. The developer should probably avoid the cash donation option. With the cash donation the developer has the same costs but his project does not directly receive any of the benefits, unless the cash donation is designated for improvements on or adjacent to the developer's site. In addition, cash donations may be used to construct improvements on or adjacent to the developer's site which are of a lower quality or conflict with the needs of future homeowners. For instance, the developer may donate cash for improvements on an adjacent park site, and then have to helplessly standby at a later date when the city decides to construct lighted basketball courts which would be disruptive to homeowners.

Municipal funding has some obvious benefits concerning low cost loans. However, it is the responsibility of the designer to ensure that any improvements, required by the city in return for the loan, are designed so that they benefit not only the community in general but also the developer's project to a greater extent. Many of the required improvements can be used as a marketing tool. Required screening or buffers between conflicting land uses can become landscaped green belts with decorative walls and/or fences. Park sites might be more fully integrated into the project to allow future homeowners to receive more of the benefits associated with park-side living. Desirable improvements such as street trees which the developer might have installed without being required can be used as a negotiating point to receive the low cost loans. In some instances, the developer negotiates and "reluctantly" agrees to construct

improvements which he fully intended to construct whether or not he received municipal assistance. The designer has a unique opportunity with the municipal financing method to maximize the benefits the development will receive from "concessions" to the city.

This entire method is subject to some question of legality. The ability of state and local governments to issue bonds is regulated by several governmental agencies. However, generally during periods when borrowed funds are not readily available through traditional sources such as banks, savings and loans and private investors, the policy has been to allow local governments to issue various bonds in order to generate an additional supply of investment money.

Phasing/High Equity

Phasing/High Equity refers to the process of developing a site with the developer relying on a higher percentage of his own capital to finance the project. Outside financing sources usually provide 80 to 100 percent of the necessary capital, with the developer contributing as much as 20 percent, or as little as his salary and overhead expenses. However, with high equity/phasing the developer uses his own accumulated capital and a smaller percentage of borrowed money, approximately 40 to 60 percent of the total necessary funding, to finance the project. This results in the developer paying interest on a smaller loan than would normally be required. With borrowed money costing 16 to 18 percent annually, these reduced loan payments would be significant. The developer's debt reduction payments to the lending institutions is a tremendous burden. By reducing these payments by as much as 60 percent, the developer's constant pressure to produce adequate income to satisfy large debt commitments is lessened.

This development process is named Phasing/High Equity because the developer's investment of 40 to 60 percent of the necessary capital leaves him having a higher equity in the development. In other words, the developer owns a higher percentage of the development. With the

developer providing 40 to 60 percent of the total funding, as opposed to the conventional 0-10 percent of the total funding, the developer is required to provide a much larger capital investment. For most developers, an investment of this size would be unreasonable; therefore, it is proposed that high equity developments be phased. Thus, the developer's equity investment is reduced by spreading it over a specified period of years. Each phase would require a smaller, more manageable investment by the developer. Over time, the accumulated developer investment would be as large as if the development was not phased. However, during that period of time each additional phase would be financed by profits from the previous phase, or from other income sources. Through phasing, the developer does not have the burden of accumulating valuable and scarce capital in unusually large amounts, as would be required if this technique were used to finance the entire project at once.

The phasing/high equity process has a large number of good and bad consequences. The most obvious and significant disadvantage of a high equity/phased development is the increased opportunity costs. Opportunity cost is the money which could be generated from the developer's capital if it were invested elsewhere. While the developer is investing his money into the high equity/phased development, he is lossing the opportunity to receive income from his investment in other areas. The developer could invest his money in safer endeavors which produce annual yields of 10-14 percent. However, if the cost of this lost opportunity to receive income from the developer's invested capital is subtracted from the savings realized by not borrowing funds for the same amount, the developer should still realize a significant savings.

The high equity process creates high opportunity costs, and the power of leverage is reduced at the same time. Leverage is the process of using a maximum of borrowed money to improve the rate of return on the investor's equity. If the developer can make a profit with a large proportion of borrowed money, the profit as a percentage

of his equity invested is much higher. The more money the developer personally invests, the less the power of leverage. While leverage has in the past (in times of high growth and inflation) been something desirable, its ability to increase risk during the current market conditions (a moderate recession) makes it less desirable. Overall, it can probably be said that leverage is still desirable but not to the extent that it was several years ago.

The reduced leverage the developer can utilize is offset by a lessening of risk to the lender and in some respects to the developer. Both of these are beneficial to the developer. First, the lending institution will reduce its risk significantly with the high equity/phased development. With high equity the lender will provide only 40-60 percent of the total required funding. This lower loan to value ratio means the lender has less to lose if the development should become unprofitable and insolvent. Loan-to-value ratio is the relationship between the amount of money loaned and the market value of the development. The market value represents the amount the lender can expect to receive in payment for the loan if the development becomes bankrupt. However, due to processing costs and claims from other sources, the actual amount obtained through bankruptcy procedures is usually much less than the market value. Therefore, if the loan-to-value ratio is lower, meaning the loan amount is much less than the market value, the lender is much more likely to receive full repayment of the loan through bankruptcy procedures, if necessary. In fact, if the lender has not subordinated his loan, it is virtually assured that in the event of bankruptcy the lender should fully recover the loan amount. In addition, the lender correctly reasons that because the developer has made such a large financial commitment to the project he will be much more willing to work to assure that it is profitable.

Both lender and developer will realize less risk due to phasing. Since investment is incremental, both can make small initial investments in an attempt to test the marketability of their product.

The first stage of development can be constructed at minimal cost in order to get an indication of consumer demand. Buyers and prospective buyers can be surveyed and the results analyzed to determine consumer needs and preferences. In response, changes can be made to later phases, each phase being improved and made more marketable by learning from mistakes and successes of the previous phase. If the developer finds the project highly unprofitable during the early phases, he has the option to stop the development before incurring any further losses.

The reduction of risk to the lender due to the high equity/phasing process results in the developer being able to obtain financing much more easily. In the current tight money market, developers are finding it difficult to obtain financing in any form. This is due to the high risk and moderate return on investment associated with recent housing developments. Lending institutions are finding other loan markets into which they can invest their holdings with greater safety. With high equity/phasing's reduced risk, some of these financing sources should be stimulated to invest once again in the housing market.

Unfortunately, some of the lender's reduced risk is at the expense of the developer. With high equity financing, the developer must make the calculated gamble of investing his personal savings in the development. This personal liability is a very real and significant risk to the developer. The risk can be discounted by some of the factors already mentioned such as having the flexibility to change the product, smaller initial investments, and reduced loan payments. The developer can also protect his personal assets not invested in the development through incorporating his development firm. It is up to the developer to believe in the value of his product to the extent that he is willing to risk investing his capital in an uncertain market. In these days of difficult economic times, it is the bold entreprenuer who capitalizes on the market insufficiencies through personal commitment of time and capital.

Due to phasing, the unit costs for the construction of infrastructure and buildings will be larger. Economies of scale, however, should be affected only moderately. Phasing a housing development, if planned carefully in advance, should not greatly increase unit costs. The early planning by the landscape architect to allow for phasing is critical if higher unit costs are to be avoided. The most important factors influencing profitability with high equity/phased developments are the negative effects of high opportunity costs, reduced leverage and greater developer liability, countered by the positive aspects of reduced financing costs, reduced lender and developer risk, and greater availability of financing. How the total rate of return for high equity/phasing compares with other financing types remains to be determined. Applying the development technique to the case study will give some actual dollar figures to analyze and compare with other development types.

Mixed Use Development

Mixed use developments with self-supporting amenities allow the developer to provide a quality environment for his development without the cost of financing non-income-producing amenities. A mixed use development could provide complimentary services for the development's residences such as a private health club, convenience store, day care center, small retail shops, and office space as appropriate to the market location. In return, the self-supporting amenities would have a readily available market provided by the development residences. The developer is able to enhance the quality of both land uses without incurring additional construction and financing costs.

Mixed use developments have grown in popularity in recent years. This growth has been in response to several factors. In many dense, urban areas, zoning ordinances are requiring a certain percentage of commercial space in conjunction with residential development. In suburban locations the mixed use approach, when used, has not been due to local regulations so much as the desire to take advantage of the

growth in demand for office and retail space. This type of development if carefully designed can provide several advantages for the developer.

The mixed use development with self-supporting amenities is a development process which diversifies the developer's investment. The developer's investment is diversified through the construction of not only residential but commercial and office space. Thus, the developer is afforded some level of protection if demand drops in the residential market but remains more constant in the retail or office market. Of course this protection can also be afforded if the commerical market has a slump while the residential market remains strong. The developer's risk is reduced since the residential and commerical markets would both have to act similarly in order to create a severe effect. This same principal of reducing your investment risk through diversification is used by corporations with a diversity of products and services, and stock brokers who recommend diversified portfolios. Prior to the recent rise in residential construction many primarily residential contractors were able to survive financially only because of their ability to shift into retail and office construction which has remained relatively more stable than residential construction. It is possible that factors such as high interest rates or sharply rising construction costs can equally effect all construction markets but the chances for severe financial losses are reduced.

In addition to a reduction in risk, the developer can also benefit from the mixed use development's ability to provide amenities at little or no costs. As mentioned previously, the mixed use approach provides the convenience of readily available services and customers.

This development approach creates some difficulties concerning zoning approval and site planning. Local governments may be reluctant to allow commercial development to occur on property zoned residential, while property zoned commercial may be too expensive to allow residential construction. Mixed use developments would usually require a PUD (Planned Unit Development) approach to land use controls

and zoning approvals. With the PUD approach the developer is usually required to prepare a site plan indicating building footprints, walkway, street and parking layout, and any special features such as screening or landscape treatments. This procedure can be expensive as far as designer's fees and lost time. The PUD approach usually takes one to two additional months to receive approval in comparison to a routine zoning request. During this extra time the developer may be paying interest on funds used to purchase the property or he may miss an opportune construction market.

Not only are there hidden costs in getting zoning approval for the mixed use development, there are also difficulties and extra costs in properly designing the development so that the different land uses are able to be integrated without negative impacts. The conflicting nature of different land uses, such as commercial versus residential was one of the principal reasons zoning or land use controls were developed. The designer's challenge is to combine and integrate the conflicting land uses while minimizing or eliminating negative impacts. Particular attention is necessary concerning the commercial development's service entrances, signage/advertising, late night lighting, and control of vehicles and pedestrians. At the same time the residential portion cannot restrict the commercial development's visibility, and general ability to attract and serve customers. Frequently designers or developers have been unwilling to attempt to resolve these conflicts resulting in the complete segregation of the different land uses which eliminates many of the self-supporting benefits. Obviously, the mixed use development has many potential pitfalls, but if the developer and designer are willing to accept the challenge the benefits of self-supporting amenities and reduced risk through diversity may be considerable.

CHAPTER THREE

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SELECTION OF CASE STUDY

The case study site and standard development approach are based on an actual development in the Chicago suburb of Winfield. The development by Hemphill and Associates was chosen in part due to its proven success during the poor residential market during 1981 and 1982. The development's successful architecture, site planning approach, and market price have been imitated by several competing developers in the Chicago area. In addition to its successful record, the development was chosen due to its small, manageable size which makes it easier for calculations and site planning modifications for this study. Basing the case study on an actual development with some modifications provides this study with costs, market strategies, and design approaches that have been proven.

The development, a townhouse project, consists of typical two-story townhouses with shared common walls. However, ownership of the site is by a condominium homeowners association, and the association is responsible for maintenance and improvements outside of the building walls. Each unit contains 1,500 square feet of floor space. The project density is 9.6 dwelling units per acre. There are no distinct characteristics on or adjacent to the site. The slopes are gentle and constant; the soils are adequate for development; and there are no existing trees. The flexible site with few development constraints allows the opportunity to modify and redesign the site according to the various financing and develoment processes examined in this study. An east-west street along the north project boundary is a minor collector which could become a major collector or arterial street when additional development occurs in the area. This street is capable of supporting a commercial development as proposed in the mixed use development alternative. The north-south street along the west boundary is a minor collector street and will probably remain so despite future development.

The standard case study development will be modified and then analyzed according to the unique characteristics of each financing and development method. By studying the same project for each alternative finance and development method, the influence of other variables is minimized and the four methods can be compared in a more valid manner. Modifications necessary to reflect the three alternative financing and development methods are described in Chapter Four.

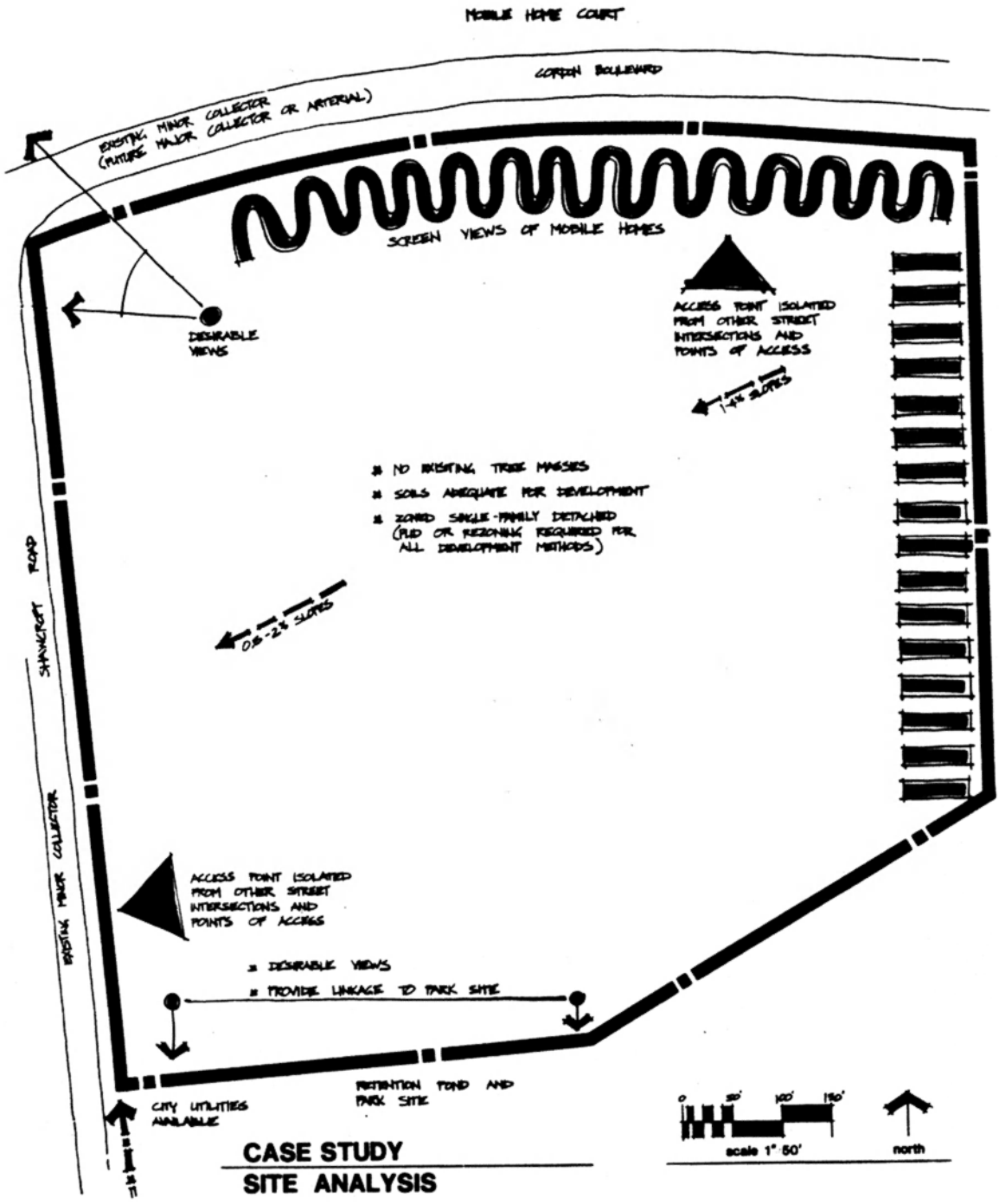

FIGURE 3.1 (Site Analysis)

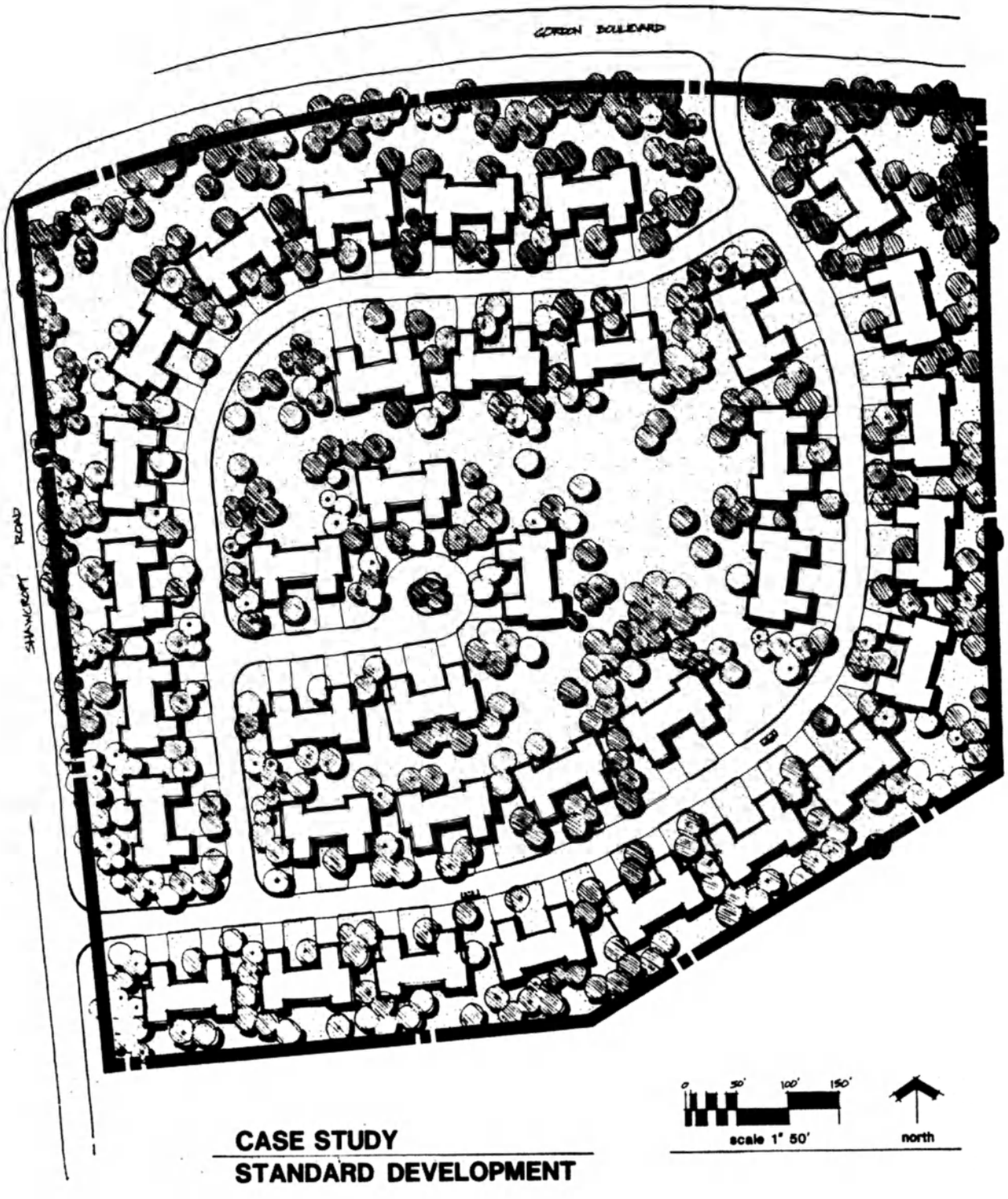

FIGURE 3.2 (Standard Development Site Plan)

CHAPTER FOUR

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APPLICATION OF FINANCING AND DEVELOPMENT METHODS TO CASE STUDY

Standard Financing Method

The study first attempts to determine the feasibility of the standard townhouse development using standard construction financing methods. In order to study the different effects of financing methods on the feasibility of residential developments, a standard of measurement must be established. Data must be collected and estimations projected based on existing information as to the cost of construction, cost of marketing, etc., as well as the expected sales price, level of market demand, and other factors outlined later in this study. The methods of determining a project's financial feasibility can vary greatly depending on the type and quantity of these various factors. The simplest feasibility analyses utilize ratios applied to a single variable to determine what the cost of the project should be. For example, a common method used to determine how much you should spend to purchase or build an apartment is to divide the annual net operating income by the rate of return you wish to make from your investment.

$$\frac{\text{Net Operating Income}}{\text{Required Rate of Return}} = \text{Amount Willing to Pay}$$

However, this type of quick analysis does not allow the developer to study the effects that other factors have on the project's profitability. As the analysis increases in detail, more factors can be studied as well as their importance to the project's success. As different factors are added to the feasibility study, the accuracy of the results is increased. However, for the study to be useful the gathering of data and the calculation of the data must not be overly time-consuming. The purpose of an anlysis technique is to organize

the available data in such a way as to give the developer a better understanding of the consequences of certain actions. Various factors are related to each other to create additional data which in turn is organized and related to other factors. The basic principle of the analysis technique is, however, to provide meaningful information in an organized manner to allow the developer to make decisions with some degree of certainty as to the consequences.

The following is a feasibility analysis of the townhouse development in its standard configuration. This analysis procedure will be used throughout this study in order to compare the effects that the different financing methods have on the development's feasibility. The study is sufficiently detailed so that many factors can be analyzed with some assurance of accuracy while not becoming overly time-consuming or cumbersome.

The first analysis, or control study, will assume the following:

1. Site Acquisition - A 15-acre site is bought at a cost of $.50 per square foot. This price is typical of undeveloped land in outlying suburbs of large metropolitan areas.

2. Building Costs - The 1,500 square foot units are constructed at a cost of $25.00 per square foot. This does not include improvements to the site such as utilities, streets and landscaping.

3. Site Improvements - Streets and utilities represent 6 percent of the total cost of construction. Landscaping improvements account for another 6 percent of the total cost of construction.

4. Management Costs - Proper architectural, site, and engineering design of the project will cost 8 percent of the development's costs. The developer's fees for managing all aspects of the project will be the same as the design fees, 8 percent.

5. Schedule of Construction and Sales - It is assumed that the project will require five (5) years to design, build and sell all units. Each year is described as follows:

Year	Units Built	Units Built %	Units Sold	Cost of St. & Ut. %	Cost of Land Imp. %	Design Fees %	Devel. Fees %
1	0	0	0	20	0	60	20
2	18	12.5	18	60	30	30	30
3	54	37.5	54	20	30	6	20
4	54	37.5	54	0	30	2	20
5	18	12.5	18	0	10	2	10
	144	100	144	100	100	100	100

TABLE 4.1: (Control Study, Schedule of Construction and Sales)

6. Insurance Premiums - Total premiums are 1 percent of the cost of construction.

7. Property Taxes - Annual payments are 7 percent of one-third of the cost of construction.

8. Marketing and Legal Expenses - The cost of advertising, maintaining model units and a sales staff as well as legal counsel should total 7 percent of gross sales (Becker, 1984).

9. Construction Financing - Interest rates are subject to dramatic changes depending upon the supply and demand for investment funds. Currently, fixed-rate mortgages range between 12 and 13 percent for individual single-family homes. The interest rates for construction loans are typically one to three percentage points higher (Martin, 1982). This control study uses an interest rate of 15 percent for the cost of a construction loan.

It is assumed that the developer has a commitment for all necessary funds from his lending source. Each year the developer borrows the necessary capital with all loans being paid in full at the completion of the project's life.

COST OF CONSTRUCTION

To determine the cost of construction six factors are analyzed. They include the following:

Site Acquisition
Building Costs
Site Improvements
    a) Streets and Utilities
    b) Landscape Improvements
Management Costs
    a) Design Fees
    b) Developer Fees

Calculations for the total cost of each element of construction are detailed below.

Site Acquisition

To acquire land for the project the developer must pay $.50/sq. ft. for undeveloped land. It is assumed that existing utilities are located adjacent to the property with sufficient capactiy to serve the 144 units to be built. The price of $.50/sq. ft. was determined through interviews with two real estate agents, one of which specializes in the sale of vacant tracts of land. Their estimates of land costs for property suitable for residential developments at a density of about 9 units per acre in the western Chicago suburbs ranged from $10,000 per acre ($.23/sq. ft.) to $1.50 per square foot or about $65,340 per acre. The development being analyzed consists of 15 acres (653,400 square feet). The cost of the site (653,400 sq. ft. x $.50/sq. ft.) is $326,700.

It is assumed that the entire 15-acre site is bought during the first year of the project's life. In reality, a development's site can be acquired in one of many different methods. It is common practice to buy an option on the site which will be developed. This means that the developer for a certain price reserves the option to buy the property. The length of time within which the option to buy can be exercised varies from a few weeks to several years. Once the developer determines the project's feasibility he can decide whether or not to buy the property. This study assumes that an option of short duration (perhaps six months) is acquired followed by the actual purchase of the site during the first year of the project's life (Martin, 1982).

Building Costs

The cost of townhouse construction is estimated at $25.00 per sq. ft. This cost includes the structure, appliances, fixtures and finishes but does not, as previously stated, include site improvements such as utilities, streets, sidewalks, patios and landscaping. Each unit contains 1,500 sq. ft. which results in a per unit cost of $37,500. The building cost for the project (144 units x $37,500) is $5,400,000.

Site Improvements

A) Streets and Utilities

It is estimated that streets and utilities will cost 6 percent of the total cost of construction. If the total cost of construction is "X," then streets and utilities will cost X(.06).

B) Landscape Improvements

Landscape improvements are estimated to cost 6 percent of the total cost of construction. If the total cost of construction is "X," then landscape improvements will cost X(.06).

About 20 percent of the budget for landscape improvements will be allocated to areas of common ownership, such as entries, street medians and open space; and the remaining 80 percent will be used for individual dwelling units.

Management Costs

A) Design Fees

The cost of hiring architectural, landscape architectural and engineering services is estimated at 8 percent of the total cost of construction. These fees include preparation of the necessary documents and presentations to obtain approval from the local government agencies, as well as design and construction drawings and specifications. If the total cost of construction is "X," then design fees will cost X(.08).

B) Developer Fees

The developer will receive 8 percent of the total cost of construction for his management services. The developer will act as the general contractor with responsibility to coordinate all subcontractor activities including the project's financing, design, construction and marketing. If the total cost of construction is "X," then developer fees will cost X(.08).

Cost of Construction

The total cost of construction can be calculated using the previously described factors as follows:

Site Acquisition	$ 326,700
Building Costs	5,400,000
Site Improvements	
a) Streets and Utilities	X(.06)
b) Landscape Improvements	X(.06)
Management Costs	
a) Design Fees	X(.08)
b) Developer's Fees	X(.08)
Total Cost of Construction	X

In order to solve "X" the following calculations are necessary:

$326,700 + $5,400,000 + X(.06) + X(.06) + X(.08) + X(.08) = X
$5,726,700 + X(.28) = X
$5,726,700 = X - X(.28) = X(.72)
$5,726,700 ÷ .72 = X
$7,953,750 = X

Now that we know the value of "X" we can substitute $7,953,750 for "X" and determine our unknown costs.

Site Acquisition	$ 326,700 =	$ 326,700
Building Costs	5,400,000 =	5,400,000
Site Improvements		
a) Streets and Utilities		
X(.06) = $7,953,750(.06)	=	477,225
b) Landscape Improvements		
X(.06) = $7,953,750(.06)	=	477,225

Management Costs		
a) Design Fees		
X(.08) = $7,953,750(.08)	=	636,300
b) Developers Fees		
X(.08) = $7,953,750(.08)	=	636,330
Total Cost of Construction		$7,953,750

These figures represent total costs over the project's five-year life. As mentioned previously, some of these costs will be concentrated in the first two years of the project's life while other costs occur more in the last two years. To get a more accurate evaluation of the project's annual cash flow, the yearly costs for these factors are analyzed.

A) Site Acquisition

All of the costs to obtain the project site are incurred during the first year.

B) Building Cost

The per unit building costs are $37,500 (1,500 sq. ft. x $25.00/sq. ft. = $37,500). During the project's first year the property is acquired, the project is designed, the necessary governmental approvals are obtained, and some of the utilities and streets are constructed. However, no construction has begun on the dwelling units. Late in the second year, construction of buildings begins and 18 units are completed. Most of the development's units are built during the third and fourth years, after revisions have been made to the original building design in response to market preferences. Only in the project's final year are the remainder of the units completed.

Year	Units Built		Cost Per Unit		Total Annual Costs
1	0	x	$37,500	=	$ 0
2	18	x	"	=	675,000
3	54	x	"	=	2,025,000
4	54	x	"	=	2,025,000
5	18	x	"	=	675,000
					$5,400,000

TABLE 4.2: (Control Study, Buildings Costs)

Site Improvements

A) Streets and Utilities

The project's streets and utilties will be constructed during the first three years of the project. Initial construction will not begin until late in the first year following site acquisition, project design and approval from local authorities. Approximately 20 percent of the total streets and utilities will be built during the first year. The majority of the streets and utilities will be built during the second year with minor improvements completed during the third year.

Year	Total Cost of Streets and Utilities		Percentage		Total Annual Cost of Streets and Utilities
1	$477,225	x	.20	=	$ 95,445
2	"	x	.60	=	286,335
3	"	x	.20	=	95,445
4	"	x	0	=	0
5	"	x	0	=	0
Total Costs of Streets and Utilities					$477,225

TABLE 4.3: (Control Study, Streets and Utilities Costs)

B) Landscape Improvements

The construction of landscape improvements will not begin until the second year after the underground improvements have been completed. Twenty percent of the costs of landscape improvements has been allotted to areas of common ownership. These high visibility features which include entries, landscape buffers, street tree plantings and open space will be completed during the second year in order to present an attractive environment to prospective home buyers. The improvements for areas of common ownership (.20 x $477,225 total landscape costs) will cost $95,445.

The remaining 80 percent of the cost of landscape improvements will be used to provide landscape to residential units (.80 x $477,225) and will cost $381,780.

Since the development includes 144 dwelling units, the per unit cost of landscape improvements for dwelling units ($381,780 ÷ 144) is $2,651.25.

Year	Land Imprvmnt. for Areas of Common Ownrshp		Number of Dwlng Unit Compltd.		Per Unit Cost of Land Impr. for Dwlng Unts		Total Annual Cost of Land Impr.
1	$ 0	+	(0	x	$2,651.25)	=	0
2	95,445	+	(18	x	")	=	143,168
3	0	+	(54	x	")	=	143,168
4	0	+	(54	x	")	=	143,168
5	0	+	(18	x	")	=	47,723
Total Cost of Landscape Improvements							$477,225

TABLE 4.4: (Control Study, Landscape Improvements Costs)

Management Costs

A) Design Fees

The majority of the design work will take place during the first year. Revisions and construction observation will require that 30 percent of the total design fees be spent during the second year. It is assumed that only minor revisions and observation will be necessary during the remainder of the project's life.

Year	Total Design Fees	Percentage	Total Annual Design Fees
1	$636,300	.60	$381,780
2	"	.30	190,890
3	"	.06	38,178
4	"	.02	12,726
5	"	.02	12,726
		Total Design Fees	$636,300

TABLE 4.5: (Control Study, Design Fees)

B) Developer Fees

The developer will have a variety of responsibilities which will require additional management efforts during different

phases of the project. As the development progresses the developer will be required to use more of his time on construction and marketing and less on financing and design. Therefore, it is assumed that the developer's fee will be generally evenly divided among the project's five-year life.

Year	Total Devlpr Fees		Percentage		Total Annual Devlpr Fees
1	$636,300	x	.20	=	$127,260
2	"	x	.30	=	190,890
3	"	x	.20	=	127,260
4	"	x	.20	=	127,260
5	"	x	.10	=	63,630
			Total Devlpr Fees		$636,300

TABLE 4.6: (Control Study, Developer Fees)

SOFT COSTS

In addition to construction costs the development will incur costs for insurance, property taxes, marketing and legal expenses, and construction financing. These costs which do not directly create a tangible product, but are nonetheless essential to a development's success, are sometimes referred to as soft costs.

Insurance

Insurance payments for a typical development are one (1) percent of the cost of construction. This would mean that the annual payments for insurance for the townhouse development ($7,953,750 cost of construction x .01) would be $79,530.

However, the developer must pay for insurance only on the portion of the development which is under construction or completed and not sold. Each year during the five-year period of construction and sales of the townhouses the developer pays a different amount for insurance.

This study allocates the total cost of insurance during each of the five years according to the number of units built. For example in year 2, 18 units are built. Eighteen units out of a total of 144

units equals 12.5 percent of the total number of units in the development. Then, 12.5 percent times the total cost of insurance equals the cost of insurance for year 2. This method provides a simple way to allocate annual insurance costs over the life of the project. Since most of the cost of insurance is related to the construction of the actual dwelling units, this method maintains an acceptable degree of accuracy.

Year	Number of Dwlng Unts Completed		Total Number of Dwlng Units		Total Cost of Insurance		Annual Cost of Insurance
1	(0	÷	144)	x	$79,538	=	$ 0
2	(18	÷	")	x	"	=	9,942
3	(54	÷	")	x	"	=	29,827
4	(54	÷	")	x	"	=	29,827
5	(18	÷	")	x	"	=	9,942
Total Cost of Insurance							$79,538

TABLE 4.7: (Control Study, Cost of Insurance)

Property Taxes

Property taxes will vary depending upon the taxing rates of the state, municipal, and local authorities in which the development is located. The case study is assumed to be located in a suburb of Chicago. Typical rates for that area are about 7 percent per 33 percent of the appraised value.

The 7 percent represents the actual tax rate, and 33 percent of appraised value represents the assessed value.

Since the total cost of construction, including site acquisition is $7,953,750, the total property tax due ($7,953,750 x .33 assessed valuation x .07 tax rate) is $183,730.

As in insurance, the developer is taxed on the portion of the development which is under construction or complete and not sold. In addition, the developer is taxed on the value of the land with no improvements on it.

Year	Number of Dwlng Units Completed		Total Number of Dwlng Units		Total Property Tax Due		Annual Property Tax Due
1	(0	÷	144)	x	$ 183,730	=	$ 0
2	(18	÷	")	x	"	=	22,966
3	(54	÷	")	x	"	=	68,899
4	(54	÷	")	x	"	=	68,899
5	(18	÷	")	x	"	=	22,966
Total Property Tax Due							$183,730

TABLE 4.8: (Control Study, Property Tax Due)

Marketing and Legal Expenses

The developer will spend approximately 7 percent of the project's gross sales ($12,240,000) in marketing and legal expenses. The total marketing and legal expenses are ($12,240,000 x .07) $856,800.

Marketing expenses include the costs of advertising, maintaining model units and a sales staff. Generally, these costs will be distributed evenly through the life of the project with some increase in costs during the second year. At that time more effort will be spent on advertising to increase public awareness of the new construction. Legal expenses include the costs of negotiating with local government authorities concerning approval of zoning and subdivision requirements. In addition, restrictive covenants for the subdivision and counsel concerning the developer's financing arrangements will be needed during the early stages of the project. An ongoing legal expense during construction of the development will be for legal service necessary whenever a dwelling unit is sold.

The marketing and legal expenses are not directly related to a single factor; therefore, it is difficult to accurately estimate the distribution of these expenses over the project's five-year life. The annual expenses for marketing and legal counsel have been allocated as follows:

Year 1	Year 2	Year 3	Year 4	Year 5
X(1.5)	X(2.0)	X(1.5)	X(1.0)	X(0.5)

In order to solve "X" the following calculations are necessary:

X(1.5) + X(2.0) + X(1.5) + X(1.0) + X(.05) =
$856,800 Total Marketing and Legal Expenses
X(6.5) = $856,800
X = $131,815

Year	Value of X				Annual Marketing and Legal Expenses
1	$131,815	x	1.5	-	$197,723
2	"	x	2.0	=	263,630
3	"	x	1.5	=	197,723
4	"	x	1.0	=	131,815
5	"	x	0.5	=	65,908
Total Marketing and Legal Expenses					$856,800

TABLE 4.9 (Control Study, Marketing and Legal Expenses)

CONSTRUCTION FINANCING

The developer will need construction financing throughout the life of the project. The construction financing will provide the developer with cash in order to buy materials and pay labor costs during construction of the project. These construction loans will be taken each year as necessary. For example, during year one $931,189 of total construction costs are incurred. The developer invests 20 percent of his own capital in order to pay these costs. The remaining 80 percent or $744,948 of construction costs are paid by a construction loan. Each year as additional construction costs are incurred the developer relies on a construction loan to pay for 80 percent of those costs. Loans are taken at the beginning of each year and repaid in annual installments. All of the construction loans will be paid in full at the end of the project's five-year life span.

The annual interest cost for the developer's construction loans is set at a constant 15 percent rate for the purpose of this study. The stability of interest rates is not a luxury afforded developers in the real world of finance. However, fluctuating financing costs are impossible to predict and can have various negative and positive effects on the project's feasibility. This study artificially sets all financing costs at a constant rate over the life of the project in order to reduce an additional variable, which could add confusion to the study's results. This study states that all factors being equal, including a constant interest rate, the project's feasibility is affected only by the techniques which are being studied.

The following formula is used to determine the annual payment necessary to repay the construction loans. A calculator with exponental capabilities will be required.

$$P \frac{(i)(1+i)^n}{(1+i)^n-1} = R$$

P = Amount of money borrowed, principal

i = Costs of borrowing money, interest rate

n = The number of payments which will be made in order to repay the loan, number of loan payments

R = The amount of the payments which will be made in order to repay the loan, loan payment

The amount of money borrowed (P) is easily determined; however, the other three variables are related to a unit of time. Interest rates (i) can be stated as an annual amount, such as 15 percent per year or as a monthly amount of 1.25 percent per month. In addition, the number of loan payments (n) and the amount of these payments (R) depend upon whether the payments are made annually or monthly. A five-year loan can be repaid with five annual payments or 60 monthly payments. It is important to remember that if the loan is repaid in annual payments then the interest rate (i) should be stated as an annual interest rate. If the loan is repaid on a monthly basis, then

the interest rate (i) must be stated as a monthly interest rate. This study assumes annual payment of the construction loan and therefore states financing charges in an annual basis.

During the first year of the controlled case study $931,185 is spent on total construction costs. In addition, $197,723 was spent on marketing and legal expenses. Soft costs such as insurance, property taxes, marketing and legal expenses, however, are considered business expenses incurred by the developer which cannot be financed by a construction loan. The developer pays for 20 percent of the total construction costs with his personal investment of $186,237.

The remaining construction costs are paid with a construction loan ($931,185 x .80) of $744.948.

The construction loan amount represents the principal (P) as stated in the formula.

$$P \frac{(i)\ (1+i)^n}{(1+i)^n-1} = R$$

$$\$744,948 \frac{(i)\ (1+i)^n}{(1+i)^n-1} = R$$

The loan will be repaid over a five-year period, with yearly payments resulting in five payments.

$$\$744,948 \frac{(i)\ (1+i)^5}{(1+i)^5-1} = R$$

Since the payments are made annually the cost of financing or interest rate is stated in an annual basis of 15 percent per year.

$$\$744,948 \frac{(.15)(1+.15)^5}{(1+.15)^5-1} = R$$

Now solve the formula as follows:

$$\$744,948 \frac{(.15)(2.01)}{(2.01)-1} = R$$

$$\$744,948 \frac{.3015}{1.01} = R$$

$$\$744,948\ (.2985) = R$$

$222,378 = R (the amount paid each year in order to repay the loan including the principal and interest)

This annual payment amount multiplied by the number of payments results in the total principal and interest cost of the loan.

$222,378 annual payment X 5 payments = $1,111,890 total principal and interest.

We know that the original amount of money borrowed (P) is $744,948. Therefore, if we subtract this figure from the total principal and interest we can determine that the total interest costs of the loan ($1,111,890 - $744,948) would be $366,942.

It is obvious that the interest or the cost of financing is very significant in relation to the cost of construction. $931,185 in total construction costs during the first year has resulted in the developer committing $186,237 of his personal funds as well as committing to the payment of $366,942 in financing costs over a five-year period. You will recall from Table 4.1 that at the end of year one (1) no dwelling units have been completed; only a portion of the streets and utilities have been completed; and there are no landscape improvements. It is at this stage of the development process that the developer is in a very tenuous situation with much at stake.

The annual loan payment (R) $222,378 includes interest and principal. In order to determine how much of R is interest and how much is principal, we divide the total costs of financing by the number of payments.

$366,942 total interest ÷ 5 payments = $73,388 interest per year

The annual loan payment of $222,378 minus the annual cost of financing $73,388 equals the annual amount of principal repaid

$222,378 annual loan payment (R) - $73,388 annual interest paid
= $148,990 annual amount of principal paid.

As a means to check your math the annual amount of principal paid calculated to be ($148,990) times five payments should equal the total loan principal (P) or amount of money borrowed $148,990 x 5 = $744,950 (P) , which was given at the beginning of these calculations.

Note that each year, additional funds are borrowed and calculated to be paid off at the end of the fifth year. During a typical five-year development process, five loans are taken, with each successive loan paid off in a period of time one year less than the previous loan. Year one interest and principal payments are only for the loan taken during the first year. However, interest and principal payments for year two include both the first year loan payments and the second year loan payments. For example, $73,388 in interest is paid each year starting with year one and continuing through year five, for the loan taken during the first year. Total interest payments during year one would be $73,388. However, year two interest payments include a $73,388 payment plus $118,903 in interest paid for the additional loan taken during year two, for a total second year interest payment of $192,291. Each year's interest and principal payment is cumulative resulting in increasingly higher amounts of debt payment as time progresses, until all loans are repaid in full at the end of year five.

In review, the following calculations are necessary to determine the annual payments for the construction loan for costs incurred during the first year.

$931,185 total construction costs in year 1
X .80 percentage of total costs borrowed
$744,948 total funds borrowed (P) at 15% interest per year (i) to be repaid annually over five years (n)

$$P \frac{(i)(1+i)^n}{(1+i)^n-1} = R$$

$$\$744,948 \frac{(.15)(1.15)^5}{(1.15)^5-1} = R$$

$$\$744,948 \frac{(.15)(2.01)}{2.01-1} = R$$

$$\$744,948 \frac{.3015}{1.01} = R$$

$\$222,378 = R$ (annual loan payment)

Each year the developer borrows the necessary funds to pay for construction costs. In year 2, construction costs are $1,486,283. The same formula that was used for year 1 will be used for year 2 except that the loan will be repaid in four years, not five years.

$1,486,283 total construction costs in year 2
X .80 percentage of total costs borrowed
$1,189,026 total funds borrowed (P) at 15% interest per year (i) to be repaid annually over four years (n)

$$P \frac{(i)(1+i)^n}{(1+i)^n-1} = R$$

$$\$1,189,026 \frac{(.15)(1.15)^4}{(1.15)^4-1} = R$$

$$\$1,189,026 \frac{.2625}{.75} = R$$

$\$1,189,026 (.35) = R$

$\$416,159 = R$ (annual loan payment)

To determine the annual principal payment and annual interest payment, we use the same series of calculations we used for the first year's loan.

$416,159 annual loan payment (R) x 4 payments =
$1,664,636 total principal and interest payment

$1,664,636 - $1,189,026 total funds borrowed (P) =
$475,610 total interest costs

$475,610 ÷ 4 payments = $118,903 interest cost per year

$416,159 annual load payment (R) - $118,903 annual interest cost = $297,257 annual principal payment

$148,990 first year loan annual principal payment
+ 297,257 second year loan annual principal payment
$446,247 total annual principal payment for year two

$ 73,388 first year loan annual interest cost
+ 118,903 second year loan annual interest cost
$192,291 total annual interest cost for year two

The following are calculations to determine the total annual construction costs, and the annual loan payment as a total and separated into annual principal payment and annual interest payment, for years three, four, and five. The calculations are the same format used for years one and two.

Year 3

$2,429,051 total construction costs
x .80 percentage of total costs borrowed
$1,943,241 total funds borrowed (P) at 15% interest per year (i) to be repaid annually over three years (n)

$$P \frac{(i)(1+i)^n}{(1+i)^n-1} = R$$

$$\$1,943,241 \frac{(.15)(1.15)^3}{(1.15)^3-1} = R$$

$$\$1,943,241 \frac{.2281}{.5209} = R$$

$$\$1,943,241 (.44) = R$$

$850,978 = annual loan payment, R

$850,978 annual loan payment x 3 payments =
$2,552,935 total principal and interest payment

$2,552,935 - $1,943,241 total funds borrowed, P =
$609,694 total interest cost

$609,694 ÷ 3 payments = $203,231 interest cost per year

$850,978 annual loan payment, R - $203,231
annual interest cost = $647,747 annual principal payment

$ 446,247 first and second year loans annual principal payment
+ 647,747 third year loan annual principal payment
$1,093,944 total annual principal payment for year three

$192,291 first and second year loans annual interest cost
+203,231 third year loan annual interest cost
$395,481 total annual interest cost for year three

Year 4

$2,308,154 total construction costs
x .80 percentage of total costs borrowed
$1,846,523 total funds borrowed (P) at 15% interest per year
(i) to be repaid annually over two years (n)

$$\$1,846,523 \frac{(1.5)\ (1.15)^2}{(1.15)^2 - 1} = R$$

$$\$1,846,523 \frac{.1984}{.3225} = R$$

$$\$1,846,523\ (.62) = R$$

$1,135,969 = annual loan payment, R

$1,135,969 annual loan payment, R x 2 payments =
$2,271,939 total principal and interest payment

$2,271,939 - $1,846,523 total funds borrowed, P =
$425,416 total interest cost

$425,416 ÷ 2 payments = $212,708 interest cost per year

$1,135,969 annual loan payment, R - $212,708
annual interest cost = $923,261 annual principal payment

$1,093,944 first, second, and third year loans annual
principal payment
+ 923,261 fourth year loan annual principal payment
$2,017,256 total annual principal payment for year four

$395,481 first, second, and third year loans annual interest cost
+212,708 fourth year loan annual interest cost
$608,189 total annual interest cost for year four

Year 5

$799,079 total construction costs
x .80 percentage of total costs borrowed
$639,263 total funds borrowed (P) at 15% interest per year
(i) to be repaid annually over one year (n)

$$\$639,263 \frac{(.15)\ (1.15)^1}{(1.15)^1 - 1} = R$$

$$\$639,263 \frac{.1725}{.1500} = R$$

$\$639,263\ (1.15) = R$

$\$735,152$ = annual loan payment, R

$\$735,152$ annual loan payment, R x 1 payment =
$\$735,152$ total principal and interest payment

$\$735,152$ - $\$639,263$ total funds borrowed, P =
$\$95,889$ total interest cost

$\$95,889 \div 1$ payment = $\$95,889$ interest cost per year

$\$735,152$ annual loan payment, R - $\$95,889$
annual interest cost = $\$639,263$ annual principal payment

$2,017,256	first, second, third, and fourth year loans annual principal payment
+ 639,263	fifth year loan annual principal payment
$2,656,519	total annual principal payment for year five

$608,189	first, second, third, and fourth year loans annual interest cost
+ 95,889	fifth year loan annual interest cost
$704,078	total annual interest cost for year five

Each year's annual profit/loss is calculated by taking the gross sales and subtracting the developer's investment, the principal and interest paid by the developer and soft costs. Construction costs for the year are paid by the developer's investment and the construction loan. Soft costs are deducted separately since they are not financed by the construction loan.

A cumulative profit/loss is calculated to show the continuing, long-term financial status of the development. An example would be the control study's annual profit for year two of $297,667 while the development has a cumulative loss for years one and two of $308,671 due to high losses during year one.

CONTROL STUDY

	Unit	Unit Quantity	Unit Income/Cost	Total Income/Cost
SALES REVENUE				
Gross Sales	D.U.	144	$ 85,000	$12,240,000
CONSTRUCTION COSTS				
Site Acquisition	AC	15	21,780	326,700
Buildings	Sq. Ft.	216,000	25,000	5,400,000
Streets & Util.	%*	6%	7,953,750	477,225
Landscape	%*	6%	7,953,750	477,225
Design Fees	%*	8%	7,953,750	636,300
Developer's Fees	%*	8%	7,953,750	636,300
Total				$7,953,750
SOFT COSTS				
Insurance	%*	1%	7,953,750	79,538
Property Taxes	%*	2.31%	7,953,750	183,730
Marketing and Legal Expenses	%**	7%	12,240,000	856,800
Total				$1,120,065
FINANCING COSTS				
Construction Loan	%***	15%	6,363,000	1,973,427
PROFIT/LOSS				$1,192,755 Profit

* Based on Cost of Construction
** Based on Gross Sales
*** Based on 80% of Cost of Construction

TABLE 4.10: (Control Study, Total Revenue/Cost Summary)

CONTROL STUDY

	YEAR 1	2	3	4	5	Total
SALES REVENUE						
Gross Sales	$ 0	$1,530,000	$4,590,000	$4,590,000	$1,530,000	$12,240,000
CONSTRUCTION COSTS						
Site Acquisition	326,700	0	0	0	0	326,700
Building Costs	0	675,000	2,025,000	2,025,000	675,000	5,400,000
Streets & Utilities	95,445	286,335	95,445	0	0	477,225
Landscape	0	143,168	143,168	143,168	47,723	477,225
Design Fees	381,780	190,890	38,178	12,726	12,726	636,300
Developer's Fees	127,260	190,890	127,260	127,260	63,630	636,300
Total	$931,185	$1,486,283	$2,429,051	$2,308,154	$799,079	$7,953,750
SOFT COSTS						
Insurance	0	9,942	29,827	29,827	9,942	79,538
Property Taxes	0	22,966	68,899	68,899	22,966	183,730
Marketing and Legal Expenses	197,723	263,630	197,723	131,815	65,908	856,800
FINANCING COSTS						
Developer's Investment (.20)	186,237	297,257	458,810	461,630	159,816	1,590,750
Construction Loan (.80)	744,948	1,189,026	1,943,241	1,846,523	639,263	6,363,001
Principal Paid	148,990	446,247	1,093,944	2,017,256	2,656,519	6,363,006
Interest Paid	73,388	192,291	395,481	608,189	704,078	1,973,427
PROFIT/LOSS						
Per Year	($606,338)	$297,667	$2,318,266	$1,272,384	($2,089,229)	$1,192,750
Cummulative	($606,338)	($308,671)	$2,009,595	$3,281,979	$1,192,750	

TABLE 4.11: (Control Study, Annual/Cumulative Revenue/Cost)

Municipal Financing

The low interest municipal funding method is identical to the standard method except for the following assumptions:

Building Costs - An additional 2,000 square feet in building area at a cost of $25.00 per square feet is constructed to provide a community building. The community building, built by the developer then donated to the appropriate governmental agency for maintenance and daily operations, will accommodate meetings, parties, workshops, and special classes for residence of the development and the surrounding community. The building will also store tools and equipment for the maintenance of the building and improvements made to the open space.

Site Improvements - Landscaping improvements account for 7 percent of the total cost of construction, increased from 6 percent in the standard method. The extra 1 percent, provides for a formal garden adjacent to the community building, a play area and an extensive walkway system linking the development to adjacent neighborhoods and the on-site community amenities.

Management Costs - The design fees have been increased from 8 percent to 8.5 percent of the total cost of construction since the design of the community building, formal garden and play area will require an extra level of effort by the design team.

Schedule of Construction and Sales - The additional cost to construct the community amenities is distributed in the same proportion as the cost of buildings, landscaping, and design fees were in the standard method.

Marketing and Legal Expenses - These costs are reduced from 7 percent to 6 percent of gross sales, since it is anticipated that the units will be easier to sell with the added amenities. There will also be an opportunity to receive free publicity due to the unique nature of the amenities as they relate to the entire community.

Construction Financing - Due to the developer's cooperation with the municipality, and through the "donation" of community amenities, the city will lend the developer capital for the entire development. This capital will be funded through the issuance of municipal bonds, and will be provided to the developers at a 13% interest rate, a decrease from the 15% interest rate of the standard method. The city can afford to offer this lower interest rate loan to the developer since the city can sell bonds to raise funds for the loan at a lower interest rate than conventional lending institution.

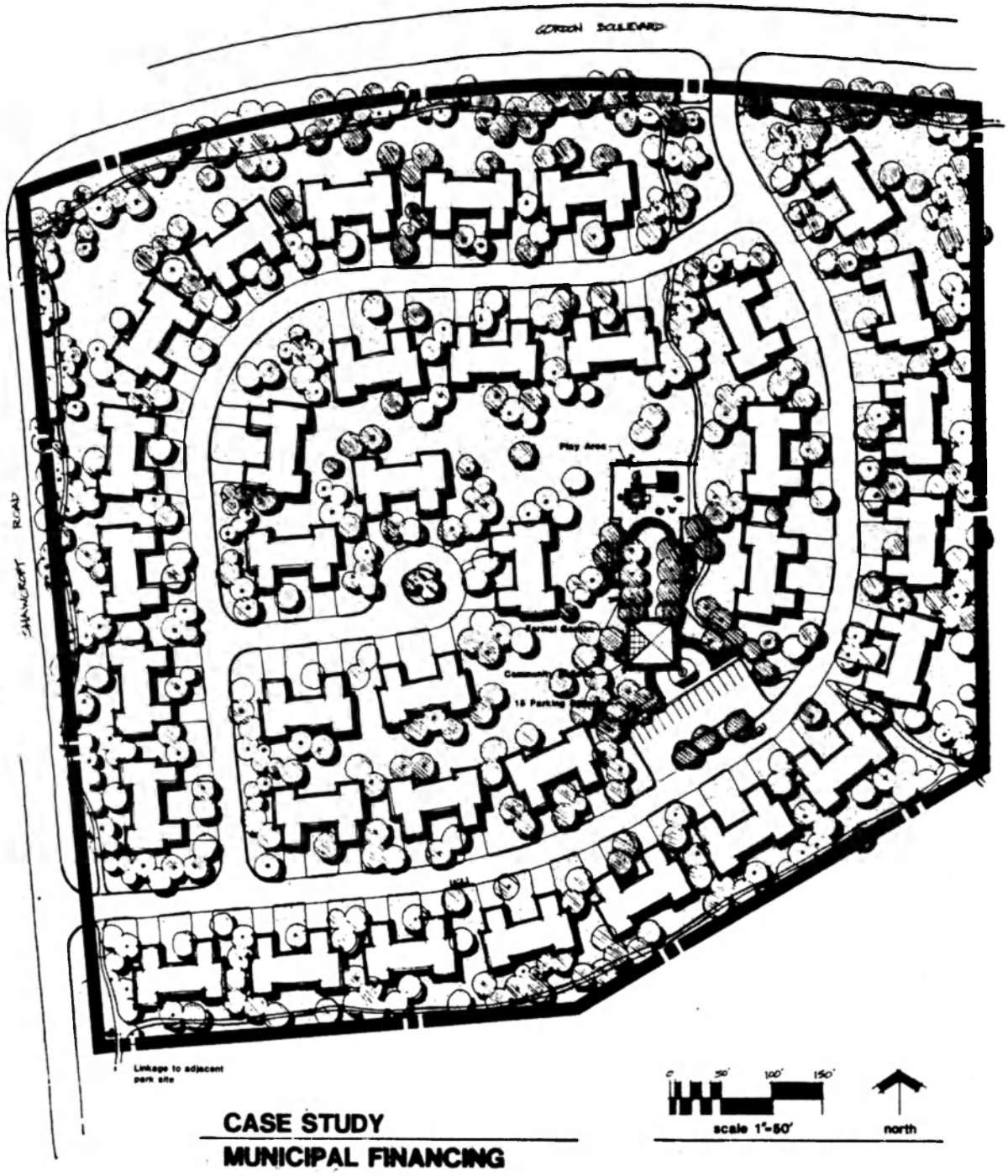

FIGURE 4.1 (Municipal Financing Site Plan)

Sales Price - The dwelling units are projected to sell at the same rate as the standard method dwelling units even if the price is increased by $5,000 per unit. The higher sales price can be justified due to the increased level of community and neighborhood amenities.

The following are calculations used to determine income, costs, and profit/loss for the municipal financing method. These calculations and those used for the Phasing/High Equity Method and the Mixed Use Method use the same mathematical formulas and formats used for the Control Study.

Site Acquisition	$ 326,700
Building Cost	5,450,000
Site Improvements	
a) Streets and Utilities	X (.06)
b) Landscape Improvements	X (.07)
Management Costs	
a) Design Fees	X(.085)
b) Developer's Fees	+ X (.08)
Total Cost of Construction	X

$5,776,700 + X (.295) = X
$5,776,700 = X (.705)
$8,193,901 = X

Site Acquisition	$ 326,700	=	$ 326,700
Building Costs	5,450,000	=	5,450,000
Site Improvements			
a) Streets and Utilities			
X (0.6) = $8,193,901 (.06)		=	491,634
b) Landscape Improvements			
X (0.7) = $8,193,901 (.07)		=	573,573
Management Costs			
a) Design Fees			
X (.085) - $8,193,901 (.085)		=	696,482
b) Developer's Fee			
X (.08) - $8,193,901 (.08)		=	655,512
Total Cost of Construction		=	$8,193,901

Total Cost of Insurance = Total Cost of Construction x 1 percent

$8,193,901 x .01 = $81,938 - Total Cost of Insurance

Annual Cost of Insurance = Total Cost of Insurance x percentage of dwelling units completed during the year

Year	Percentage of Dwelling Units Completed During Year		Total Cost of Insurance		Annual Cost of Insurance
1	0%	X	$81,938	=	0
2	12.5%	X	81,938	=	$10,242
3	37.5%	X	81,938	=	30,727
4	37.5%	X	81,938	=	30,727
5	12.5%	X	81,938	=	10,242

TABLE 4.12: (Municipal Financing, Cost of Insurance)

Total Property Tax Due = Total Cost of Construction x .33 Assessed Value x .07 Tax Rate

$8,193,901 x .33 x .07 = $189,279 Total Property Tax Due

Annual Property Tax Due = Total Property Tax Due x percentage of dwelling units completed during the year.

Year	Percentage of Dwelling Units Completed During Year		Total Property Tax Due		Annual Property Tax Due
1	0%	X	$189,279	=	0
2	12.5%	X	189,279	=	$23,660
3	37.5%	X	189,279	=	70,980
4	37.5%	X	189,279	=	70,980
5	12.5%	X	189,279	=	23,660

TABLE 4.13: (Municipal Financing, Property Tax Due)

Total Marketing and Legal Expenses = Total Gross Sales x 6 percent
$12,960,000 x .06 = $777,600 Total Marketing and Legal Expenses
Annual Marketing and Legal Expenses = Total Marketing and Legal Expenses x factor of distribution

The factors of distribution as explained in the Control Study application are variables of X (factor) which can be converted to a percentage figure and used to calculate Annual Marketing and Legal Expense as shown below.

Year	Factor of Distribution		Total Value of Factors		Total Marketing and Legal Expenses		Annual Marketing and Legal Expenses
1	1.5	÷	6.5	x	$777,600	=	$179,446
2	2.0	÷	6.5	x	777,600	=	239,262
3	1.5	÷	6.5	x	777,600	=	179,446
4	1.0	÷	6.5	x	777,600	=	119,631
5	.5	÷	6.5	x	777,600	=	59,815

TABLE 4.14: (Municipal Financing, Marketing and Legal Expenses)

$$\text{Annual Loan Payment or } R = P \frac{(i)\ (1+i)^n}{(1+i)^n - 1}$$

P = principal, money borrowed
i = interest rate, cost of money
n = number of loan payments

Year 1

$$\$779{,}214 \frac{(.13)\ (1+.13)^5}{(1+.13)^5 - 1} = \$221{,}297 \text{ Annual Loan Payment}$$

$ 417,689 x 5 years = $1,106,484 Total Loan Payment
$1,106,484 - $779,214 Principal = $327,270 Total Interest Cost
$ 327,270 ÷ 5 years = $65,454 Annual Interest Cost
$ 779,214 ÷ 5 years = $155,843 Annual Principal Payment

Year 2

$$\$1{,}243{,}121 \frac{(.13)\ (1+.13)^4}{(1+.13)^4 - 1} = \$417{,}689 \text{ Annual Loan Payment}$$

$ 221,297 x 4 years = $1,670,755 Total Loan Payment
$1,670,755 - $1,243,121 Principal = $427,634 Total Interest Cost
$ 427,634 ÷ 4 years = $106,908 Annual Interest Cost
$1,243,121 ÷ 4 years = $310,780 Annual Principal Payment

Year 1 + Year 2 annual interest costs = $172,362 total annual interest cost for year two

Year 1 + Year 2 annual principal payments = $466,623 total annual principal payment for year two

Year 3

$$\$1,989,632 \frac{(.13)\ (1+.13)^3}{(1+.13)^3 - 1} = \$841,614 \text{ Annual Loan Payment}$$

$ 841,614 x 3 years = $2,524,843 Total Loan Payment
$2,524,843 - $1,989,632 Principal = $535,211 Total Interest Cost
$ 535,211 ÷ 3 years = $178,404 Annual Interest Cost
$1,989,632 ÷ 3 years = $663,211 Annual Principal Payment

Year 1 + Year 2 + Year 3 annual interest costs = $350,766 total annual interest cost for year three

Year 1 + Year 2 + Year 3 annual principal payments = $1,129,834 total annual principal payment for year three

Year 4

$$\$1,888,683 \frac{(.13)\ (1+.13)^2}{(1+.13)^2 - 1} = \$1,131,321 \text{ Annual Loan Payment}$$

$1,131,321 x 2 years = $2,262,642 Total Loan Payment
$2,262,642 - $1,888,683 Principal = $373,959 Total Interest Cost
$ 373,959 ÷ 2 years = $186,980 Annual Interest Cost
$1,888,683 ÷ 2 years = $944,342 Annual Principal Payment

Year 1 + Year 2 + Year 3 + Year 4 annual interest costs = $537,746 total annual interest cost for year four

Year 1 + Year 2 + Year 3 + Year 4 annual principal payments = $2,074,176 total annual principal payment for year four

Year 5

$$\$654,470 \frac{(.13)\ (1+.13)^1}{(1+.13)^1 - 1} = \$739,551 \text{ Annual Loan Payment}$$

$739,551 x 1 year = $739,551 Total Loan Payment
$739,551 - $654,470 Principal = $85,081 Total Interest Cost
$ 85,081 ÷ 1 year = $85,081 Annual Interest Cost
$654,470 ÷ 1 year = $654,470 Annual Principal Payment

Year 1 + Year 2 + Year 3 + Year 4 + Year 5 annual interest costs = $622,827 total annual interest cost for year five

Year 1 + Year 2 + Year 3 + Year 4 + Year 5 annual principal payments = $2,728,648 total annual principal payment for year five

LOW INTEREST MUNICIPAL FUNDS

	Unit	Unit Quantity	Unit Income/Cost	Total Income/Cost
SALES REVENUE				
Gross Sales	D.U.	144	$ 90,000	$12,960,000
CONSTRUCTION COSTS				
Site Acquisition	AC	15	21,780	326,700
Buildings	Sq. Ft.	218,000 +	25.00	5,450,000
Streets and Utilities	%*	6%	8,193,901	491,634
Landscape	%*	7% +	8,193,901	573,573
Design Fees	%*	8.5% +	8,193,901	696,482
Developer's Fees	%*	8%	8,193,901	655,512
Total				$8,193,901
SOFT COSTS				
Insurance	%*	1%	8,193,901	81,938
Property Taxes	%*	2.31%	8,193,901	189,279
Marketing and Legal Expenses	%**	6% +	12,960,000	777,600
Total				1,048,817
FINANCING COSTS				
Construction Loan	%***	13% +	6,555,121	1,749,155
PROFIT/LOSS				$1,968,124 Profit

* Based on Cost of Construction.

** Based on Gross Sales.

*** Based on 80% of Cost of Construction.

\+ Factors of development which are different than the standard methods.

TABLE 4.15: (Municipal Financing, Total Revenue/Cost Summary)

LOW INTEREST MUNICIPAL FUNDS

	YEAR 1	2	3	4	5	Total
SALES REVENUE						
Gross Sales	$ 0	$1,620,000	$4,860,000	$4,860,000	$1,620,000	$12,960,000
CONSTRUCTION COSTS						
Site Acquisition	326,700	0	0	0	0	326,700
Building Costs	0	681,250	2,043,750	2,043,750	681,250	5,450,000
Streets and Utilities	98,327	294,980	98,327	0	0	491,634
Landscape	0	172,072	172,072	172,072	57,357	573,573
Design Fees	417,889	208,945	41,789	13,930	13,930	696,482
Developer's Fees	131,102	196,654	131,102	131,102	65,551	655,511
Total	$974,018	$1,553,901	$2,487,040	$2,360,854	$818,088	$8,193,901
SOFT COSTS						
Insurance	0	10,242	30,727	30,727	10,242	81,938
Property Taxes	0	23,660	70,980	70,980	23,660	189,279
Marketing and Legal Expenses	179,446	239,262	179,446	119,631	59,815	777,600
FINANCING COSTS						
Developer's Investment (.20)	194,804	310,780	497,408	472,171	163,618	1,638,781
Construction Loan (.80)	779,214	1,243,121	1,989,632	1,888,683	654,470	6,555,121
Principal Paid	155,843	466,623	1,129,834	2,074,176	2,728,646	6,555,121
Interest Paid	65,454	172,362	350,766	537,746	622,827	1,749,155
PROFIT/LOSS						
Per Year	($595,547)	$397,071	$2,600,839	$1,554,569	($1,988,808)	$1,968,124
Cummulative	($595,647)	($198,476)	$2,402,363	$3,956,932	$1,968,124	

TABLE 4.16: (Municipal Financing, Annual/Cumulative Revenue/Cost)

Phasing/High Equity

The following is a list of assumptions which are different than the standard finance and development method assumptions. All other assumptions are identical.

Building Costs - Total building cost is the same, however, the costs are spread over a ten-year period.

Management Costs - The design fees have been increased from 8 percent to 9 percent due to the prolonged construction observation services and the desire to modify the buildings as the market responds to the early phases. The developer's fees are also increased from 8 percent to 9 percent due to the additional effort required to manage an orderly phasing of the development, coordinate modifications in later phases as desired, and extend involvement over five more years.

Schedule of Construction and Sales - The project is developed over a ten-year period, five years more than the standard method. Each year is described as follows:

Year	Units Built	Units Built %	Units Sold	Cost of St. & Ut. %	Cost of Land. Imp. %	Design Fees %	Develop. Fees %
1	0	0	0	10	0	40	17
2	9	6.3	9	30	15	20	13
3	18	12.5	18	30	10	3	10
4	18	12.5	18	10	10	1	8
5	27	18.8	27	5	15	1	15
6	27	18.8	27	5	25	20	12
7	18	12.5	18	5	10	10	10
8	9	6.3	9	5	5	3	5
9	9	6.3	9	0	5	1	5
10	9	6.3	9	0	5	1	5
	144	100	144	100	100	100	100

TABLE 4.17: (Phasing/High Equity, Schedule of Construction and Sales)

Marketing and Legal Expenses - Some additional cost would be incurred due to two sets of models being built, one set in the second year and the other set in the sixth year. Two sets of models would be necessary since the buildings would be modified after the fifth year in response to feedback from consumers during the earlier phases. Marketing efforts would also be prolonged over a greater length of time. However these extra costs would be

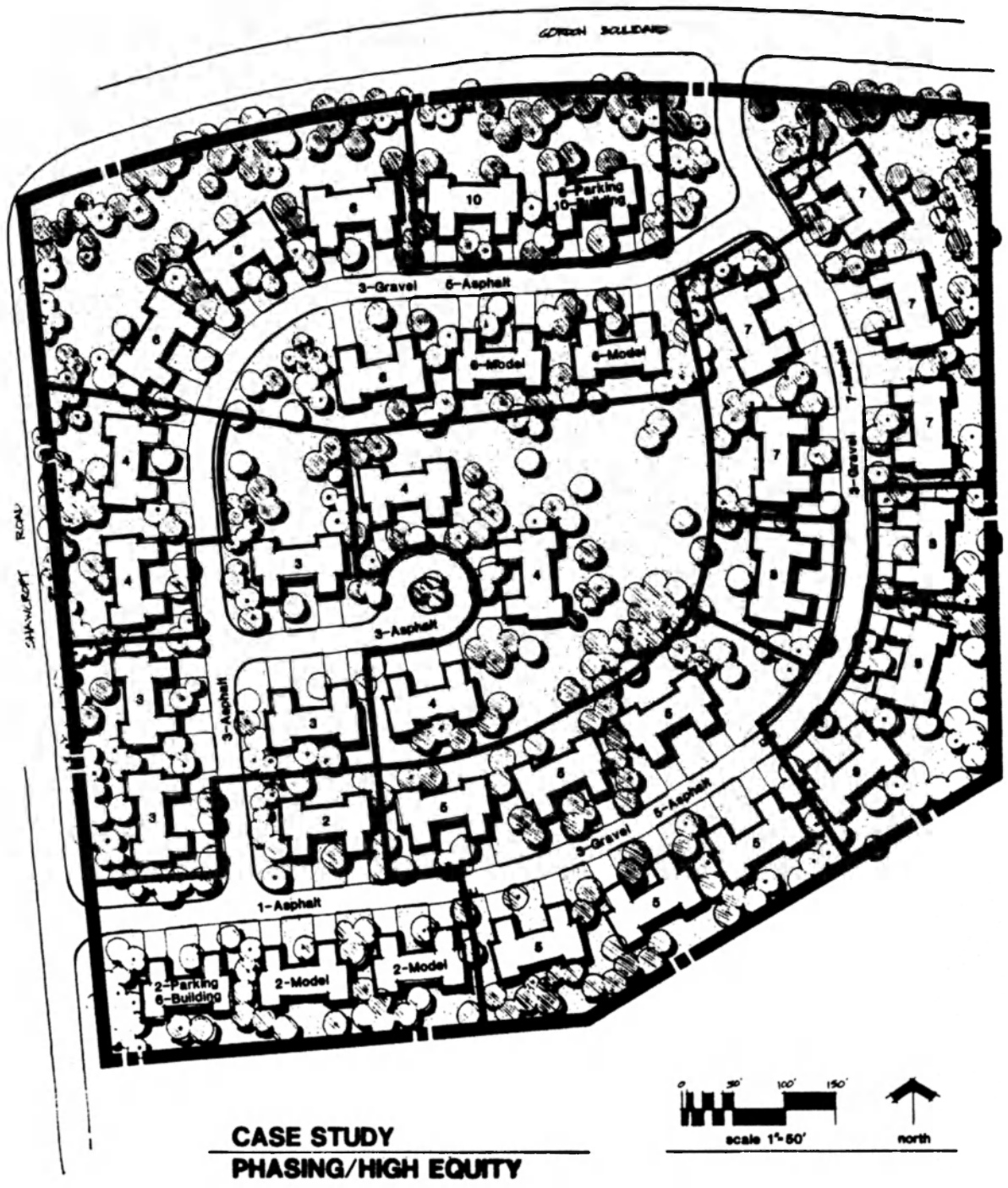

FIGURE 4.2 (Phasing/High Equity Site Plan)

off-set by the increased marketability of the dwelling units due to the responsive modifications, and the decrease in effort required to generate sales of fewer units per year in comparison with the standard method.

Calculations

Site Acquisition	$ 326,700
Building Costs	5,450,000
Site Improvements	
a) Streets and Utilities	X (.06)
b) Landscape Improvements	X (.07)
Management Costs	
a) Design Fees	X (.09)
b) Developer's Fees	+ X (.09)
Total Cost of Construction	X

$5,726,700 + X (.30) = X
$5,726,700 = X (.70)
$8,181,000 = X

Site Acquisition	$ 326,700		$ 326,700
Building Costs	5,400,000	=	5,400,000
Site Improvements			
a) Streets and Utilities			
X (0.6) = $8,181,000 (.06)		=	490,860
b) Landscape Improvements			
X (0.7) = $8,181,000 (.07)		=	490,860
Management Costs			
a) Design Fees			
X (.09) = $8,181,000 (.09)		=	736,290
b) Developer's Fee			
X (.09) = $8,181,000 (.09)		=	736,290
Total Cost of Construction		=	$8,181,000

Total Cost of Insurance = Total Cost of Construction x 1 percent

$8,181,001 x .01 = $81,810 = Total Cost of Insurance

Annual Cost of Insurance = Total Cost of Insurance x percentage of dwelling units completed during the year

Year	Percentage of Dwelling Units Completed During Year		Total Cost of Insurance		Annual Cost of Insurance
1	0%	X	$81,810	=	0
2	6.25%	X	81,810	=	$ 5,113
3	12.5%	X	81,810	=	10,226
4	12.75%	X	81,810	=	10,226
5	18.5%	X	81,810	=	15,339
6	18.75%	X	81,810	=	15,339
7	12.5%	X	81,810	=	10,226
8	6.25%	X	81,810	=	5,113
9	6.25%	X	81,810	=	5,113
10	6.25%	X	81,810	=	5,113

TABLE 4.18: (Phasing/High Equity, Cost of Insurance)

Total Property Tax Due = Total Cost of Construction x .33 Assessed Value x .07 Tax Rate

$8,181,000 x .33 x .07 = $188,981 Total Property Tax Due

Annual Property Tax Due = Total Property Tax Due x percentage of dwelling units completed during the year.

Year	Percentage of Dwelling Units Completed During Year		Total Property Tax Due		Annual Property Tax Due
1	0%	X	$188,981	=	0
2	6.25%	X	188,981	=	$11,811
3	12.5%	X	188,981	=	23,623
4	12.5%	X	188,981	=	23,623
5	18.75%	X	188,981	=	35,434
6	18.75%	X	188,981	=	35,434
7	12.5%	X	188,981	=	23,623
8	6.25%	X	188,981	=	11,811
9	6.25%	X	188,981	=	11,811
10	6.25%	X	188,981	=	11,811

TABLE 4.19: (Phasing/High Equity, Property Tax Due)

Total Marketing and Legal Expenses = Total Gross Sales x 7 percent
$12,240,000 x .07 = $856,800 Total Marketing and Legal Expenses
Annual Marketing and Legal Expenses = Total Marketing and Legal Expenses x factor of distribution

The factors of distribution as explained in the Control Study application are variable of X (factor) which can be converted to a percentage figure and used to calculate Annual Marketing and Legal Expense as shown below.

Year	Factor of Distribution		Total Value of Factors		Total Marketing and Legal Expanses		Annual Marketing and Legal Legal Expenses
1	2	÷	14	x	$856,800	=	$122,400
2	2.66	÷	14	x	856,800	=	163,200
3	2	÷	14	x	856,800	=	122,400
4	1.33	÷	14	x	856,800	=	81,600
5	0.66	÷	14	x	856,800	=	40,800
6	2	÷	14	x	856,800	=	$122,400
7	1.33	÷	14	x	856,800	=	$81,600
8	0.66	÷	14	x	856,800	=	40,800
9	0.66	÷	14	x	856,800	=	40,800
10	0.66	÷	14	x	856,800	=	40,800

TABLE 4.20: (Phasing/High Equity, Marketing and Legal Expenses)

$$\text{Annual Loan Payment or } R = P \frac{(i)\ (1+i)^n}{(1+i)^n - 1}$$

P = principal, money borrowed
i = interest rate, cost of money
n = number of loan payments

Year 1

$$\$397,736 \frac{(.15)\ (1+.15)^5}{(1+.15)^5 - 1} = \$118,646 \text{ Annual Loan Payment}$$

$118,646 x 5 years = $593,230 Total Loan Payment
$593,230 - $397,736 Principal = $195,494 Total Interest Cost
$195,494 ÷ 5 years = $39,099 Annual Interest Cost
$397,736 ÷ 5 years = $79,547 Annual Principal Payment

Year 2

$$\$400{,}682 \frac{(.15)\ (1+.15)^4}{(1+.15)^4 - 1} = \$140{,}346 \text{ Annual Loan Payment}$$

$140,346 x 4 years = $561,385 Total Loan Payment
$561.385 - $400,682 Principal = $160,703 Total Interest Cost
$160,703 ÷ 4 years = $40,176 Annual Interest Cost
$400,682 ÷ 4 years = $100,171 Annual Principal Payment

Year 1 + Year 2 annual interest costs = $79,275 total annual interest cost for year two

Year 1 + Year 2 annual principal payments = $179,718 total annual principal payment for year two

Year 3

$$\$483{,}531 \frac{(.15)\ (1+.15)^3}{(1+.15)^3 - 1} = \$211{,}765 \text{ Annual Loan Payment}$$

$211,765 x 3 years = $635,296 Total Loan Payment
$635,296 - $483,531 Principal = $151,765 Total Interest Cost
$151,765 ÷ 3 years = $50,588 Annual Interest Cost
$483,531 ÷ 3 years = $161,177 Annual Principal Payment

Year 1 + Year 2 + Year 3 annual interest costs = $129,863 total annual interest cost for year three

Year 1 + Year 2 + Year 3 annual principal payments = $340,895 total annual principal payment for year three

Year 4

$$\$419{,}719 \frac{(.15)\ (1+.15)}{(1+.15)^2 - 1}^2 = \$258{,}176 \text{ Annual Loan Payment}$$

$258,176 x 2 years = $516,352 Total Loan Payment
$516,352 - $419,719 Principal = $96,633 Total Interest Cost
$ 96,633 ÷ 2 years = $48,316 Annual Interest Cost
$419,719 ÷ 2 years = $209,860 Annual Principal Payment

Year 1 + Year 2 + Year 3 + Year 4 annual interest costs = $178,179 total annual interest cost for year four

Year 1 + Year 2 + Year 3 + Year 4 annual principal payments = $550,755 total annual principal payment for year four

Year 5

$$\$614{,}240 \frac{(.15)\ (1+.15)^{1}}{(1+.15)^{1}-1} = \$706{,}376 \text{ Annual Loan Payment}$$

$706,376 x 1 year = $706,376 Total Loan Payment
$706,376 - $614,240 Principal = $92,126 Total Interest Cost
$ 92,136 ÷ 1 year = $92,136 Annual Interest Cost
$614,240 ÷ 1 year = $614,240 Annual Principal Payment

Year 1 + Year 2 + Year 3 + Year 4 + Year 5 annual interest costs = $270,315 total annual interest cost for year five

Year 1 + Year 2 + Year 3 + Year 4 + Year 5 annual principal payments = $1,164,995 total annual principal payment for year five

Year 6

$$\$697{,}686 \frac{(.15)\ (1+.15)^{5}}{(1+.15)^{1}-1} = \$208{,}122 \text{ Annual Loan Payment}$$

$ 208,122 x 5 years = $1,040,609 Total Loan Payment
$1,040,609 - $697,686 Principal = $342,923 Total Interest Cost
$ 342,923 ÷ 5 year = $68,585 Annual Interest Cost
$ 697,686 ÷ 5 year = $139,537 Annual Principal Payment

Loans from Years 1 through 5 were paid off at the end of Year 5 so the only interest and principal due at the end of Year 6 is from the Year 6 loan

Year 7

$$\$447{,}944 \frac{(.15)\ (1+.15)^{4}}{(1+.15)^{4}-1} = \$156{,}930 \text{ Annual Loan Payment}$$

$156,930 x 4 years = $627,720 Total Loan Payment
$627,720 - $447,944 Principal = $179,776 Total Interest Cost
$179,776 ÷ 4 years = $44,944 Annual Interest Cost
$447,944 ÷ 4 years = $111,986 Annual Principal Payment

Year 6 + Year 7 annual interest costs = $113,529 total annual interest cost for year seven

Year 6 + Year 7 annual principal payments = $251,523 total annual principal payment for year seven

Year 8

$$\$222,745 \frac{(.15)\ (1+.15)^3}{(1+.15)^3 - 1} = \$97,539 \text{ Annual Loan Payment}$$

$ 97,539 x 3 years = $292,617 Total Loan Payment
$292,617 - $222,745 Principal = $69,872 Total Interest Cost
$ 69,872 ÷ 3 years = $23,291 Annual Interest Cost
$222,745 ÷ 3 years = $74,248 Annual Principal Payment

Year 6 + Year 7 + Year 8 annual interest costs = $136,820 total annual interest cost for year eight

Year 6 + Year 7 + Year 8 annual principal payments = $325,771 total annual principal payment for year eight

Year 9

$$\$203,111 \frac{(.15)\ (1+.15)^2}{(1+.15)^2 - 1} = \$124,953 \text{ Annual Loan Payment}$$

$124,953 x 2 years = $249,905 Total Loan Payment
$249,905 - $203,111 Principal = $46,794 Total Interest Cost
$ 46,794 ÷ 2 years = $23,397 Annual Interest Cost
$203,111 ÷ 2 years = $101,556 Annual Principal Payment

Year 6 + Year 7 + Year 8 + Year 9 annual interest costs = $160,217 total annual interest cost for year nine

Year 6 + Year 7 + Year 8 + Year 9 annual principal payments = $427,327 total annual principal payment for year nine

Year 10

$$\$203,111 \frac{(.15)\ (1+.15)^1}{(1+.15)^1 - 1} = \$233,578 \text{ Annual Loan Payment}$$

$233,578 x 1 year = $233,578 Total Loan Payment
$233,578 - $203,111 Principal = $30,467 Total Interest Cost
$ 30,467 ÷ 1 year = $30,467 Annual Interest Cost
$203,111 ÷ 1 years = $203,111 Annual Principal Payment

Year 6 + Year 7 + Year 8 + Year 9 + Year 10 annual interest costs = $190,684 total annual interest cost for year ten

Year 6 + Year 7 + Year 8 + Year 9 + Year 10 annual principal payments = $630,438 total annual principal payment for year ten

PHASING/HIGH EQUITY

	Unit	Unit Quantity	Unit Income/Cost	Total Income/Cost
SALES REVENUE				
Gross Sales	D.U.	144	$ 85,000	$12,240,000
CONSTRUCTION COSTS				
Site Acquisition	AC	15	21,780	326,700
Buildings	Sq. Ft.	216,000	25.00	5,400,000
Streets and Utilities	%*	6%	8,181,000	490,860
Landscape	%*	6%	8,181,000	490,860
Design Fees	%*	9% +	8,181,000	736,290
Developer's Fees	%*	9% +	8,181,000	736,290
Total				$8,181,000
SOFT COSTS				
Insurance	%*	I%	8,181,000	81,810
Property Taxes	%*	2.31%	8,181,000	188,980
Marketing and Legal Expenses	%**	7%	12,240,000	856,800
Total				$1,127,590
FINANCING COSTS				
Construction Loan	%***	15%	4,090,505	1,366,605
PROFIT/LOSS				$1,564,793 Profit

* Based on Cost of Construction.

** Based on Gross Sales.

*** Based on 80% of Cost of Construction.

\+ Factors of development which are different than the standard method's.

TABLE 4.21: (Phasing/High Equity, Total Revenue/Cost Summary)

PHASING/HIGH EQUITY

	YEAR 1	2	3	4	5	6
SALES REVENUE						
Gross Sales	$ 0	$765,000	$1,530,000	$1,530,000	$2,295,000	$2,295,000
CONSTRUCTION COSTS						
Site Acquisition	326,700	0	0	0	0	0
Building Costs	0	337,500	675,000	675,000	1,012,500	1,012,500
Streets and Utilities	49,086	147,258	147,258	49,086	24,543	24,543
Landscape	0	73,629	49,086	49,086	73,629	122,715
Design Fees	294,516	147,258	22,089	7,363	7,363	147,258
Developer's Fees	125,169	95,718	73,629	58,903	110,444	88,355
Total	$795,471	$801,363	$967,062	$839,438	$1,228,479	$1,395,371
SOFT COSTS						
Insurance	0	5,113	10,226	10,226	15,339	15,339
Property Taxes	0	11,811	23,623	23,623	35,434	35,434
Marketing and Legal Expenses	122,400	163,200	122,400	81,600	40,800	122,400
FINANCING COSTS						
Developer's Investment (.50)	397,736	400,682	483,531	419,719	614,240	697,686
Construction Loan (.50)	397,736	400,682	483,531	419,719	614,240	697,686
Principal Paid	79,547	179,718	340,895	550,755	1,164,995	139,537
Interest Paid	39,099	79,275	129,863	178,179	270,315	68,585
PROFIT/LOSS						
Per Year	($638,782)	($74,799)	$419,462	$265,898	$153,877	$1,216,019
Cummulative	($638,782)	($713,581)	($294,119)	($28,221)	$125,656	$1,341,675

TABLE 4.22: (Phasing/High Equity, Annual/Cumulative Revenue/Cost, Years 1-6)

PHASING/HIGH EQUITY

	YEAR				
	7	8	9	10	Total
SALES REVENUE					
Gross Sales	$1,530,000	$ 765,000	$ 765,000	$ 765,000	$12,240,000
CONSTRUCTION COSTS					
Site Acquisition	0	0	0	0	326,700
Building Costs	675,000	337,500	337,500	337,500	5,400,000
Streets and Utilities	24,543	24,543	0	0	490,860
Landscape	49,086	24,543	24,543	24,543	490,860
Design Fees	73,629	22,089	7,363	7,363	736,290
Developer's Fees	73,629	36,815	36,815	36,815	736,290
Total	$895,887	$445,490	$406,221	$406,221	$8,181,000
SOFT COSTS					
Insurance	10,226	5,113	5,113	5,113	81,810
Property Taxes	23,623	11,811	11,811	11,811	188,981
Marketing and Legal Expenses	81,600	40,800	40,800	40,800	856,800
FINANCING COSTS					
Developer's Investment (.50)	447,944	222,745	203,111	203,111	4,090,505
Construction Loan (.50)	447,944	222,745	203,111	203,111	4,090,505
Principal Paid	251,523	325,771	427,327	630,438	4,090,505
Interest Paid	113,529	136,820	160,217	190,684	1,366,566
PROFIT/LOSS					
Per Year	$601,555	$21,940	($83,379)	($316,957)	$1,564,834
Cummulative	$1,943,230	$1,965,170	$1,881,791	$1,564,834	

TABLE 4.23: (Phasing/High Equity, Annual/Cumulative Revenue/Cost, Years 7-10)

Mixed Use

The mixed use development method is identical to the standard method except for the following assumptions:

Building Costs - Two building types are constructed with the mixed use development method. Forty-four fewer residential units are built with this method, while 48,000 square feet of commercial space is added. The commercial building is constructed at a cost of $35.00 per square foot, $10.00 per square foot more than the cost to construct the residential buildings.

Site Improvements - The cost of streets and utilities increases from 6 percent of the total construction cost to 7 percent due to the large paved parking lot needed to serve the commercial development.

Management Costs - Design fees have been increased to 10 percent of the construction costs up from 8 percent with the standard method. The extra fees are justified because of the necessity to design the commercial development in addition to the residential development, and carefully juxtaposition the two land uses.

Schedule of Construction and Sales - Construction and sale of the commercial portion of the mixed-use development is assumed to occur early in the development process while residential units are built and sold at the same rate as the standard method. Each year is described as follows:

Year	Resid. Units Built/Comm. Space Built	Resid. Units Built %/ Comm. Space Built %	Resid. Units Sold/Comm. Space Sold	Cost of St. & Ut. %	Cost of Land Imp. %	Design Fees %	Devel. Fees %
1	0/0	0/0%	0/0	20	0	60	20
2	14/48,000 s.f.	12.5/100	14/0	70	55	30	40
3	42/0	37.5/0	42/48,000 s.f.	10	20	6	13
4	42/0	37.5/0	42/0	0	20	2	15
5	14/0	12.5/0	14/0	0	5	2	10
	112/48,000 s.f.	100/100	112/48,000 s.f.	100	100	100	100

TABLE 4.24: (Mixed Use Schedule of Construction and Sales)

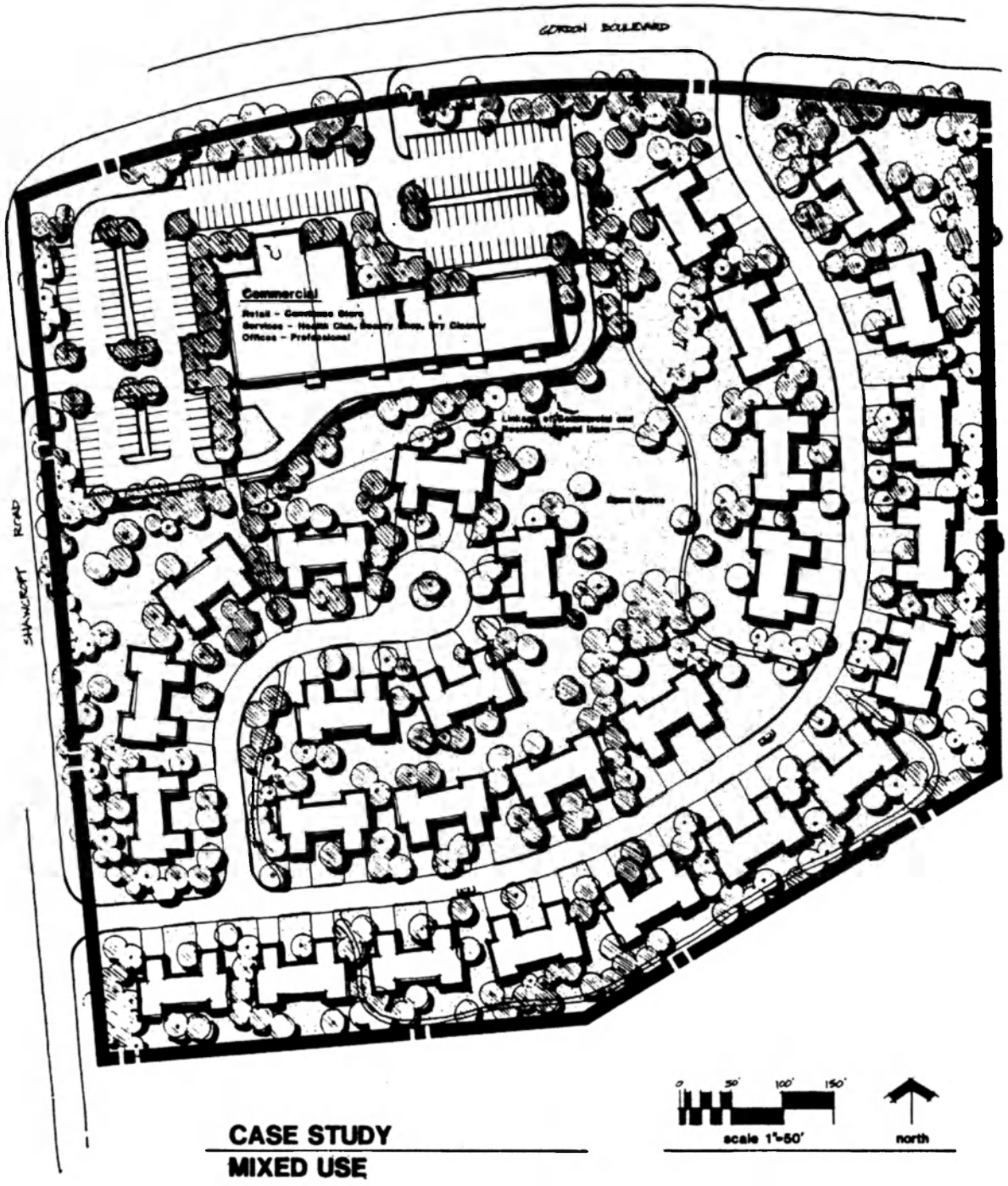

FIGURE 4.3 (Mixed Use Site Plan)

Marketing and Legal Expenses - These costs will increase from 7 percent of the total construction costs to 8 percent because of the extra level of effort required to sale commercial space. This type of space is specialized with a limited number of potential consumers; therefore, marketing is more necessary and costly.

Site Acquisition	$ 326,700
Building Costs	
a) Residential	4,200,000
b) Commercial	1,680,000
Site Improvements	
a) Streets and Utilities	X (.07)
b) Landscape Improvements	+ X (.06)
Management Costs	
a) Design Fees	X (.10)
b) Developer's Fees	+ X (.08)
Total Cost of Construction	X

$6,206,700 + X (.31) = X
$6,206,700 = X (.69)
$8,995,217 = X

Site Acquisition	$ 326,700		$ 326,700
Building Costs			
a) Residential	4,200,000	=	4,200,000
b) Commercial	1,680,000	=	1,680,000
Site Improvements			
a) Streets and Utilities			
X (0.7) = $8,995,217 (.07)		=	629,665
b) Landscape Improvements			
X (0.6) = $8,995,217 (.06)		=	539,713
Management Costs			
a) Design Fees			
X (.10) = $8,995,217 (.10)		=	899,522
b) Developer's Fee			
X (.08) = $8,995,217 (.08)		=	719,617
Total Cost of Construction		=	$8,995,217

Total Cost of Insurance = Total Cost of Construction x 1 percent

$8,995,217 x .01 = $89,952 Total Cost of Insurance

Annual Cost of Insurance = Total Cost of Insurance x percentage of dwelling units completed during the year

Year	Percentage of Dwelling Units and Commercial Space Completed During Year		Total Cost of Insurance		Annual Cost of Insurance
1	0%	X	$89,952	=	0
2	32%	X	89,952	=	$28,785
3	29%	X	89,952	=	$26,086
4	29%	X	89,952	=	26,086
5	10%	X	89,952	=	8,995

TABLE 4.25: (Mixed Use, Cost of Insurance)

Total Property Tax Due = Total Cost of Construction x .33 Assessed Value x .07 Tax Rate

$8,995,217 x .33 x .07 = $207,790 Total Property Tax Due

Annual Property Tax Due = Total Property Tax Due x percentage of dwelling units completed during the year.

Year	Percentage of Dwelling Units Completed During Year		Total Property Tax Due		Annual Property Tax Due
1	0%	X	$207,790	=	0
2	32%	X	207,790	=	$66,493
3	29%	X	207,790	=	$60,259
4	29%	X	207,790	=	60,259
5	10%	X	207,790	=	20,779

TABLE 4.26: (Mixed Use, Property Tax Due)

Total Marketing and Legal Expenses = Total Gross Sales x 8 percent
$14,400 x .08 = $1,152,000 Total Marketing and Legal Expenses
Annual Marketing and Legal Expenses = Total Marketing and Legal Expenses x factor of distribution

The factors of distribution as explained in the Control Study application are variable of X (factor) which can be converted to a percentage figure and used to calculate Annual Marketing and Legal Expense as shown below.

Year	Factor of Distribution		Total Value of Factors		Total Marketing and Legal Expanses		Annual Marketing and Legal Legal Expenses
1	1.5	÷	6.5	x	$1,152,000	=	$265,846
2	2.0	÷	6.5	x	1,152,000	=	354,462
3	1.5	÷	6.5	x	1,152,000	=	265,846
4	1.0	÷	6.5	x	1,152,000	=	177,231
5	.5	÷	6.5	x	1,152,000	=	88,615

TABLE 4.27: (Mixed Use, Marketing and Legal Expenses)

$$\text{Annual Loan Payment or } R = P \frac{(i)\ (1+i)^n}{(1+i)^n - 1}$$

P = principal, money borrowed
i = interest rate, cost of money
n = number of loan payments

Year 1

$$\$909{,}016 \frac{(.15)\ (1+.15)^5}{(1+.15)^5 - 1} = \$271{,}159 \text{ Annual Loan Payment}$$

$ 271,159 x 5 years = $1,355,795 Total Loan Payment
$1,355,795 - $909,016 Principal = $446,779 Total Interest Cost
$ 446,779 ÷ 5 years = $89,356 Annual Interest Cost
$ 909,016 ÷ 5 years = $181,803 Annual Principal Payment

Year 2

$$\$2,800,250 \frac{(.15)\ (1+.15)^4}{(1+.15)^4 - 1} = \$981,022 \text{ Annual Loan Payment}$$

$ 981,022 x 4 years = $3,924,089 Total Loan Payment
$3,924,089 - $2,800,250 Principal = $1,123,839 Total Interest Cost
$1,123,839 ÷ 4 years = $280,960 Annual Interest Cost
$2,800,250 ÷ 4 years = $700,063 Annual Principal Payment
Year 1 + year 2 annual interest costs = $370,316 total annual interest cost for year two
Year 1 + year 2 annual principal payments = $881,866 total annual principal payment for year two

Year 3

$$\$1,526,258 \frac{(.15)\ (1+.15)^3}{(1+.15)^3 - 1} = \$668,342 \text{ Annual Loan Payment}$$

$ 668,258 x 3 years = $2,005,027 Total Loan Payment
$2,005,027 - $1,526,258 Principal = $478,769 Total Interest Cost
$ 478,769 ÷ 3 years = $159,590 Annual Interest Cost
$1,526,258 ÷ 3 years = $508,753 Annual Principal Payment
Year 1 + year 2 + year 3 annual interest costs = $529,906 total annual interest cost for year three
Year 1 + year 2 + year 3 annual principal payments = $1,390,619 total annual principal payment for year three

Year 4

$$\$1,447,100 \frac{(.15)\ (1+.15)^2}{(1+.15)^2 - 1} = \$890,135 \text{ Annual Loan Payment}$$

$ 890,135 x 2 years = $1,780,270 Total Loan Payment
$1,780,270 - $1,447,100 Principal = $333,170 Total Interest Cost
$ 333,170 ÷ 2 years = $166,585 Annual Interest Cost
$1,447,100 ÷ 2 years = $723,550 Annual Principal Payment
Year 1 + year 2 + year 3 + year 4 annual interest costs = $696,491 total annual interest cost for year four
Year 1 + year 2 + year 3 + year 4 annual principal payments = $2,114,169 total annual principal payment for year four

Year 5

$$\$\ 513{,}550\ \frac{(.15)\ (1+.15)^{1}}{(1+.15)^{1}-1} = \$590{,}583 \text{ Annual Loan Payment}$$

$ 590,583 x 1 year = $590,583 Total Loan Payment
$ 590,583 - $513.550 Principal = $77,033 Total Interest Cost
$ 77,033 ÷ 1 year = $77,033 Annual Interest Cost
$ 513,550 ÷ 1 year = $513,550 Annual Principal Payment
Year 1 + year 2 + year 3 + year 4 + year 5 annual interest costs = $773,524 total annual interest cost for year five
Year 1 + year 2 + year 3 + year 4 + year 5 annual principal payments = $2,627,719 total annual principal payment for year five

MIXED USE

	Unit	Unit Quantity	Unit Income/Cost	Total Income/Cost
SALES REVENUE				
Gross Sales	D.U.	112 +	$ 90,000	$10,080,000
	Commercial Unit*	48,000 +	90.00	4,320,000
Total				$14,400,000
CONSTRUCTION COSTS				
Site Acquisition	AC	15	21,780	326,700
Buildings - Res.	Sq. Ft.	168,000 +	25.00	4,200,000
- Comm.		48,000 +	35.00	1,680,000
Streets and Utilities	%**	7% +	8,995,217	629,665
Landscape	%**	6%	8,995,217	539,713
Design Fees	%**	10% +	8,995,217	899,522
Developer's Fees	%**	8%	8,995,217	719,617
Total				$ 8,995,217
SOFT COSTS				
Insurance	%**	1%	8,995,220	89,952
Property Taxes	%**	2.31%	8,995,220	207,790
Marketing and Legal Expenses	%***	8% +	14,400,000	1,152,000
Total				$1,449,742
FINANCING COSTS				
Construction Loan	%****	15%		$2,457,027
PROFIT/LOSS				$1,498,011 Profit

* Square Footage of Commercial Space.

** Based on Cost of Construction.

*** Based on Gross Sales.

**** Based on 80% of Cost of Construction.

\+ Factor of development which are different than the standard methods.

TABLE 4.28 (Mixed Use, Total Revenue/Cost Summary)

MIXED USE

	YEAR 1	2	3	4	5	Total
SALES REVENUE						
Gross Sales	$ 0	$1,260,000	$8,100,000	$3,780,000	$1,260,000	$14,400,000
CONSTRUCTION COSTS						
Site Acquisition	326,700	0	0	0	0	326,700
Building Costs - Residential	0	525,000	1,575,000	1,575,000	525,000	4,200,000
Building Costs - Commercial	0	1,680,000	0	0	0	1,680,000
Streets and Utilities	125,934	440,769	62,967	0	0	629,670
Landscape	0	296,840	107,942	107,942	26,986	539,710
Design Fees	539,712	269,856	53,971	17,990	17,990	899,520
Developer's Fees	143,924	287,848	107,943	107,943	71,962	719,620
Total	$1,136,270	$3,500,313	$1,907,823	$1,808,875	$641,938	$8,995,217
SOFT COSTS						
Insurance	0	28,785	26,086	26,086	8,995	89,952
Property Taxes	0	66,493	50,259	60,259	20,779	207,790
Marketing and Legal Expenses	265,846	354,462	265,846	177,231	88,615	1,152,000
FINANCING COSTS						
Developer's Investment (.20)	227,254	700,063	381,565	361,775	128,388	1,799,044
Construction Loan (.80)	909,016	2,800,250	1,526,258	1,447,100	513,550	7,196,176
Principal Paid	181,803	881,866	1,390,619	2,114,169	2,627,719	7,196,176
Interest Paid	89,538	369,564	529,160	695,866	772,899	2,457,027
PROFIT/LOSS						
Per Year	(764,441)	(1,141,233)	5,446,465	344,614	(2,387,395)	1,498,011
Cumulative	(764,441)	(1,905,674)	3,540,791	3,885,405	1,498,010	

TABLE 4.29: (Mixed Use, Annual/Cumulative Revenue/Cost)

CHAPTER FIVE

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CONCLUSIONS

Comparison of Results

The individual financing and development method's revenues, costs and profits were tabulated and compared in Tables 5.1 and 5.2. The comparative changes in revenues, costs, and profits for the three alternative financing and development methods, in relation to the control study, are given in dollar amounts and as a percentage. Control study figures are given as a total dollar amount. For example, gross sales for the control study were $12,240,000 while the Municipal Financing method produced $720,000 in additional gross sales or a 6 percent increase in gross sales compared to the control study. The Phasing/High Equity method resulted in no change in gross sales and the Mixed Use method created a $2,160,000 increase in gross sales or an 18 percent increase compared to the control study. An analysis of Tables 5.1 and 5.2 indicates the following:

MUNICIPAL FINANCING

The final profit for this financing and development method resulted in an increase in profit of $775,370 or a 65 percent increase. This method generated more total dollars of profit than any of the four methods studied. Its rate of return of 120 percent over a five-year period was also the highest of the four methods. The most significant savings resulted from the special low interest financing provided to the developer by the municipality. The decrease in interest charges from the market rate of 15 percent per year to the special rate of 13 percent per year resulted in a savings of $224,272 or a decrease in finance costs of 11 percent. In addition to finance costs, marketing and legal expenses were reduced significantly ($79,200 or 9 percent) due to the increased desirability of the dwelling units with special neighborhood amenities.

However, some costs were increased. The greatest percentage and dollar amount change in construction costs for this method is a $96,348 or 20 percent increase in landscape costs. This is the greatest cost that any of the four methods incurred for landscaping. Building costs and design fees for this method also increased by significant amounts. Even though building costs increased by a significant $50,000, this represents only a 1 percent increase compared to the control study. In general, additional revenues (6 percent) have been generated due to an increase in sales price justified by the additional amenities built in exchange for cost saving, low interest rate financing provided by the municipality.

PHASING/HIGH EQUITY

The Phasing/High Equity method generated $372,038 more in profit than the control method, or a 31 percent increase in profit. This is the second highest profit of the four methods, though it is only marginally greater than the third highest profit generated by the mixed use method. More importantly the rate of return on the developer's investment is the lowest of all four methods at 63 percent over the project's 10-year life, or an annual return on investment of approximately 5 percent. This method's low rate of return on investment does not eliminate it from consideration as a financially feasible method. This method results in the greatest savings of finance costs of the four methods studied. Financing costs were reduced by 31 percent or $606,822 compared to the control method. This savings was created by the developer investing more of his own capital and borrowing fewer funds. The importance of this savings is directly related to the cost to borrow money. If money should become less expensive to borrow due to money market conditions, this factor becomes less important in its effect on total profits.

The Phasing/High Equity method is principally a financing cost cutting method which does not generate additional gross revenues. Gross revenues remained the same while financing costs were reduced,

but significant additional costs for design fees and developer fees were incurred, with each of these costs increasing by $99,990 or 16 percent in comparison with the control study. The increase in costs for developer fees could be perceived as a benefit to the developer. This increase is caused by the developer's services being required for ten years instead of five years due to the extended phasing process. This extension of the development process could be used by the developer to provide a more consistant, long-term source of income for himself and his staff. Notice on Graphs 5.1 and 5.2 that this method has the least dramatic change in annual and cumulative profits/losses from year-to-year compared to the other three mtehods. This benefit of stable income could be even more beneficial if the developer was also the designer of the project.

MIXED USE

This method created the greatest amount of total revenue compared to the other financing and development methods. Gross sales was increased by $2,160,000. This represents an 18 percent increase compared to the control method. The increased revenue was primarily provided by the commercial portion of the project generating more income than the same area would have generated if it were residential. In addition, the remaining residential portion of the mixed use development generated $5,000 more in revenue per unit than the standard method because of an increase in desirability.

The large increase in gross sales generated by the Mixed Use method is balanced by large overall increases in construction and soft costs. In all categories except landscape costs and developers fees this method has the greatest costs compared to the other financing and development methods studied. The three most significant increases are related to streets and utilities ($152,445 or a 32 percent increase), design fees ($263,220 or a 41 percent increase), and marketing and

	Control Study	Comparative Change in Income/ Cost		
	Total Income/Cost	Municipal Financing	Phasing/ High Equity	Mixed Use
SALES REVENUE				
Gross Sales	$12,240	+$720,000 (6%)	no change	+$2,160,000 (18%)
CONSTRUCTION COSTS				
Site Acquisition	326,700	no change	no change	no change
Buildings	5,400,00	+50,000 (1%)	no change	+480,000 (9%)
Streets & Utilities	477,225	+14,409 (3%)	+13,635 (3%)	+152,445 (32%)
Landscape	477,225	+96,348 (20%)	+13,635 (3%)	+62,485 (13%)
Design Fees	636,300	+60,182 (9%)	+99,990 (16%)	+263,220 (41%)
Developer's Fees	636,300	+19,211 (3%)	+99,990 (16%)	+83,320 (13%)
SOFT COSTS				
Insurance	79,538	+2,400 (3%)	+2,272 (3%)	+10,414 (13%)
Property Taxes	183,730	+5,549 (3%)	+5,250 (3%)	+24,060 (13%)
Marketing and Legal Expenses	856,800	-79,200 (9%)	no change	+295,200 (34%)
FINANCING COSTS	1,973,427	-224,272 (11%)	-606,822 (31%)	+483,600 (25%)
PROFIT/LOSS	1,192,755	+775,370 (65%)	+$372,038 (31%)	+$305,261 (26%)

TABLE 5.1: (Comparative Change in Income/Cost)

	Control Study	Municipal Financing	Phasing/ High Equity	Mixed Use
Profit/Loss after project completion (comparative change in dollars and as a percentage)	$1,192,755	$1,968,124 +775,370 (65%)	$1,564,793 +372,038 (31%)	$1,498,011 305,261 (26%)
Capital Invested by Developer	$1,590,750	$1,638,781 +48,031 (3%)	$4,090,505 +2,499,755 (157%)	$1,799,044 +208,294 (13%)
Total Rate of Return on Developer's Investment (accumulated over entire project life, 5 or 10 years)	75%	120%	63%	83%
Annual Rate of Return on Developer's Investment (total rate of return on an annual basis for the life of the project)	12%	17%	5%	13%

TABLE 5.2: (Comparative Profit/Loss and Rate of Return)

legal expenses ($295,200 or a 34 percent increase). The increase in construction costs, not soft costs which we have assumed are not financed, results in a similar increase in financing costs of $483,600 or 25 percent. This is the highest cost for financing of the four methods.

In spite of the high construction, soft and financing costs the Mixed Use method generates an additional profit of $305,261 or 26 percent greater than the control study. Even though this is only the third greatest dollar amount of profit generated, compared to the other financing and development methods studied, the return on investment is significant. The total rate of return on developer's investment of 83 percent over five years or approximately 13 percent per year is second only to the Municipal Financing method. The profit may even be greater or the method more beneficial if the developer has in-house design and marketing capabilities and is familiar with this development type.

Analysis of Individual Results

MUNICIPAL FINANCING

This method generates additional income due to increased desirability. This desirability, or responsiveness to or creation of market demand may be overstated in this study, and is a critical assumption in predicting the profitability of this method. We can somewhat confidently predict the increase in construction costs and soft costs to be close to $248,101 and that financing costs will be reduced by approximately $224,272, as indicated by this study. However, the increase in sales price of $5,000 per dwelling unit and a decrease in marketing and legal expenses of $79,200 or 9 percent is more speculative. These assumptions are based on the results of previous similar, not identical, developments. If these assumptions based on available predictive model are inaccurate, this development

method could be much less profitable than the 17 percent per year return on investment predicted. It may be reasonable to expect that the sales price would not increase, marketing costs would not decrease, and that the development time table for selling all units would be reduced from five years to three or four years. This would result in lower financing costs and possibly lower developer fees but would not result in large amounts of additional income being generated as previously predicted by this study. Due to the critical nature of key assumptions which we cannot confidently substantiate this financing and development method involves a high degree of risk.

There are other potential problems or predictable consequences associated with this method. Working with a municipality can be difficult for a developer. The cooperative relationship assumed in this study involves a great deal of time and effort by the developer, and willing government officials. Without the proper political or socioeconomic conditions, the developer cannot force the municipality to cooperate. Even with a local governmental body willing to work with the developer, time delays due to complicated negotiations, review and approval processes, can jeopardize the projects feasibility. Time delays may cause unacceptable increases in the cost to hold the development property, or may result in the developer missing an opportune market condition. In some cases, this method may not be legal. Even though the Municipal Financing method resulted in the greatest return on investment, it is not necessarily the best financing and development method. Some circumstances may help offset the negative aspects of risk, time delays, and difficult governmental cooperation. Municipal Financing becomes a more viable alternative when other methods of financing are difficult to obtain due to an unusual development site or land use. Sometimes developers cannot obtain financing for projects in especially poor, urban areas without local municipal support and cooperation. The developer may find it advantageous to try the Municipal Financing method in communities which need community amenities or when the local market demands

certain neighborhood/community amenities. The key to the success of the Municipal Financing method is the ability to maximize the marketing benefits of concessions given to the city in return for low cost financing.

PHASING/HIGH EQUITY

No additional income is generated with this method. It is a cost control approach. Finance costs are reduced by 37 percent because of the larger amounts of money invested by the developer instead of borrowing money to invest in the development. The burden on the developer to provide 50 percent of the required investment, instead of the standard method's 20 percent, is not as severe as might initially be assumed. During years one through five, the developer's investment with the Phasing/High Equity method is only slightly greater than the investment required for the other methods. The developer invests slightly more of his own funds in comparison with the other methods while only half of the improvements are built. During this initial five-year period, gross sales are significantly less since only half of the income producing improvements have been built. This method assumes no change in total gross sales and spreads those sales over a ten-year period instead of the standard method's five years. The critical issue with the Phasing/High Equity method is whether the slower sales rate can be justified by the lower financing costs. The total profits are high but the rate of return on investment is at an unacceptable level. With an annual rate of return of only 5 percent, the developer is not generating enough profit to overcome opportunity costs. Opportunity costs are measured in terms of the value of the lost opportunity to pursue the best alternative investment with the same money and effort. If the developer, with little effort, had invested his $4,090,505 in a guaranteed certificate of deposit with a rate of return of 8 to 10 percent, he would have made more money. The Phasing/High Equity rate of return on investment does not justify the use of this method as applied in this study.

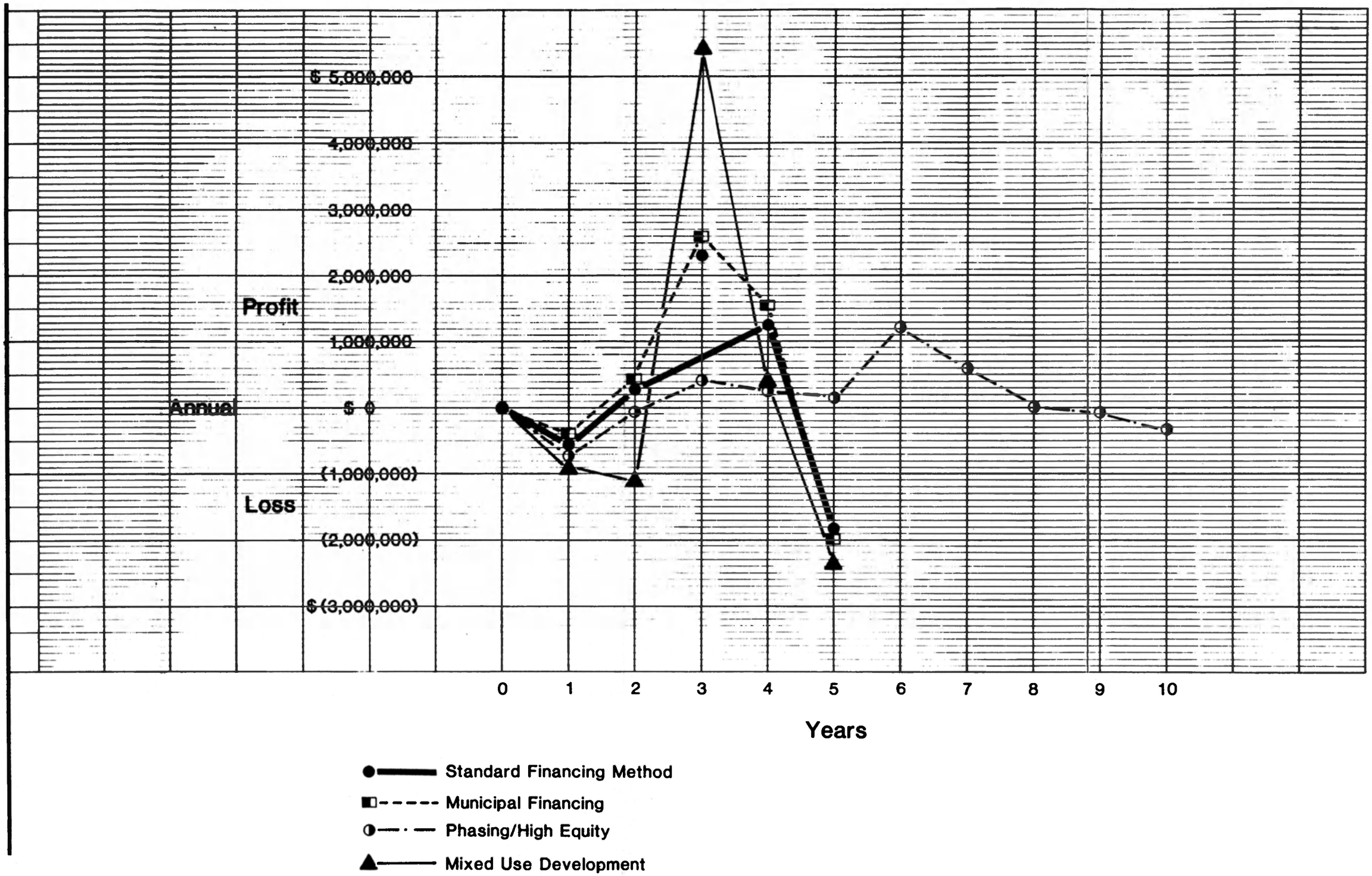
Another problem with this method is the developer's increased personal liability. The developer with substantially more of his personal funds invested in the development will suffer a greater loss if the development is not profitable or if he is unable to complete the planned improvements. The Phasing/High Equity financing and development process can be difficult for the developer to complete. In this study, the developer must wait five years until a cumulative profit is realized. A reliable and patient financing source is needed if the developer wants to complete his ten-year project. In addition to a lower return on investment and greater personal financial risk the Phasing/High Equity method does not take advantage of leverage. Leverage allows the developer to use other investment sources to produce income which provides a higher rate of return on his personal investment. This process takes advantage of high economic growth and inflation, and assumes a continually improving economy. However, when the economy is stable or in a recession, leverage can place the developer at great risk. This risk is the result of the developer being committed to large loans (and loan payments) which he has used to invest in his project. But his project is not producing more income than the annual cost to borrow the investment. In this regard, the Phasing/High Equity method could be considered advantageous during a stable or shrinking economy.

In general, this method is safer and more consistent. Profits and losses are more evenly distributed over the development's ten-year life. This consistency reduces difficulties associated with highly progressive income tax rates. With profits more evenly distributed over a ten-year period, the developer pays taxes each year at a lower rate. The Phasing/High Equity method is also safer because the product can be changed during the ten-year development period. If market conditions change, or if certain features built during the early phases are popular or undesirable, then appropriate modifications can be made for later phases of the development. This method allows the developer to test and respond to consumer

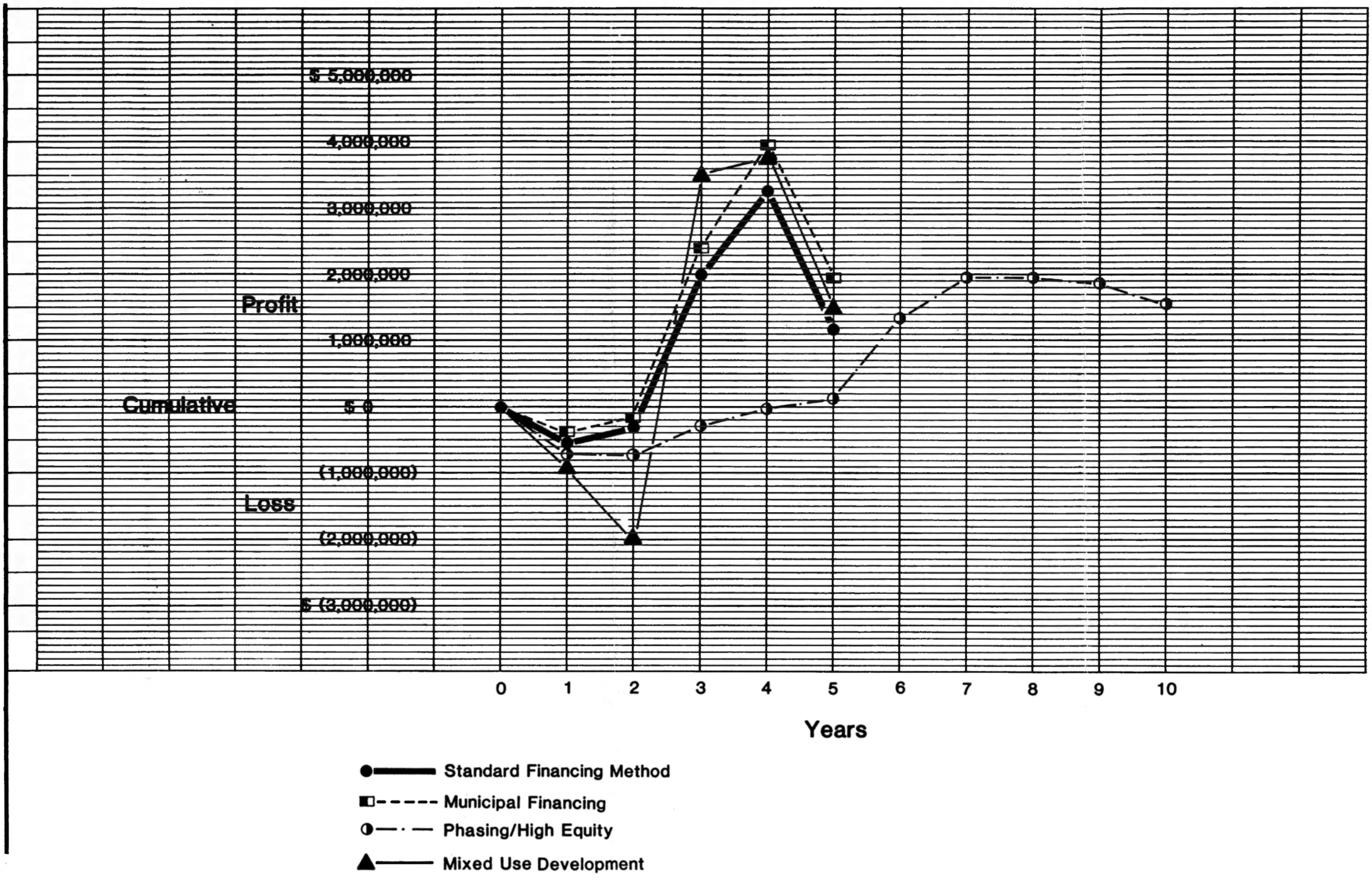
preferences. In some instances the housing market may be so weak in general, that there is only enough demand to justify the project if it is slowly phased in over a ten-year period. The slow, phased construction of improvements may also help in community and governmental acceptance of the development. Phasing can reduce concerns over inadequate existing infrastructure capacity, future increases in traffic volumes and the general image projected by a new and unfamiliar development. Probably the most common reason why this method is used is because it is the only way that the developer can finance his development. Due to the developer's inexperience resulting in investors being reluctant to commit their funds or because of tight money market conditions, the developer may be forced to accept the Phasing/High Equity method or seek other ways to invest his skills and capital in order to generate income.

MIXED USE

The Mixed Use method generates greater income due to an increase in desirability and a high profit per acre realized from commercial instead of residential development. The commercial portion of the mixed use development generates a greater dollar amount of profit and a higher return on investment than if the same area were developed with a residential land use. However, the developer is subject to greater risks while generating the increase in profits. This method produces much higher gross sales by constructing more costly improvements. As revenues and costs increase, the dollar value at risk also increases. If the more costly improvements are built but the improvements do not produce anticipated revenues, the potential financial loss is greater. It can also be difficult for the other developer to obtain governmental approaches for a Mixed Use development. The time delays and extra costs for designers and legal representatives can reduce the developer's willingness to use the method. However, this method does diversify the developer's risk between two land uses.



GRAPH 5.1 (Annual Development Profit/Loss)



GRAPH 5.2 (Cumulative Development Profit/Loss)

Impact Upon Designer and Developer

Financing has been one of the most influential variables affecting the profitability of housing development. Various development methods have been created to reduce some of the costly characteristics of high interest rates. These financing and development methods have traditionally been manipulated and chooser by the developer separate from the design process. There is a need for landscape architects to acquire and development methods which have traditionally been manipulated and chooser by the developer separate from the design process. There is a need for landscape architects to acquire training so that they can help the developer/client to more effectively integrate the positive aspects of financing and development methods with land use planning and site design. This study helps the landscape architects to think through the development process and understand how decisions effecting phasing, product, and approach for governmental approvals might be made by the developer/client based on financial considerations.

The landscape architect, in the role of the land use planner and site designer can maximize the benefits of each financing and development method by considering these aspects of the development process as additional design opportunities and constraints. A better product can be designed by manipulating site factors in regard to financing issues. For example, the Municipal Financing method analyzed in this study provided a community building, additional walkways and landscaping in order to obtain special low cost financing. If the landscape architect is involved in the creation and negotiation of the municipal finance method, he can propose municipal amenities which are appropriate for the plan and can more fully incorporate the special amenities into the site design. The Phasing/High Equity method can provide more profit for the developer if the landscape architect can minimize the negative effects of phasing. The designer can have the ability to design a site plan which responds to the need to generate profits early the extended

development period, the importance of maintaining low unit costs despite phasing and the need to provide continual market visibility. The Mixed Use method requires special coordination by the landscape architect of differing and sometimes conflicting land uses. The site designer familiar with the development process can work with the developer to assure that the land uses respond to the market need, can be mutually beneficial and will be acceptable to the community residents and governmental authorities.

The coordinated effort by the landscape architect and the developer is especially responsive to the developer's prime motive for development, the creation of profit with an acceptable rate of return on his investment. The landscape architect is typically forced to respond to this motive, without the opportunity for meaningful dialogue with the developer, by reducing the initial implementation costs of the proposed improvements. With a knowledge of finance and development methods, the landscape architect can respond to the developer's concerns and suggest alternative means to maximize profits. In addition to responding to the developer's basic development motive, the landscape architect's knowledge of the financing and development process represents an extension of his expertise. This expansion of his expertise provides him with an increased scope of services with which he can produce an income. His additional knowledge creates an opportunity to become involved with clients early in the development process. The landscape architect's exposure and visibility early in the development process increases the probability that he will acquire design work later in the development process.

This study does not provide the developer or landscape architect with a definitive judgement as to the feasibility of the individual financing and development methods. Each area of the country and each developer must deal with a separate set of factors which vary even further from project to project. The feasibility analysis technique is a method to quantify assumptions that ultimately effect the

projects profitability. These assumptions are based on factors which are constantly changing due to socioeconomic conditions and differing project site conditions. The case study indicated the Mixed Use method was moderately feasible. However, if demand for commercial units was higher than anticipated, and a higher sales price received, due to local market conditions, the Mixed Use method might have been the most profitable alternative method. There are, however, too many unpredictable variations to generate absolute conclusions.

Further Study

This study researched various sources to accumulate a data base of standard and alternative financing and development methods and their related revenue and costs. There was little information to be found in existing literature. Most of the information concerning various processes, costs, and revenues was found in building industry periodicals and from Urban Land Institute publications. The lack of literature resulted in this study relying on information gained from interviews with developers, municipal planning officials, real estates brokers, and university professors in the disciplines of landscape architecture, planning, construction management, business mangement, and real estate. In addition, information was gained from landscape architects, planners, and clients while employed by Michel L. Ives and Associates and Harland Bartholomew & Associates.

The standard financing and development method identified by this study should not be considered a standard method for all development projects. Research indicated that there is no standard method or approach, but rather an infinite number of methods, combinations and variations of methods which are uniquely applied to each development. The four financing and development methods analyzed in this study represent only a small portion of the numerous alternative development methods. These alternative methods include but are not limited to the following:

Land Purchase	- The developer pays for the option to purchase smaller parcels of a larger site on an as needed basis.
	- The developer leases the land to purchasers of homes to reduce consumer costs.
	- Property is obtained at no cost to the developer in return for sharing profits from development with the land owner.
	- The developer purchases incremental parcels of land over an extended time period (10 to 20 years) at a fixed cost per acre to reduce early land holding costs while protecting against inflation and land speculation due to development.
Governmental Cooperation	- The developer acquires local governmental approvals with performance zoning or a bonus point system where variances are approved by the local government in return for the provision of certain amenities or compliance with special design guidelines.
	- Through a tax increment financing method the developer's increased property tax due to improvements is deferred, in return for the provision of certain amenities or the use of a design approach beneficial to the community.
Product Type	- Dwelling units are built and marketed as apartments. The developer takes advantage of low maintenance costs and depreciation/tax benefits and then converts and sells the units as condominium/townhouses.
Sales	- Dwelling units are pre-sold early in the development process to produce a more consistant profit/loss per year resulting in tax benefits.
	- Revenues are deferred over an extended time period (10 to 20 years) to reduce the effect of the progressive federal income tax on profits.
Design and Developer Fees	- Payment of early design services and developer fees are deferred to improve cash flow and receive tax benefits, by including these professionals as development business partners/associates who will receive payment in the form of profits when and if they are generated by the development.

Investors - Investors in need of business losses for tax purposes provide capital during early phases of the development in return for tax benefits then receives profits from later stages of development over an extended time period.

This is just a sampling of the alternative methods available to the developer and landscape architect. The creation of new financing and development methods is limited only by the imagination of the developer and designer, the legal restrictions of the local, state, and federal governments, and the willingness of the investors or ultimate consumers. A mixture of several accepted methods can produce a unique approach which may serve a current need. Two methods analyzed in this study may be more profitable if they were combined. The Mixed Use method's high revenues could perhaps be combined with the Phasing/High Equity's low financing costs to produce greater over-all profits.

The tremendous variety of financing and development methods emphasizes the need for computer programs to help the developer and landscape architect manage the large amounts of information. Through the use of available computer hardware and software, the designer and developer can study the effects of numerous methods and associated variables without time-consuming calculations.

This study also indicates the difficulty associated with attempting to determine a development project's feasibility using only financial data. Even with the somewhat lengthy set of calculations used in this study, it was not possible to include important factors like market demand, and zoning and subdivision regulations. These additional factors would need to be considered in order to arrive at a meaningful decision. In addition to market demand, zoning, and subdivision regulations, each project has a unique set of variables due to the project site. The site's combination of size, configuration, topography, vegetation, surface drainage, soils, adjacent land uses, views, and spatial characteristics uniquely affect the financing and development processes of each project. Real estate

development has the distinction of producing a service and product which cannot be standardized, in spite of continuing attempts, due to the multiple variables mentioned above. Therefore, conclusions concerning the feasibility of a development process or financing technique must be limited to the specific project. However, with the help of the computer the following factors could be included in a feasibility study:

Market Demand	-	customer price perceptions, product preferences, disposable income levels
Zoning and Subdivision Regulations	-	time to receive approvals, necessary concessions
Site Conditions	-	size, configuration, topography, vegetation, surface drainage, soils, adjacent land uses, views, spatial characteristics
Construction Costs	-	site acquisition, building costs, site improvements, management costs
Soft Costs	-	insurance premiums, property taxes, marketing, and legal expenses
Financing Costs	-	construction loan
Schedule of Construction and Sales	-	available labor force and materials, customer demand

In addition, intangible or subjective factors could be included such as perception of risk, and contractor's image and goodwill. If these numerous variables are included in a computer program, the accuracy of the feasibility analysis can be increased without the burden of extra time consuming calculations. Once the analysis is programmed, the designer and developer only have to enter the pertinent data to determine the project's feasibility. Each one of these variables can then be easily manipulated independently and in combination to study the various consequences. The reliability of the analysis would not be limited by the quantity of variables studied but rather by the quality of the base data. A computer application could

be helpful from this standpoint as well since the designer and developer can collect and continually update data from previous projects and other information sources.

Further studies might investigate the effect that interest rates would have on the four methods included in this study. Assumptions could be verified or disproven by manipulating the one variable of interest rate. It can be speculated that if interest rates increased dramatically, the following would occur:

Standard Method - With the second highest financing costs of the four methods, the standard method could prove to be infeasible. Financing costs are 17 percent of total costs incurred during the development process. With higher interest rates, the developer would be motivated to seek alternative methods to help control the loss of profits.

Municipal Financing - This method would become more frequently used during an economic period with high interest rates. It was assumed in this study that this method would reduce the annual interest rate of borrowed money from 15 percent to 13 percent. This resulted in a savings of $224,272.00 or an 11 percent reduction in financing costs. The Municipal Financing method's financing costs are only 16 percent of total costs incurred, compared to 17 percent for the Standard method. As financing costs increase, this savings represents a greater savings in relation to other costs and revenues. If for instance interest rates increase to 20 percent per year, financing costs may represent 23 to 24 percent of total costs incurred during the development process, or a dollar value of about $2,530,000.00 if applied to the Municipal Financing method. This figure compared to the financing costs calculated in this study of $1,749,155.00 shows how changes in interest rates have a disproportionate effect on costs or potential savings of alternative methods.

Phasing/High Equity - This method could also become a preferable alternative to the Standard method if interest rates increased sharply. The acceptance of this method would depend on other economic conditions. If the interest rate in regard to the cost to borrow money increased while the interest rate in regard to alternative means of investment (opportunity costs) do not increase proportionately then this method becomes a profitable alternative. This condition could occur in a shrinking, recessionary economy. If interest rates are high due to inflationary pressures then this method would be a poor choice financially. The developer would save some financing costs but would forego even greater opportunities to generate income through alternative means of investment. The developer would create a

larger profit if he borrowed 90 or 100 percent of the money needed for the development and therefore take advantage of the benefits of leverage during a growing economy. He could at the same time take his money that he would have invested in the development, and invest that money in tax shelters. Thus, he would reduce the negative affect that inflation has on the progressive income tax rate.

Mixed Use - This method does not provide for a savings in financing costs. It creates the highest construction costs. For this method, financing costs in relation to total profits are a ratio of 1.64:1, compared to .89:1 for the Phasing/High Equity method. As interest rates rise, this method would become increasingly unprofitable unless it was combined with other financing and development methods which would reduce financing costs. In general, development projects which require large amounts of financing become financially infeasible when interest rates rise.

If interest rates were to decrease sharply, the opposite financial effects would occur. The burden of municipal financing would be greater than the anticipated financing benefits and developers would seek other methods. The standard method may become the preferred method due to its general acceptance by investors and municipalities, without the potential delays associated with other methods. The most critical factor during times of low interest rates is to acquire financing as quickly as possible for as many development projects as possible. The developer wants to decrease the time it takes to design, construct, and sale his development so that he can generate the maximum amount of income while interest rates are low. The Phasing/High Equity method obviously does not respond to this need. However, te Mixed Use method generates the highest amount of revenues in the shortest time frame of the four methods (assuming governmental approvals and design services are not lengthy) and becomes the best way to produce a profit during times of low interest rates.

REFERENCES

Barkyoumb, Dale. Manhattan Federal Savings and Loan. Manhattan, Kansas. President.

Blanton, James. Manhattan, Kansas. Real Estate Broker

Brigham, (1971). Financial Management Theory and Practice, Cambridge: Harvard University Press.

Brokinecy, Philip. Manhattan, Kansas. Real Estate Investor.

Burchell, Roberw W. (1978). The Fiscal Impact Handbook. New Brunswick: Center for Urban Policy Research.

Cooper, James R. and Gunterman, Karl L. (1974). Real Estate and Urban Land Analysis. Lexington: Lexington Books.

Creative Financing and Development Projects. (1981). American Institute of Architects.

Duchek, Robert. Harland Bartholomew & Associates, Inc., Chicago, Illinois. Planning Department Head.

Hanines, Robert. Home Federal Savings and Loan. Manhattan, Kansas. President.

Hemphill, James. C. A. Hemphill and Associates, Inc. President.

Kendig, Lane. (1980) Performance Zoning. Washington, D.C.: Planners Press.

Kudulis. Ken. Chicago. Illinois. Real Estate Broker.

Lieberman, David M. (1974). Your Introduction to Real Estate. New York: Van Nostrand Reinhold Co.

Martin, Frank. C. A. Hemphill and Associates, Inc., Project Manager.

Messner, Stephen D. (1977). Analyzing Real Estate Opportunities; Market and Feasibility Studies. Chicago: National Marketing Institute of the National Association of Realtors.

Muller, Dexter. Harland Bartholomew & Associates, Inc., Memphis, Tennessee. Senior Planner.

Nelson, Elenor. (1982). Help from Winfield Might Lure Developer. Chicago: Tribune.

Richards, Lyle. Kansas State University. Manhattan, Kansas. Finance Department Head.

Sloan, Harold S. (1963). Dictionary of Economics. New York: Barnes and Noble, Inc.

Thompson, Rosylee. Manhattan, Kansas. Developer.

Urban Land Institute. (1980). Midland, Texas; An Evaluation of Residential, Commercial, and Industrial Development Potentials and Strategies.

Urban Land Institue. (1976). Mixed Use Developments: New Ways of Land Use.

Urban Land Institute. (Technical Bulletin #67, 1972). Optimizing Development Profits in Large Scale Real Estate Projects.

Urban Land Institute. Residential Development Handbook.

Wiley. Real Estate Investment: Analysis and Strategy.

Worthington, Roy. Kansas State University. Manhattan, Kansas. Instructor of Real Estate.

THE EFFECTS OF FINANCING AND DEVELOPMENT METHODS ON THE DESIGN OF MODERATE DENSITY HOUSING

by

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AN ABSTRACT OF A MASTER'S THESIS

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ABSTRACT

Financing has been one of the most influential variables affecting the profitability of housing development. Various development methods have been created to reduce some of the costly characteristics of high interest rates. These financing and development methods have traditionally been manipulated and chosen by the developer, separate from the design process. There is a need for the landscape architect to acquire training so that he can help the developer to more effectively integrate the positive aspects of financing and development methods with land use planning and site design.

This study is comparative analysis of four financing and development methods applied to a small, moderate density townhouse project. The project is based on an actual development with the standard method's site design, general costs and revenues provided by a Chicago developer. The development is used as a standard to compare and evaluate the three additional financing and development method alternatives: municipal financing, phasing/high equity, and mixed use. These methods were chosen due to their current or potential use by the housing industry, and their potential affect on the role and effectiveness of the landscape architect. Revisions were made to the standard development site design for each alternative method, and applicable costs and revenues were estimated with input from a variety of developers, landscape architects, planners, engineers and available literature.

Following a series of calculations, the financial results of the four financing and development methods were identified and compared. It was found that due to the variety of factors affecting the development it is not possible to categorically judge the feasibility of individual financing and development methods. The case study application of the four financing and development methods resulted in the municipal financing method generating the greatest profit as a

percentage of capital invested. In summary, the landscape architect in the role of land use planner and site designer can maximize the benefits of each financing and development method, and has the opportunity and responsibility to broaden his professional expertise into the area of financing and development methods to assist the developer in profitably providing quality housing.