Alternatives for the Planned Unit Development: Foundations for a Sustainable Future

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Bachelor of Urban Planning and Development

by

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My colleagues in the B.U.P.D. Class of '91
This thesis is dedicated to

Janet K. Kingsbury, 1939-1991,
my mother, friend and teacher of the most important things -- life, laughter and love.
"Man and nature belong together... in their created glory, in their tragedy and in their salvation."

-anonymous

"We must all see ourselves as part of this earth, no: as an enemy from the outside who tries to impose his will on it. Being a living part of the earth, we cannot harm any part of her without hurting ourselves."

-Lame Deer, Native American activist

"I cannot say whether things will get better if we change; what I can say is they must change if they are to get better."

-G.C. Lichtenberge

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# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>1</td>
</tr>
<tr>
<td>CHAPTER ONE...INTRODUCTION</td>
<td>2</td>
</tr>
<tr>
<td>CHAPTER TWO...METHODOLOGY</td>
<td>10</td>
</tr>
<tr>
<td>CHAPTER THREE...LITERATURE REVIEW</td>
<td>13</td>
</tr>
<tr>
<td>CHAPTER FOUR...PROPOSALS</td>
<td>23</td>
</tr>
<tr>
<td>CHAPTER FIVE...SUMMARY AND CONCLUSION</td>
<td>40</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>43</td>
</tr>
<tr>
<td>REFERENCES CITED</td>
<td>46</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>49</td>
</tr>
<tr>
<td>A. Vicinity Map</td>
<td></td>
</tr>
<tr>
<td>B. Hamilton Proper -- Development Plan</td>
<td></td>
</tr>
<tr>
<td>C. Hamilton Proper -- Phase One</td>
<td></td>
</tr>
<tr>
<td>D. Phase One -- homesite information</td>
<td></td>
</tr>
<tr>
<td>E. Marketing Prospectus</td>
<td></td>
</tr>
<tr>
<td>F. Villa D'Este at Sweetwater</td>
<td></td>
</tr>
<tr>
<td>G. Whitman Pond</td>
<td></td>
</tr>
</tbody>
</table>
A B S T R A C T

This thesis is a presentation of alternatives for sustainable land development in Hamilton Proper, a planned unit development currently being built in Hamilton County Indiana by Mansur Development Corporation. The basic assumption in this study is that developments targeted at the upper income market can incorporate sustainable development techniques while maintaining profit potential characteristic of developments that do not include sustainable techniques. The research and case studies examined in this project illustrate that sustainable developments are energy efficient and environmentally sensitive when compared to more traditional developments. Also, sustainable developments can be cost effective and marketable.

After considering the developer's goals for the development and several issues, the project focused on two -- land use and density. Particular emphasis is on the viability and cost effectiveness of the techniques used to address the issues because providing realistic alternatives is an important aspect of this project. The result is four proposals that are recommended to achieve a more sustainable development. One, develop "pockets" within Hamilton Proper that combine residential, retail, office, recreation and open space land uses. Two, link pockets together by transportation systems with an emphasis on non-vehicular systems. Three, develop higher density housing types throughout the project while preserving the image of prestige. Four, increase density by utilizing different site planning techniques such as clustering and zero lot line.

What can be gleaned from this study is that planned unit developments can incorporate alternative techniques that have a significant effect on energy consumption and less impact on the environment while remaining cost effective and marketable.
CHAPTER ONE

INTRODUCTION

PROBLEM STATEMENT

The goal of this thesis project is to present proposals and recommendations for implementing sustainable alternatives in planned unit developments. The objectives are to: 1) determine which alternatives for sustainable land development are the most successful in terms of being viable and cost effective; and 2) incorporate those successful alternatives into a planned unit development in Hamilton County, Indiana.

DEFINITIONS

For the purposes of this thesis, several words and phrases are defined that are critical for clarity and understanding. Sustainable is defined as a belief or action that is based on the idea that the earth has a limited supply of non-renewable resources and that humans are a part of nature and not in any way superior to it (Chiras 1988, p. 433). Frontier mentality, in contrast, is defined by Chiras (1988, p. 435) as the belief that the earth has a virtually unlimited supply of resources, humans are apart from nature rather than a part of it, and nature is something to compete with and dominate. Coomer (1981, p. 1) adds the idea that "...the sustainable society recognizes that there is one primary environment -- the physical environment -- within which all other environments function." The political, economic, technological and social environments are a part of, and act as a result of, the physical environment. Sustainable techniques are methods of planning, constructing and implementing real estate developments that exemplify this definition of sustainable. In this project, the constraints for selecting certain techniques for the sustainable development of land are
that they be both sustainable (i.e., they conform to the above definition) and viable (i.e., have been, or have the potential for being, used in an actual project).

Development is defined as the subdivision of land and the construction of improvements on the land such as roads, utilities and buildings (Floyd 1990, p. 12). It includes residential, commercial or industrial uses or a combination thereof. As Vieira (1990, p.10) defines it, sustainable development is a concept or attitude that considers a site's natural features, such as land, water and energy resources, as integral elements of the development design. Instead of changing the landscape to fit the development, a sustainable design uses the natural features of the site wherever possible as a means for maintaining or sustaining the site.

Planned unit development (PUD) is a large development, often combining residential, commercial, recreational and industrial uses to serve the residential population's basic needs, where the objective is the most efficient and flexible use of the land (Farmer and Gibb 1979, p.253). The project is guided by a master plan for the entire project that must, as a whole, be approved by the local authorities. The American Society of Planning Officials defines it as "...a land development project comprehensively planned as an entity via a unitary site plan which permits flexibility in building siting, mixtures of housing types and land uses, usable open spaces, and the preservation of significant natural features (Tomioka 1984, p. 100)." It is a progressive zoning classification that involves a compromise between the public and private sector. For example, a developer can build at higher densities in exchange for including in the development improvements for the public good such as green space or common areas.

**HAMILTON PROPER**

This thesis project will utilize the site of "Hamilton Proper" in a comparison of sustainable and traditional development approaches. Hamilton Proper is zoned
planned unit development (PUD) and is located in southeastern Hamilton County, northeast of Indianapolis (see appendix A). It is a 1,300 acre master-planned community with proposed residential and commercial land uses, two golf courses, a diverse landscape and environmentally sensitive areas. The zoning will allow a maximum of 3,700 housing units, but currently the development plans call for only 2,000 units. The area is bordered by 116th Street on the north, Brooks School Road on the east, 106th Street and Fall Creek Road on the south and Cumberland Road on the west (see appendix B). The development is divided by Hoosier Road which runs north -- south. The area to the west is Hamilton Proper West and the area to the east is Hamilton Proper East. Hamilton Proper East is the first to be developed and will contain an 18-hole golf course and country club and will have homesites suitable for homes ranging from $200,000 to $1,000,000.

According to the marketing prospectus, the Hamilton Proper master plan includes:

- Two golf courses -- one semi-private and one exclusive
- Community-oriented swim and racquet club
- Community service sites for schools and churches
- Protected wetlands (twenty-four acres) and natural areas
- A neighborhood commercial center
- Community parks and recreation areas
- Jogging and fitness trails

The alternatives presented in this thesis will utilize a portion of that PUD site which has been identified as phase one (see appendix C). Phase one, currently in the beginning stages of construction will include 162 homesites in five distinctive neighborhoods, the exclusive golf course/country club and recreational facilities and the Hamilton Proper Marketing Center. The homesites in this phase range from $39,000 to $250,000 and vary from .4 to 1.5 acre lots (see appendix D). As originally proposed, this phase has a density of 1.24 units per acre.
PROJECT SCOPE

The whole area of sustainability is very broad and means different things in different contexts. Sustainability implies one set of issues in a third world country and another in a first or second world country. The third world country may be focused on trying to use crop rotation in agricultural land to limit nutrient depletion of the soil. A first world country may be primarily concerned with trying to implement recycling programs to decrease the amount of waste in landfills. Ideally, each country should be concerned with these and other issues as well, but that may not be the case in reality.

Given this broad spectrum of what sustainability is, there must be parameters placed on the project. It should be stated that this project does not attempt to create a completely sustainable development nor does it address all the techniques that can be used in sustainable developments. It does, however, address two specific issues -- land use and density -- and how they can make developments more sustainable by being more energy efficient and environmentally sensitive.

One of the constraints that is used in selecting sustainable techniques, as mentioned above, is that they must be viable. There are a variety of sustainable techniques (e.g., composting toilets, active solar energy systems) that are not addressed or included in the proposals because they have little chance of being implemented in the actual development due to lack of understanding and acceptance by the public and developer or other reasons. Providing realistic alternatives is an important part of this project.

It is assumed that developments incorporating amenities that appeal to individuals in upper income brackets will continue to be built. While it should be recognized that this lifestyle in itself goes against the idea of sustainability, it is however a reality of society. A significant contribution in the quest for a more sustainable society will be to design these "up-scale" developments that are more
environmentally sensitive than the traditional developments that we have come to accept.

Through research, knowledge is advanced in steps; it is rare that a research project will make "quantum leaps." Like research, societal problems must be solved in small, incremental steps that build upon each other. This project is intended to be one of those steps.

SIGNIFICANCE

The business of land development is one of cycles, fads and eras stimulated by societal trends and technological advancements. Developers of the built environment respond accordingly with whatever is in vogue. Industry, whether it is fashion or land development, responds by meeting demands of the consumer. Suburbia, shopping malls, condominiums, adaptive reuse and downtown revitalization are all examples of recent initiatives in the field of land development which were spurred by societal trends and technological advancement.

To be able to respond to consumer demand, developers monitor the attitudes and perceptions of people. Recently, the Chronicle of Higher Education (Dodge 1990, p. A1) reported that more college students are choosing academic majors that meet social and environmental concerns than in the past. This becomes significant because if, in general, people today are more aware of the environment and are becoming more involved in the solutions to environmental problems then they are more likely to be knowledgeable and responsive to alternatives geared toward solving environmental problems. Supporting this assumption, Chaffin (in Suchman 1991, p. 32) cites polls that show three-quarters of the American people think of themselves as environmentalists.

One could then speculate that this environmental awareness, as a characteristic of the consumer, will affect a variety of different industries ranging from
the way companies package products to the courses that are offered by institutions of higher education. Perhaps this should even affect the way planners design and developers build the real estate developments in the future. Chaffin argues that developers should both practice and market environmental sensitivity and conservation in their developments. Vieira agrees, stating that this environmental consciousness has made sustainable developments highly desirable to the growing number of concerned citizens. She emphasizes the marketability of sustainable developments, saying that "there is growing evidence that many people are looking for the features offered in sustainable developments (1990, p. 11)."

Applications of the sustainable ethic, such as waste-to-energy facilities, community-wide recycling programs and earth integrated buildings, illustrate a present concern for our non-renewable resources and a positive indicator that the sustainable ethic may be gradually becoming a part of our culture. Entire communities have embraced the concept of sustainability as illustrated by perhaps the most well-known example -- Davis, California -- which will be discussed below. Noted authors such as E. F. Schumacher (Small is Beautiful), Amory Lovins (Soft Energy Paths) and Lester Brown (Building a Sustainable Society) have discussed the necessity of a move towards a more sustainable society. Some of these visions have become reality in such ecologically planned communities as Cerro Gordo, Oregon; Van der Ryn's Solar Village and Corbett's Village Homes in Davis, California. Other examples include: Greenbrier, Virginia; The Woodlands, Texas; Seaside, Florica; Radisson, New York and Shenandoah, Georgia.

Designing for Efficiency

Calthorpe and Van der Ryn (1986, p. ix) contend that sustainability implies that there is a balance between the use of energy and materials in an urban region and what that region can supply continuously through natural processes that support life
(e.g., photosynthesis, biological decomposition). They suggest the immediate implications of the application of this principle to development are:

• a vastly reduced energy budget for cities;
• a smaller, more compact urban pattern interspersed with productive areas to collect energy, grow crops for food, fiber and energy, and recycle wastes; and
• new urban technologies that will become less dependent on fossil fuels and rely more on information and a careful integration with biological processes.

The latter implication, a shift from fossil fuel dependence to more reliance on information, reinforces the idea of the "information society". In the ten thousand year history of cities, there have been two significant societal transitions that have shaped urban form and the environment in which we live: the transition from a hunting and gathering to an agrarian society and the transition from agrarian to an industrial society.

Many people have recognized that another transition is occurring. John Naisbitt (1982) in Megatrends labeled this transition as being a shift from an industrial society to an information society. Some feel the impacts and implications associated with this transition are going to be far-reaching. Kelbaugh (1989, pp. 9-10) agrees, saying that the shift from an industrial to information and service based economy has been dramatic. Between 1973 and 1985 the service and information sectors gained from 82 to 110 million jobs while five million blue collar jobs were lost nationwide. The information society, Wentling and Bookout (1988) further explain, is bringing an increased momentum for change and flexibility in terms of housing options. This suggests a growing demand for convenience, location and lifestyle typically inherent in higher density housing, where residents will trade private space in order to live in a quality community. "Housing options for the information society will focus more than ever on time and its effect on lifestyle (Wentling and Bookout 1988, p. 9-10)." Paul Hawken, as quoted in Calthorpe and Van der Ryn (1986, p. xi), contends,
...that the shift in our economy and culture from an industrial to a post-industrial base is most clearly described as a shift from a 'mass' economy to an 'information' economy. This means that a specific cultural and economic function will be met not through the application of more resources and energy, but through more intelligent design -- design that replaces materials with higher quality information. The post-industrial era is one in which the major economic strategy will be carefully matching energy and resources to specific functions and values, rather than designing for markets. The economy is defined by the quality of information and the quantity of energy and resources available to it. The emphasis shifts from design for consumption to design for efficiency, or doing more with less.

Efficiency, as used in this context, is defined as the ability to produce something with the least amount of resources, effort or waste -- doing more with less.

Many people believe that the new charge for the environmental design disciplines is the shift from design for consumption to design for efficiency and the sustainable approach is a manifestation of that. One of the foundations of sustainable development is to use a site's natural features and resources as integral parts of the development rather than working against them -- i.e., doing more with less.

Perhaps this approach of design for efficiency will be one of the next major trends in land development. As awareness of environmental issues increases, alternative technologies, which sustainable developments embrace, will become more the norm rather than the exception.
CHAPTER TWO

METHODOLOGY

The reasons for selecting the Hamilton Proper site are that there was ready access to information as well as the expertise of the professional staff that is involved in the development process. Mansur Development Corporation has targeted this project at a segment of the population in higher income brackets. Generally, this group has the financial resources to invest in sustainable developments and is a part of a socio-economic class that is more aware of the benefits of environmentally conscious practices. Ideally, sustainable elements should be integrated into all types of development, from low-income housing to manufacturing plants. This study, however, focused on higher income developments because of the assumption that demand will continue for communities such as Hamilton Proper that have the amenities that appeal to the upper income market. Perhaps Hamilton Proper could be a model for other prestigious communities to follow.

First, goals for Hamilton Proper were formulated. These goals came from interpretations of the marketing prospectus (see appendix E) and interviews with personnel at Mansur Development Corporation and represent what the developer is striving to accomplish with Hamilton Proper. This project is intended to provide a presentation of alternatives for Mansur to consider in the subsequent phases of the development and understanding the developer's concepts and goals was very important to that. The goals identified, in no particular order, were:

- Create the image of a "prestigious community".
- Maintain profit potential of the development.
- Create a sense of community.
- Be sensitive to natural resources and incorporate those into the development.
- Enhance the residents' lifestyle and investment.
Several techniques and methods for a more sustainable development were then considered for implementation in Hamilton Proper. As stated above, it is beyond the scope of this thesis to examine all of the sustainable techniques and methods that are being utilized in development today. This project focused specifically on the exploration of the site planning phase of the development process and some of the related issues. These issues included:

- relationships and arrangement of land uses
- vehicular and non-vehicular transportation systems
- clustering of buildings
- increased density through lot and building design

To be considered, the technique had to meet two constraints. The technique must have been 1) viable and 2) cost effective. Viable means capable of being implemented (i.e., accepted by the public). Cost effective means the benefits (cost savings and quality of life) of implementing the technique are greater than the cost. This concept applies to both the developer and the consumer investing in property or buildings in the PUD. Case studies of those projects that have successfully used sustainable techniques and methods clarified the scope of the issues and delineated different alternatives in site planning. Previous studies that discussed methods of improving energy efficiency in developments were also reviewed. Common elements in many of the successful case studies were that they had a variety and mix of land uses and included higher density housing. Consequently, better land use planning and increased density are the two specific issues that were selected for further study.

The techniques meeting the two constraints were then evaluated in terms of achieving two objectives: 1) the technique resulted in less impact to the environment and 2) used resources more efficiently, both in comparison with traditional forms of development like Mansur’s original plan for Hamilton Proper. These two objectives
can be broken down as they apply to land, water, air and energy resources. Below are the specific objectives that were used in considering sustainable techniques:

- **Land** -- Minimize development of environmentally sensitive areas, agricultural land and wildlife habitat.
- **Water** -- Minimize destruction of existing wetland areas.
- **Air** -- Minimize air pollution.
- **Energy** -- Maximize efficiency.

The proposals for Hamilton Proper were then formulated and are explained in depth in Chapter Four. These were supported by research and case studies involving comparisons between sustainable and traditional approaches found in Chapter Three and under "Considerations" in Chapter Four. The proposals are alternatives of what could be implemented in Hamilton Proper, given Mansur's original concepts and goals. The alternatives are presented graphically to illustrate the comparisons between sustainable and traditional schemes. In the land use proposals, for example, the alternatives for sustainable land use are presented by "bubble diagrams".

The proposals were selected for several reasons. First, they met the constraints and achieved the objectives. Second, the proposals deal with sustainable alternatives in a larger context, rather than with the building elements. Byrne's (1979) study, which is discussed in Chapter Three, found that solutions to energy resource problems are occurring at the individual building level rather than the community level. Among the most critical of these problems is reducing impacts from transportation, which can be addressed through a large scale solution of better land use planning. This project recognizes that sustainable elements need to be implemented at every scale of development in order to improve the condition of our environment and resource supplies.
CHAPTER THREE

LITERATURE REVIEW

MENTALITY... SUSTAINABILITY V. FRONTIER

Some suggest that sustainability, which today has become somewhat of an environmentalist buzzword, was once an inherent part of many agrarian, preindustrial societies. It was an integral part of everyday life, built into beliefs, practices and design of the environment (Calthorpe and Van der Ryn 1986, p. iv). However, Chiras (1988, p. 434) disagrees: "The frontier mentality has been a part of human thinking for many tens of thousands of years, perhaps all of human history. For most of human history, population size has been small in comparison with the earth's resource supply. There always has been more, until recently". This is echoed by Savitz and Leighton (1977, p. 10) who state that the America that we know was, for the most part, built during an era of cheap and plentiful resources. Buildings were designed to minimize initial costs and were, therefore, very inefficient in terms of energy use. This influenced development practices and was a factor in the suburban sprawl that is characteristic of many metropolitan areas. Though authors on the subject differ in their perceptions of our historical attitudes toward nature and the environment, most agree that a change to a sustainable society is requisite for ensuring a good quality of life for future generations. Rees (1989, p. 3) further contends that sustainable development is not an option, but is our only viable choice.

Why then has the transition from frontier to sustainable been difficult to accept by the vast majority of the population? Part of the problem, Chiras (1988, p. 436) argues, is the idea of "biological imperialism", which is "the tendency for every organism to convert as much of the environment as possible into itself and its offspring." Humans are like the rest of the biological world, except we have
technologies to help us achieve that goal. Chiras (1988, pp. 437-441) also points to four, more personal, individual mindsets as another part of the problem: First, while understanding the limits of the earth's resources, people simply remain apathetic and believe that our environmental problems are someone else's responsibility. Second, most people have a self-centered, rather than a global perspective that justifies their actions. They are concerned with self, family and community. Third, their concern is only with the time frame of the present or near future. This restricted space/time perception can be detrimental due to the rapid rate of change in our society in terms of resources, population and pollution. Fourth, the feelings of insignificance of being just one of billions of people on earth is an excuse for many people. These mindsets combine to form a low-synergy society -- one in which the individual elements are working against the benefit of the whole. Ideally, we need to make the transition to a more synergistic society, where the individual parts are working together to have a greater effect than the sum of their individual effects. Brown (1981, p. 347) adds that values are key in the transition to a sustainable society because they influence behavior and determine a society's priorities and thus its ability to survive. Table 3.1 illustrates the differences between societies that have made the transition to a more sustainable value system and those that have not (Brown 1981, p. 351).

<table>
<thead>
<tr>
<th>Table 3.1</th>
<th>Value Contrasts in Pretransitional and Transitional Societies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prettransitional</td>
</tr>
<tr>
<td>Organizing Principle of Economy</td>
<td>Materialism</td>
</tr>
<tr>
<td>Nature of Product</td>
<td>Planned obsolescence; throwaway mentality</td>
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<tr>
<td>Relationship to Nature</td>
<td>Domination of nature</td>
</tr>
<tr>
<td>Scale</td>
<td>Bigger is better</td>
</tr>
<tr>
<td>Speed</td>
<td>Let's go faster</td>
</tr>
<tr>
<td>Specialization</td>
<td>Key to efficiency</td>
</tr>
<tr>
<td>Determinants of Status</td>
<td>Material possessions</td>
</tr>
<tr>
<td>Childbearing</td>
<td>Taken for granted, virtually automatic</td>
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Source: Worldwatch Institute
ECONOMICS... PLANNED DEVELOPMENT v. SPRAWL

Corbett (1981, p. 32) points out that since the advent of the automobile, urban sprawl has been the dominant pattern in which development has occurred. First, it is important to understand the basic differences in land use patterns to see the benefits associated with planned developments like Hamilton Proper as opposed to the pattern of sprawl.

The Real Estate Research Corporation (RERC) prepared a study in 1974 entitled The Costs of Sprawl for the Council on Environmental Quality, Department of Housing and Urban Development and the Environmental Protection Agency. The study examined the costs of different development patterns and compared three community types: low density sprawl, high density planned and combination mix. Low density sprawl was defined as entirely single family detached with seventy-five percent sited in a traditional grid fashion and the rest clustered. High density planned included seventy percent apartments, twenty percent townhouses and ten percent clustered single family homes. Combination mix had twenty percent each of conventional single family, clustered single family, townhouses, two story apartments and six story apartments. The approach assumed typical site conditions and an absence of any existing infrastructure and then estimated the costs of building alternative types of developments (RERC 1974, pp. 1-2).

In terms of land use, high density planned uses half as much land for transportation as low density sprawl. Four times as much land is used for residential purposes in the low density sprawl community as in the high density planned community (RERC 1974, p. 2). The economic cost comparisons supported the high density planned community. The high density planned community is lower in total investment costs -- twenty-one percent below combination mix and forty-four percent below low density sprawl. Forty-one percent of the savings result from increased density, with infrastructure (i.e., roads and utilities) construction costs being fifty-five
percent lower in high density planned community than in the low density sprawl community.

In assessing environmental costs, pollution was considered the largest and automobiles and residential heating were identified as the two major sources. The study stated that high density planned communities generated forty-five percent less air pollution than low density sprawl, due to the fact that they require less energy for heating and generate less automobile use. Storm water pollution and sediment are less in high density planned because there is less paving and consequently, less storm water runoff. According to the study, development type has no effect on sewage generated because it is a function of population. "In terms of other environmental factors, planning is the key to eliminating noise problems, preserving valuable wildlife and vegetation, and creating a visually attractive development (RERC 1974, p. 4)."

Energy consumption was determined by residential heating and air conditioning requirements and by automobile use. The study found that denser developments have lower heating and air conditioning requirements than traditional single family units. Savings were shown to be as high as forty-four percent with high density planned communities compared to low density sprawl.

The energy cost savings can be significant. Another study found that in cases where initial development costs increase due to complex energy systems, eventual savings in energy costs to the owner/operator will pay back the capital investment within three years. The study further concluded that substantial energy savings are possible through site design modifications within the development process. Reduction in energy consumption in the five case studies, when compared to conventional usage, ranged from 20 percent to 50 percent depending on the technologies used (Crane and Stellar 1981, p.7).

Robert Byrne, in cooperation with the Urban Land Institute (ULI), conducted another study entitled, "The Impact of Energy Costs and Supply Prospects on Land
Development Practices". The study consisted of a survey of the ULI members' "perceptions of developers' responses to the energy situation, respondents' perceptions of developers' response to government energy conservation efforts, respondents' own activities in regard to energy conservation and experiences with recent developments employing energy conserving measures (Byrne 1979, p. 6)." The main conclusion from the study was that most energy conserving activity is at the micro scale, in the building design and materials and in the energy systems of the buildings. There was less activity at the macro level which includes site design, location and size of developments (Byrne 1979, p. 12).

Byrne speculates on the reasons for emphasis of the micro elements of development. He states that energy savings at the micro scale are easier to quantify and those savings directly benefit the consumer. Quantitative measures of energy consumption in large scale development have only recently been developed and are not always sufficient for decision making purposes. Technical advances in energy conserving measures and government tax incentives have been focused mostly toward the micro elements. Finally, changes in micro elements, he argues, can be implemented with less disruption to consumer tastes and preferences (Byrne, 1979 p. 12).

While quantitative measures for energy consumption are not always sufficient for decision making, increases in acceptance and public demand for energy conserving developments can justify decision making that is more subjective. Also, while Byrne recognizes the importance of changing the practices of public regulators and developers, he neglects to mention that the public is the essential catalyst in changing those practices because regulators and developers respond to what the public wants, whether it be to get elected or to sell a project.

Other studies, however, have shown that significant cost savings result from energy conserving practices at the macro scale. Harwood (1977, p. 9) states that
forty-four percent of the combined energy for transportation and heating/cooling can be saved by better community design. He identifies several strategies to improve the energy efficiency of new development. First, encourage concentration of moderately high density development adjacent to urban areas to reduce the trip length between destinations. He adds that growth should be channeled along both transportation lines and utility systems (e.g., sewer and water lines). The second strategy is to shift the emphasis from single-family detached housing to attached or multi-family housing which uses thirty percent less energy for heating and cooling.

PUD AND LARGE SCALE DEVELOPMENT...

Understanding the planned unit development concept is important because it is a tool for implementing sustainable alternatives. The planned unit development (PUD) is both a physical plan and a legal concept. Usually, PUD's have a variety of land uses and/or housing types and open space or facilities owned in common. The PUD, as a legal concept, is a zoning classification that allows the developer and local government the freedom to change and negotiate the requirements of the development. For example, the developer may be given the freedom to increase the density of the development in exchange for an increase in the amount of green space. This is attractive to developers because it can allow building at higher densities or more efficient infrastructure development and flexibility in changing market demands (Moore 1985, p. 5).

Perhaps more important is that a PUD encourages, through flexibility, innovation in planning and development. In the past, a PUD was used to facilitate the planning and development of large sites. With higher interest rates and land acquisition costs, PUD's are generally decreasing in size and more recently have been used as a tool for developing difficult sites (Moore 1985, pp. 10, 35). Moore (1985, p. 5) comments that residential PUD's are an outgrowth of cluster housing and in many
cases there is little distinction between residential PUD's and clustering. But, unlike clustering, "PUD presents a substantive alternative to the use of traditional zoning regulations and can be adapted to the development of commercial and industrial uses as well (Moore 1985, p. 5)."

Moore (1985, p. 5) also points to increasing awareness of environmental issues as one of the factors in the rising popularity of PUD's. Most early suburban development had taken place on flat sites, which were then cleared of nearly all vegetation to make construction easier. The PUD concept, in contrast, encouraged preserving natural landscape features and open space by clustering development. Tomioka (1984, p. 175) continues, "increased preservation of the natural environment and open space, and their corollary of better land use and flexible site development, is the PUD's greatest achievement." The requirement that a substantial percentage of the PUD remain as open space permits the natural environment to be preserved and encourages development of greater recreational amenities.

Hamilton Proper is both a PUD and a master planned community (MPC). The terms are often used synonymously, but there is a difference. The master planned community is a community's physical plan that is designed using the best planning principles, but it lacks the freedom of the PUD because it is not a zoning classification. In essence, the PUD is a singular occurrence of a master planned community, but a master planned community is not necessarily a PUD. According to David Jensen, the land planner for Hamilton Proper, "a master-planned community is a far superior value for consumers than a traditional subdivision, because it is a completed environment with its future growth, look and lifestyle mapped-out from the very beginning and quality standards controlled and maintained (Mansur Development Corporation 1990, p. 3)." Some visionaries in the home-building industry say that master-planned communities may be as revolutionary in the 1990's as the subdivision was in the 1950's and 60's (Carlson 1990, p. 5B).
With nearly 1,300 acres, Hamilton Proper is a large scale PUD. Though not all PUD's are large in scale, some authors believe large scale development can be good for implementing energy conservation measures. In terms of energy conservation, large-scale developments are more adaptable to energy conservation than smaller projects because a wider range of facilities and services are required (O'Donnell and Parker 1977, p. 3). They further contend that, generally, the larger the scope of the development, the greater the opportunities for energy conservation because of both the greater number of individuals involved and the greater the possibility for interaction between systems (1977, p. 5). Some go so far as to say that, "The only way to achieve substantial energy savings through land planning is in large-scale developments or new communities (Urban Land Institute 1977, p. 20)." They continue by saying that there are several ways to include energy conserving features in new development design including land use arrangement. By designing mixed-use developments, community facilities residential areas and employment centers are in close proximity and the demand for vehicular transportation and hence, energy is reduced (Harwood 1977, p. 9 and O'Donnell and Parker 1977, p. 3).

CASE STUDIES

Davis California

Probably the most frequently cited and well documented of all the progressive, energy conscious communities is Davis, California. A key philosophical feature of the General Plan which was adopted in 1973 is conservation of resources and living within the community's means (McGregor 1977, p. 16). The Davis plan is based on efficient land use and "rationally distributed city services".

An important aspect of the Davis plan is, according to McGregor (1977, p. 16), the "outstanding cost-benefit relationship". She continues, saying "the demonstrable cost savings to the individual resident and the community as a whole can be applied to
any community and the cost benefits of the energy plan are substantial (McGregor 1977, p. 16). Savings of nearly $150,000 per thousand homes for utility bills, up to $1,000,000 per year for every 10,000 automobile owners and an unquantifiable amount to taxpayers for reduced city services (1977 dollars). In the case of the utility bills, the savings are attributed to building orientation, where seventy-five percent of the lots are sited on a north-south axis to maximize solar gain. Other methods are weatherstripping, window shading and increased insulation which are mandated by the community. In addition to efficient land use planning, transportation cost savings can be attributed, to a large extent, to a bicycle circulation network. Twenty-five percent of the travel in Davis is by bicycle, which translates to a savings of 330,000 gallons of fuel annually (McGregor 1977, p. 17).

Seaside, Florida

Robin Vieira (1990, p. 13) in "Designing Sustainable Developments", cites Seaside, Florida as an example of a more sustainable development. Seaside is an eighty acre resort town on the Gulf of Mexico coast of Florida. The development "refocuses on traditional American urban typologies; specifically that of a small Southern town before World War II (Duany and Plater-Zyberk 1984, p. 138)." The development is mixed use so the residents can walk from homes to commercial areas which reduces energy usage and also pollution. To encourage walking, the development uses narrow streets, slow speed limits and incorporates pedestrian-only paths. The zoning ordinance is the tool for maintaining the small town character. For example, picket fences are required in the case of deep set backs to maintain the street corridor. Also, porches (residential) and arcades (commercial) must be built to a certain percentage of street frontage.

The development is environmentally sensitive as well. All surfaces in the development are pervious which reduces thermal pollution and storm water run-off.
The roads are brick which is then laid in sand, driveways are not paved and sidewalks are crushed shells. Houses are landscaped with native vegetation and grass is prohibited on residential landscapes because it demands extensive watering in the Florida climate.
CHAPTER FOUR

PROPOSALS FOR THE PLANNED UNIT DEVELOPMENT

HAMILTON PROPER...MANSUR'S PLAN

According to Mansur's President Cornelius M. Ali, "By design, Hamilton Proper will be a prestigious community, a village with environmental sensitivity and the inherent themes of quality, lifestyle and value." Within that statement, there are several ideas that illustrate the concept behind Hamilton Proper and the goals of that project.

- Create the image of a "prestigious community".
- Maintain profit potential of the development.
- Create a sense of community.
- Be sensitive to natural resources and incorporate those into the development.
- Enhance the residents lifestyle and investment.

First, there is the image of a "prestigious community". Mansur determined that Hamilton Proper would be designed to appeal to a market in upper income brackets. There are certain elements that are identified with prestigious communities and are included in Hamilton Proper, among those are golf courses, country clubs, and large lots with large single family homes. The alternatives that follow are applicable to a prestigious community, but challenge the perception of what a traditional prestigious community looks like.

Second, there is the idea of "environmental sensitivity". Hamilton Proper contains protected wetlands which Mansur has preserved and marketed as an amenity. Is protecting wetlands enough or are there other opportunities to make environmental sensitivity a real commitment in the project? If environmental sensitivity is to be a key selling point, Hamilton Proper should go beyond just protecting wetlands. By having sustainability as a key element in the design of the
development, Hamilton Proper will appeal to the increasing numbers of more informed and environmentally conscious consumers.

An important goal, and perhaps the most important one from the developers perspective, is profit. The proposals for increased environmental sensitivity and energy efficiency that follow have been proven in other cases to be cost effective and can yield a profit equal to that of using traditional techniques. It should be stressed that the "bottom line" was considered during the formulation of these proposals and will be the ultimate consideration for implementation. Additionally, Hamilton Proper exemplifies the values of Mansur Development Corporation. Going beyond the norm in environmental sensitivity and energy efficiency with this planned development would position Mansur as an industry leader and be an investment in the reputation and future of the company.

LAND USE
Considerations

Land use relationships have impacts on the environment and energy use. Perhaps the greatest impacts come from transportation which, in all of its forms, consumed thirty-five percent of all energy and more than half of the petroleum in 1984 (McPherson 1984, p. 19). Harwood (1977, p. 9) advocates the use of mixed-use developments that combine residential, commercial and other activities because of the transportation energy savings of reducing trip length and trip generation between activity areas. This has been supported in a number of studies that have generally concluded that by using land use to encourage shorter trips or public transit, energy consumption for transportation can be reduced (Erley et al. 1979 p. 9). By including commercial facilities in close proximity to residential areas, immediate shopping needs of the residents can be met. This can also be accomplished by encouraging alternative modes of transportation (e.g., walking, biking or mass transit) to those areas.
Providing employment opportunities for some residents of Hamilton Proper should be considered as well. By including office facilities in the development and encouraging multiple use buildings that have both retail and office space, Hamilton Proper can also become the working environment for many of the residents.

**Proposal 1 Develop "pockets" within Hamilton Proper that combine residential, retail, office, recreation and open space land uses.**

Land planning consultant David Jensen states, "The Hamilton Proper master-planned community includes villages within a village, offering a wide range of residential, recreational and commercial land uses that are aesthetically, physically and economically supportive of one another and sensitive to the natural environment. A planned community is more than a house on a lot; it is a balanced and finished community with continuity (Mansur 1989, p. 2)." Peter Calthorpe (in Kelbaugh 1989) has advocated a new suburban design strategy called the "pedestrian pocket" which is related to Jensen's idea of "villages within a village". The pedestrian pocket is defined as "a simple cluster of housing, retail space, and offices within a quarter-mile walking radius of a transit system (Kelbaugh 1989, p. ix)." Pedestrian pockets are not New Towns or PUDs. They are about one tenth the size of most New Towns and are more heterogenous and comprehensive than PUDs because they have a more diverse mix of land uses. The principle idea to be gained from Calthorpe's proposal is the idea of pockets of residential, retail and office linked to other pockets by transportation systems within a larger planned development context. This is important in the larger context of Hamilton Proper because the phases can be developed as individual pockets with relationships to the other pockets as shown in Figure 4.1 below.
Phase one of Hamilton Proper, as currently proposed, includes no retail or office land uses. Preliminary development plans (see appendix B) for the entire PUD show a commercial area, but it is located in the southeast corner of the development. Another community services area is more centrally located at the northern boundary, however it has been planned as active recreation space (e.g., softball, soccer).

The pedestrian pocket takes the "villages within a village" that Jensen refers to a step further. For example, a more sustainable approach would be to have phase one become a pocket by including residential, recreational, retail and office land uses. Other phases would have this mix of residential and basic services (e.g., grocery, convenience store) in addition to having some services unique to that pocket (e.g., theatre, restaurant, school).
Figures 4.2 and 4.3 below show a comparison of conceptual land use plans:

Fig. 4.2 -- Current proposal for phase one

Fig. 4.3 -- A more sustainable proposal for phase one
Figure 4.4 and 4.5 compare Mansur's conceptual land use plan and a more sustainable proposal for Hamilton Proper. Fig. 4.5 shows how the system of pockets could be planned.

Fig. 4.4 -- Mansur's land use concept for Hamilton Proper

Fig. 4.5 -- Sustainable land use proposal for Hamilton Proper
Proposal 2  Link pockets within Hamilton Proper together by transportation systems, with an emphasis on non-vehicular systems.

As other phases or pockets are developed, they should become linked through vehicular and non-vehicular transportation systems. Particular attention should be made in the planning phases to develop the most effective system for travel between pockets. By encouraging methods of travel other than individual automobiles, pollution is reduced and energy is saved. Include alternative transportation systems such as bicycle and walking paths and incorporate elements to encourage usage such as fitness elements, landscaping, lighting, and picnic shelters. According to a marketing representative, jogging trails are included in Mansur's plan, but location has not been specifically determined yet. The non-vehicular systems should be planned at the outset. They should be designed not just as recreation, but to function as transportation systems to get from one place to another. It will be important to make these alternatives as attractive as possible to change the habits and perceptions that have been ingrained in the population so long. Even though attitudes are gradually changing, there is still a long way to go especially with the perception of the automobile as the only method of transportation.

While integral to Calthorpe's proposal, mass transit such as light rail may not be cost effective for the area at this time. It should, however, be planned for as a definite alternative in the future to the extent that possible areas for stations and lines are identified. Mass transit is becoming more cost effective and a more attractive option as the problems of congestion and pollution become greater. In fact, some transportation officials have estimated that a Los Angeles freeway rush hour trip of one-and-a-half hours today will take three hours by the year 2000 (Attoe 1988, p. 30). While this example may not be representative of the problem in the Indianapolis metropolitan area, it illustrates that congestion problems are increasing.
DENSITY

Considerations

Single-family detached homes tend to be less energy efficient than most multi-family homes, where common walls, ceilings and floors decrease heat flow through exposed surfaces. "Single-family detached homes, which comprise sixty-five percent of the housing stock, consume seventy-one percent of the total amount of energy used by the residential sector, or twelve percent of total U.S. energy consumption. Less energy is consumed per household in attached buildings than in detached structures and energy consumption per unit decreases as the number of units in the building increases (McPherson 1984, p. 21)." Other studies report that multi-family housing has been shown to use thirty percent less energy than single-family for space heating and cooling on a square foot basis (Harwood 1977, p. 9).

It was mentioned at the beginning of this chapter that there are perceptions and expectations that are associated with prestigious communities and among those are large lots with large, single family detached homes. As well, there are perceptions of higher density and more affordable housing and among these are that higher density communities are targeted toward lower income brackets. Wentling and Bookout (1988, p. iv) challenge those assumptions saying, "Homebuyers are redefining what they consider necessary and desirable in housing and higher densities are a part of this new definition." They continue by stating, "As a result of rising land and labor costs, higher interest rates and a myriad of other reasons, housing prices have skyrocketed, generating demand for higher density housing forms. In response, developers and designers have scurried to invent product types that satisfy today's density requirements while maintaining qualities traditionally held in high esteem (Wentling and Bookout 1988, p. 2)." They go farther by contending that higher density
housing is gaining in popularity not just for economic reasons, but because the market prefers it (1988, p. 2).

Their statements are well founded if we consider the following facts and statistics. The traditional nuclear family (i.e., two parents and children) represents barely one out of four new households. The rest are single parent families which make up twenty percent of new homeowners, unrelated individuals living together and the elderly (65 and over) which represent twenty-three percent of new homeowners (Kelbaugh 1989, p. vii). These "non-family" households are expected to represent a larger proportion of all American households in the future (Wentling and Bookout 1988, p. 8). Vieira (1990, p. 11) adds that, according to recent surveys, these non-family homebuyers list greater energy efficiency first or second in terms of what they are looking for in a home. As consumers, these "non-family" households will have a significant impact on the types of goods and services produced, including housing.

The dream of owning a home will not be a reality to many people because of increasing land costs. Wentling and Bookout (1988, p. 9) cite the factors affecting land costs as heavier environmental regulations, increased exactions from local agencies, additional developer responsibilities for providing infrastructure and public services and growth moratoriums that are sweeping many of the nation's major metropolitan areas. In four of the five largest eastern markets, average single family lot prices increased forty percent in 1985.

The average new home price has risen nearly twenty-two percent in the last four years, from $117,400 in 1986 to $149,400 in 1990, according to the National Association of Home Builders. Housing costs in general rose faster than the overall consumer price index in the 1980's (Wentling and Bookout 1988, p. 8). These increasing costs have priced many people out of owning the traditional three bedroom single family home. The national percentage of homeowners rose to a peak of 65.8 in 1980. By 1986, the percentage fell to 63.5; this erased the increase in homeowners
over the previous twenty years. "Among the solutions to maintain affordability will be increased residential densities. Higher land prices and labor costs can be directly amortized over a greater number of units through innovative designs for higher density housing (Wentling and Bookout 1988, p. 8-9)."

Proposal 1 Develop higher density housing types throughout the project while preserving the image of a "prestigious community".

This proposal does not call for the total elimination of the traditional single family detached house within Hamilton Proper. The proposal does, however, call for a more balanced and diverse selection of housing opportunities that responds to the changing demographic characteristics of the population as well as the issue of affordability. Rather than focusing on the housing type that the target market desires, design should include the qualities and elements that make single family detached housing appealing. Once these qualities are determined, higher density housing coupled with proper site planning can create communities that have the appearance of the traditional single family detached while being more environmentally sensitive and energy efficient.

The Overlook in Hamilton Proper is approximately twelve acres and is currently platted for six homesites, yielding a density of .5 units per acre (see Figure 4.6). Using some of the elements that are in the case study below, density could be increased while the image of a very prestigious community is maintained. A large scale community makes mass housing and higher densities more appealing (O'Donnell and Parker 1977, p. 3), which points to the importance of marketing the amenities of planned communities as a tool to change perceptions. To market estate homes at higher densities, Wentling and Bookout (1988, p. 11) contend that "the image of luxury must be replicated at a smaller scale, particularly from the street."
Fig. 4.5 -- The Overlook as currently proposed

Successful higher density developments have taken elements of the American icon, the estate home, and applied those to a new typology called small-lot villas. The case study below is a thirty home community called Villa D’Este which is within a prestigious 2,000 acre PUD called Sweetwater Oaks in Longwood, Florida (see appendix F). The site is located on 6.8 acres and bordered on two sides by a golf course. It is a private and secured community which adds to the perception of prestige and has amenities such as ornate fountains, special paving, landscaped plazas, a
security wall, pools and hot tubs and a variety of interior features that appeal to the upper income market. The single family, detached villas are on zero lot lines and the community has a density of 4.4 units per acre. Villa D'Este illustrates that other forms of higher density housing could be included in Hamilton Proper that would still appeal to the original target market of upper income home buyers.

Fig. 4.7 -- Villa D'Este, a small-lot villa community

Another option may be to reconsider the target market to include the growing number of non-family households. Because of many of the reasons mentioned above, higher density housing forms generally appeal to empty-nesters, single parents and unrelated individuals living together. The standard solutions are apartments and
townhouses. There are, however other alternatives that can be used that are more appropriate to the situation of Hamilton Proper and the image of that development.

In addition to apartments and townhouses, attached singles are another alternative that could be implemented. Attached singles are single family homes that share common walls. They are developed at higher densities per acre while establishing an image of detached housing. Attached singles are generally sited at densities between seven and ten units per acre. Whitman Pond in Weymouth, Massachusetts shows how good design and planning can alter the perceptions of the disadvantages associated with higher density housing (see appendix G). The community has eleven seven-unit clusters and is situated on six acres. Rather than being plotted in a linear pattern, each compact cluster is approximately ninety feet in length, thereby reducing road and utility costs. Maintenance costs are reduced because the clusters are sited around entry courtyards. The common wall construction result in both materials and energy savings. To the builder, savings result from a reduction in floor space and simplified utility installations. To the home buyer, a common wall insulates two dwelling units from exterior heat and cold resulting in less cooling and heating energy costs, which enhances the resident's investment (Erley et al. 1979, p. 7). The marketing strategy in Whitman Pond focused on convincing buyers that they could own a home for the same monthly cost of renting.
Fig. 4.8 -- Whitman Pond, a single family attached community

Fig. 4.9 -- A seven unit cluster in Whitman Pond
Proposal 2: Increase density by utilizing different site planning techniques such as clustering and zero lot line.

There are a variety of ways that land planners and developers can increase density. Clustering is one alternative and allows the development of smaller lots than those specified in the zoning ordinance. In exchange, the land that is saved is designated for common use, usually as open space (Sanders 1980, p. 1). It is environmentally sound because it preserves open space, natural drainage systems and other natural features because it concentrates dwelling units on the buildable portions of the site (Sanders 1980, p. 2). Clustering buildings close together encourages alternative modes of transportation such as walking and biking which reduces energy costs. Incorporating pedestrian and bike paths reinforces that commitment. Other savings result from a decrease in construction costs and maintenance costs for streets, utilities and services such as garbage collection.

Fig. 4.10 -- an example of the cluster concept
The technique is cost effective in that it allows a more economical use of the site because the developer can build at the maximum effective density. A study done in 1976 by the National Association of Home Builders documented the cost-effectiveness of cluster development. The study compared site development costs of a 166 acre development sited in the conventional fashion of quarter acre lots covering the entire site and a cluster design of the same number of units. The results showed that "more than $2,000 per dwelling unit could be saved if the cluster plan were used to subdivide the parcel (Sanders 1980, p. 1)."

Zero lot line is another technique that can be used to increase density. Zero lot line houses are sited on one side lot line and sometimes also on the rear or front lot line rather than having set backs on all lot lines (Bassett 1988, p.22 and Sanders 1982, p. 1). There are different lot configurations as shown in Figure 4.11 that can be used depending on the context of the site and desired density. The standard square lot can yield densities of eight to twelve units per acre when the zero lot line approach is used and parking is provided in bays rather than garages. The staggered lot yields densities between seven and eight units per acre and are best suited to straight rather than curvilinear roads. Zipper lots are wide and shallow and the interlocking pattern allows densities of five and one-half to seven units per acre. Pinwheel clusters give each unit a private yard that is separated from the other three and densities of twelve units per acre can be planned.
Fig. 4.11 -- Alternatives using zero lot line concept

square lot

staggered lot

zipper lot

pinwheel clusters
CHAPTER FIVE

SUMMARY AND CONCLUSION

SUMMARY

This project deals with the issue of sustainability in a planned unit development in the midwestern United States and how land use planning and increased density can make higher income developments more sustainable. The basic assumption in this study is that developments targeted at the upper income market can incorporate sustainable development techniques while maintaining profit potential characteristic of developments that do not include sustainable techniques. The research and case studies examined in this project illustrate that sustainable developments are energy efficient and environmentally sensitive when compared to more traditional developments. Also, sustainable developments can be cost effective and marketable.

The topic of sustainability is broad and the term has different implications depending on the problem or subject matter. Much of the literature dealing with sustainability is targeted toward problems associated primarily with the third world such as population control, nutrient depletion in soil, etc. While these issues should be dealt with in more advanced countries as well, there is perhaps a greater sense of urgency in third world countries to tackle these problems. Equally important will be dealing with the problems more readily associated with the first world, namely the United States. Changing perceptions about resources and consumption patterns will be critical for progress towards a more sustainable society. Assuming that there will continue to be prestigious developments that appeal to the higher income socio-economic class, progress toward a more sustainable society can be made if
developments incorporate energy saving measures in the design to make them more sustainable and if change happens at all levels in our society.

In selecting sustainable techniques, particular emphasis was placed on viability and cost effectiveness because providing realistic alternatives is an important aspect of this project. The techniques also had to have less impact to the environment and use resources more efficiently, when compared to traditional forms of development. Many of the alternatives that were found in case studies and the literature review are not appropriate for implementation at this particular point in time. Reasons may be that the technique is not cost effective, the imperfections have not been worked out or there is a lack of acceptance by the public and/or developers. While research of this nature is very important in exploring alternatives, consideration must also be given to what is appropriate now for developments. Implementation must be a primary consideration in evaluating sustainable techniques. Applying these sustainable techniques in actual developments is the only way real progress will be made.

This project focused on two issues -- land use planning and density -- and how these can make developments more sustainable. The result is four proposals that are recommended to achieve a more sustainable development. One, develop "pockets" within Hamilton Proper that combine residential, retail, office, recreation and open space land uses. Two, link pockets together by transportation systems with an emphasis on non-vehicular systems. Three, develop higher density housing types throughout the project while preserving the image of prestige. Four, increase density by utilizing different site planning techniques such as clustering and zero lot line.

CONCLUSION

What can be gleaned from this study is that planned unit developments can incorporate alternative techniques that have a significant effect on energy consumption
and less impact on the environment while remaining cost effective and marketable. By encouraging mixed land uses and non-vehicular transportation systems, energy consumption can be reduced and consequently pollution. In some cases, construction and maintenance costs can be reduced as well. Also, by increasing density, environmentally sensitive areas can be preserved and more open space can be included in developments without sacrificing profit. There are several examples of higher density housing developments that have been successfully marketed developments to the upper income segment of the population while providing the amenities that appeal to that group.

FINAL THOUGHTS...

Few can argue that sustainable development is a better alternative than the traditional developments that we have become accustomed. How, then, do we bring about this transition from traditional development to sustainable development? Selling the concept of sustainable development and being able to communicate its advantages is probably the next important step in looking at land development from a sustainable mentality rather than a frontier mentality. The individual must be at the center of these efforts. Changing mindsets and perceptions at the grass roots level will be critical if we are to ensure a better quality of life for future generations.

Perhaps William Rees (1989, p. 3) said it best. "Sustainable development is not merely an option. It is our only viable choice."


REFERENCES CITED


HAMILTON PROPER

(Homesites ranging from $39,900 to $250,000)

Each of the distinct villages of Hamilton Proper features a landscaped signature entryway accessible from the scenic road looping around The Hawthorns Golf & Country Club, the centerpiece of Hamilton Proper.

<table>
<thead>
<tr>
<th>Village</th>
<th>Homesites</th>
<th>Average Homesite Size</th>
<th>Minimum square footages 1 story</th>
<th>1-1/2 story</th>
<th>2 story</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomy Ridge</td>
<td>60</td>
<td>.4 acre/17,932 sq. ft.</td>
<td>2,000</td>
<td>2,400</td>
<td>2,400</td>
</tr>
<tr>
<td>Chestnut Hill</td>
<td>36</td>
<td>.5 acre/21,790 sq. ft.</td>
<td>2,200</td>
<td>2,600</td>
<td>2,600</td>
</tr>
<tr>
<td>Brooks Crossing</td>
<td>28</td>
<td>.7 acre/30,506 sq. ft.</td>
<td>2,500</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>The Hawthorns</td>
<td>30</td>
<td>1+ acre/45,000 sq. ft.</td>
<td>3,000</td>
<td>3,500</td>
<td>3,500</td>
</tr>
<tr>
<td>The Overlook</td>
<td>8</td>
<td>1.4 acre/60,980 sq. ft.</td>
<td>3,000</td>
<td>3,500</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Distinctive Features:
- Lake-front and cul-de-sac homesites
- Richly landscaped boulevard
- Entrance across from 14th hole of The Hawthorns Golf & Country Club
- Landscaped community park
- Entrance across from The Hawthorns Golf & Country Club and estates
- Estate-size homesites
- Landscaped boulevard
- Richly landscaped cul-de-sacs/islands
- Entrance across from 16th green and 17th tee of The Hawthorns Golf & Country Club
- Estate-size homesites
- Heavily landscaped private entrance
- Golf course frontages
- Wooded homesites
- Private signature entry
- Vistas of golf course, lakes, and preserved natural areas
- Estate-size homesites
- All homesites adjoin the 16th hole of The Hawthorns Golf & Country Club
- Vistas of golf course, lakes, and preserved natural areas
- Landscaped buffer along Hawthorn Ridge

Prices and sizes of homesites are subject to change at any time, without notice.

Appendix D
HAMILTON PROPER OPENS SALES AND INFORMATION CENTER

"BLUE-RIBBON TEAM" DESIGNS AND DEVELOPS HAMILTON PROPER
MASTER-PLANNED GOLF COMMUNITY CONCEPT ENHANCES QUALITY, LIFESTYLE AND VALUE

Hamilton Proper homesites are now available for presales at the temporary sales and information center, according to Indianapolis-based Mansur Development Corporation. The temporary sales and information center is located at 116th, immediately east of Hoosier Road; the permanent sales and information center will be completed next spring. Mansur commenced initial site preparation and construction at Hamilton Proper in July of 1990. Hamilton Proper, located in southeastern Hamilton County, northeast of Indianapolis, is a 1,300-acre master-planned community featuring preserved natural areas, two 18-hole golf courses, and a private country club.

According to Mansur President Cornelius M. Alig, "By design, Hamilton Proper will be a prestigious community, a village with environmental sensitivity and the inherent themes of quality, lifestyle, and value. Distinctive neighborhoods and homesites have been planned around exceptional amenities, including preserved natural areas and lakes. The creative master plan for the community, which will guide its growth over the next 10 years, includes a country club, golf courses, jogging trails, neighborhood landscaping, community center, commercial and community service areas. Architectural standards and landscape requirements have been established to assure a unified quality to the neighborhoods. The entire community is designed to preserve and enhance a homeowner's lifestyle and investment. I know of no other community in Indiana that provides for the level of quality and design, for more than 1300 acres, as Hamilton Proper."

- more -
Phase one of Hamilton Proper will include 162 homesites in five distinctive neighborhoods, an 18-hole championship-caliber golf course, and a marketing center.

Hamilton Proper, zoned as a planned unit development, is roughly bounded by 116th Street on the north, Brooks School Avenue on the east, 106th Street and Fall Creek Road on the south, and Cumberland Road on the west.

Hamilton Proper East, located east of Hoosier Road, will feature The Hawthorns Golf & Country Club, a private club, covering approximately 200 acres, with a championship-caliber 18-hole golf course designed by nationally-acclaimed Arthur Hills & Associates. Homesites in Hamilton Proper East will be suitable for custom homes priced from $200,000 to over $1,000,000. Hamilton Proper West will include a semi-private 18-hole golf club, and will fulfill the demand for homes of $140,000 to $240,000.

Mansur also announced that 22 parcels of Hamilton Proper, totaling approximately 400 acres, have been presold to Land Innovators Company to be maintained as Hamilton Proper West, in accordance with Mansur's original masterplan and restrictions for Hamilton Proper. Land Innovators Company will coordinate sales to individual builders within these parcels. This arrangement will allow a greater variety of housing types and price ranges within Hamilton Proper. Land Innovators Company is an Indiana limited partnership of which R.N. Thompson is a general partner.

According to Alig, "Thompson is one of Indianapolis' finest developers, having developed more than 30 of Indianapolis' most successful residential communities since 1960. Thompson's participation in Hamilton Proper will be a definite plus to our 'blue-ribbon' team." Thompson's residential communities include Crooked Creek, Burburry Place, and the golf community of Saddle Brook.

As part of the master plan, Thompson will expand and upgrade Hamilton Proper's second golf course, the existing 9-hole Mud Creek Golf Course, which will become a semi-private 18-hole golf club.
"BLUE-RIBBON TEAM" DESIGNS AND DEVELOPS HAMILTON PROPER

Mansur has assembled a "blue ribbon" development team that combines the expertise of a nationally recognized land planning consulting firm, David Jensen Associates, with one of the top four golf course design firms in the United States, Arthur Hills and Associates. Attorneys Hyatt & Rhoads are noted nationally for their counsel on builders' programs, community associations, and covenants, conditions, and restrictions for successful master-planned communities.

Other team members, besides Mansur, include four local firms: Land Innovators Company; Campbell, Kyle & Proffitt; Paul I. Cripe, Inc.; and A & F Engineering Co, Inc., all of which are well respected for their individual expertise.

C. William Wright serves as a builder and developer consultant for Hamilton Proper, and will also be a Charter Builder within a number of the high-end custom estate neighborhoods.

MASTER-PLANNED COMMUNITY ENHANCES VALUE, LIFESTYLE AND QUALITY

According to David Jensen, land planner for the project and a noted national spokesperson on planned communities, "A master-planned community is a far superior value for consumers than a traditional subdivision, because it is a completed environment with its future growth, look, and lifestyle mapped-out from the very beginning, and quality standards controlled and maintained. The predictability and sense of completeness inherent in a planned community makes purchasers more comfortable with their investment and usually provides for quicker resales than in conventional subdivisions."

Jensen continued, "The Hamilton Proper master-planned community includes villages within a village, offering a wide range of residential, recreational, and commercial land uses that are aesthetically, physically, and economically supportive of one another, and sensitive to the natural environment. The Hamilton Proper community offers a sense of neighborhood identity, life style satisfaction, variety in housing types, amenities, coordinated land planning, architecture, and landscaping, and attractive living environments. A planned community is more than a house on a lot. It is a balanced and finished community with continuity."
The Hamilton Proper master plan includes:

- Approximately 40 distinctive neighborhoods
- A prestigious 18-hole golf course and country club
- A semi-private 18-hole golf club
- A community-oriented swim and racquet club
- Community service sites for schools or churches
- Natural areas and protected wetlands
- A neighborhood commercial center
- Community parks and recreation areas
- Jogging and fitness trails

The Hawthorns Golf & Country Club, the centerpiece of Hamilton Proper, will provide members and homeowners with panoramic views of preserved natural areas, wetlands, and lakes, as well as the lush fairways and greens of a tournament-caliber 18-hole golf course. The Hawthorns golf course was designed by the firm of Arthur Hills and Associates, known throughout the United States, as well as in Europe, Japan, and Canada, for championship-quality golf course designs which are sensitive to the natural environment. Hills best known course is Eagle Trace, at Coral Springs, Florida, site of the Honda Classic each spring. Two other Hills courses featured on the Senior PGA Tour are Tampa Palms, in Tampa, Florida -- of which Gary Player has said: "We wish we could play a course like this every week" -- and The Club at Pelican Bay, home of the Aetna Challenge. Other notable Hills' courses include Bonita Bay, the Arthur Hills course at Palmetto Dunes, and Tall Grass in Wichita, Kansas, to name a few.

PHASE ONE CONSTRUCTION COMMENCED IN SPRING OF 1990

Construction of phase one of Hamilton Proper, which commenced this past spring, includes the development of 162 homesites in five distinctive neighborhoods with sites from 1/3 to 1.7 acres; construction of the Arthur Hills championship-caliber 18-hole golf course; and construction of the Hamilton Proper Marketing Center and community-oriented recreational facilities, including a swimming pool, tennis courts, and fitness trails. Applications for membership in the private Hawthorns Golf & Country Club will be available this spring.

Homesite sizes and prices for phase one will vary according to the neighborhood and its special features and character. Exclusive addresses will be within the estate sections which will offer golf course frontages or access to The Hawthorns Golf & Country Club, signature entries and guard houses. Other neighborhoods will feature landscaped neighborhood parks, lake-front homesites, signature entries, and natural areas.
MANSUR PRESERVES AND PROTECTS WETLANDS FOR COMMUNITY AMENITIES

The master plan of Hamilton Proper includes natural wetlands, approximately 24 acres of which are located in the phase one area. Mansur plans to preserve the wetlands as amenities to the community.

According to Keith I. Thomas, Mansur's project director, "When we began planning this project, we recognized the importance of the wetlands as a wildlife habitat that would also provide spectacular views, and enhance the natural aesthetic character of the community. Both our land planner and golf course designer have reputations for designing responsible plans which are sensitive to protected natural areas such as inland wetlands."

At one time, environmental groups had raised concerns about Mansur's initial plans for the wetlands. Mansur responded to these concerns by conducting meetings and work sessions with representatives of local environmental groups to obtain their advice on how to best incorporate the wetlands into phase one of Hamilton Proper. This advice was subsequently included in revised plans. Environmental groups consulted include the National Audubon Society, Citizens for Greenspace, Friends of the White River, Groups Advocating Urban Greenspace Environments, Hoosier Environmental Council, the Indiana Wildlife Federation, and the Sierra Club.

The revised wetlands plans, which have received federal approval from the U.S. Army Corps of Engineers, involve minor impact on the wetlands, and will create 50-foot buffer zones around each wetland to protect the areas. According to the approved plans, only about one-third of an acre of these wetlands will be disturbed. Plans include a net gain of about two-thirds of an acre of wetlands.

According to Harry S. Nikides, executive director of the Indiana Wildlife Federation, "This is a good example of how developers and environmental groups can work together to come up with a solution for maintaining the wetlands and still allow development in the area."

Nikides continued, "It's been rare for environmental groups and developers to come up with such a solution that both are pleased with." Nikides has assisted Mansur's land development engineers, Paul I. Cripe Inc., in incorporating the suggestions of the environmental groups in the revised wetlands plans.
MANSUR DEVELOPMENT CORPORATION

Since its founding in 1982, Mansur Development Corporation has made a strong commitment to high-quality, economically responsible developments -- developments which enhance the growth and integrity of a community. Many of the projects in Mansur’s diverse portfolio, valued at over one-half billion dollars, have played a significant role in the renaissance of Indianapolis. Mansur’s developments include the Century Building, Lockerbie Marketplace, Market Tower, Illinois Building, Omni Severin Hotel, Farm Bureau Insurance Headquarters, Quadrant Four, and the Associated Group Headquarters Building at Mansur Center.

According to Alig, Mansur's president, "Hamilton Proper signifies a long-term commitment to the residential real estate industry which will play a significant role in the future of Mansur Development Corporation."

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VILLA D’ESTE AT SWEETWATER
LONGWOOD, FLORIDA

Donald F. Evans

Located within the prestigious Sweetwater Oaks master-planned community in central Florida, Villa D’Este was designed to appeal to wealthy professionals wanting an estate or country club lifestyle without the burden of maintaining a large property. Because many product types are available within the 2,000-acre Sweetwater PUD, including other golf villas, single-family homes, and luxury estates, Villa D’Este had to project a distinctive character to compete successfully with lower-density products.

The solution was to create a private enclave of 30 zero-lot-line golf villas reminiscent of an Old World Mediterranean village. Lush landscaping, private entry courtyards, ornate fountains, stamped concrete pavers, and Renaissance-style sculpture all convey the elegance and prestige necessary to attract affluent buyers to these small-lot villas.

DEVELOPMENT STRATEGY AND FINANCING

Styled after a very successful, similar project in Deerfield Beach, Florida, Villa D’Este was conceived to fill a gap in the Orlando housing market. The developer recognized

- Stamped concrete paving and lush landscaping create a luxurious streetscape. Garage doors are set back 20 feet from the curb and are made of carved stained wood to give a positive visual effect.

Donald F. Evans, AIA, is president and founder of the Evans Group, a full-service architectural and land planning firm. With offices in Orlando and Jacksonville, Florida, the group has earned approximately 300 design awards in 12 years. Evans is a member of the National AIA Housing Committee and a featured speaker at many housing industry events.
Located on a 6.8-acre site bounded on two sides by a golf course, Villa D'Este is a private enclave of 30 houses designed to appeal to upper-income buyers. The zero-lot-line design allows a density of 4.4 units per acre—substantially higher than buyers in this bracket typically have accepted. As a trade-off for higher density, homes offer elaborate design features, extensive use of quality materials, and the reassurance of privacy and security.

that move-down buyers in central Florida had virtually no other small-lot luxury community to consider. He also saw the potential for sales to the second-home market segment.

Because of high land costs that amounted to $100,000 per unit, creative financing programs were used to lure potential buyers. One plan, for instance, called for no payments for two years if the buyer put down 20 percent of the sales price. All homes were sold on fee simple lots, with individual yard maintenance handled by a homeowners' association.

SITE PLANNING

Faced with the challenge of siting 30 luxury homes on a tight parcel of 6.8 acres, the land planning team oriented the rear of each lot toward the bordering golf course to provide premium views. Interior pools and gardens serve as focal points to expand the internal living space and to maximize individual unit privacy. These outdoor living environments also capitalize on central Florida's ideal weather conditions.

Thirty patio lots were arranged along the perimeter of the wedge-shaped site with a common, state-of-the-art security-controlled entrance, accessed from a small road within Sweetwater Oaks. Lot sizes were approximately 53 feet wide and 110 feet deep, allowing a density of 4.4 units per acre.

In keeping with the European design theme, the homes are clustered around three landscaped plazas with ornate fountains and special paving. These common grounds act as a focal point of the community and enliven the streetscape. Plant materials are formal and stately, highlighted by Canary Island date palms, manicured yew shrubs, and bright flower beds. A carefully detailed stucco wall surrounds the project to preserve privacy and security.
ARCHITECTURE

Stucco exteriors accented by tile band detailing, colored tile roofs, and arched entry gates carry through the Old World Mediterranean theme. The main entry courtyard for each home is tucked behind a two-car garage for added privacy, and features an ornate fountain, stamped concrete pavers, and eight-foot, carved wood double doors opening into a ceramic tile foyer. A beveled glass fanlight above the doorway adds elegance and establishes the arched doorway design theme that is repeated throughout the villa.

Three floor plans were designed to meet the needs of the upscale buyer profile, including a 2,102-square-foot, two-bedroom plan; a 2,150-square-foot, two-bedroom plan with den; and a 3,280-square-foot, three-bedroom plan with library.

The project architect specified volume ceilings wherever possible to enhance spaciousness in the plans. Flat trusses were used to retain a maximum ceiling height; although labor costs were slightly higher as a result, the increase in the perceived value of the villa justified the additional expense.

The smallest floor plan has 2,102 square feet; a master bedroom suite with his-and-hers walk-in closets; a guest bedroom; two and one-half baths; a living room; a library; and a breakfast room. With a single-level layout, the plan features extensive skylights and glazing.
Interior features promote a sense of quality and luxury with extensive use of wood molding, high ceilings, and beveled and stained glass windows. All houses feature double French doors leading to rear yard patios that serve as an extension to the everyday living space in this temperate Florida setting.

Many other luxury design features convey a feeling of grandeur. Double doors with arched transom glass lead to the master suite. Arches are repeated in recessed wet bars, transitions from room to room, recessed shelving, and a recessed cooking wall in the kitchen. Overhead plant shelving embellishes high spaces and softens light from clerestories and skylights. Continuing the Mediterranean design theme, patios feature columned archways, fountains, and colored tile.

As large as 21 feet by 17 feet in one model, master suites appeal to the uncompromising standards of the high-end buyer. Double French doors lead to a lanai, adding to the open feeling of the room. Master baths feature imported ceramic tile, double vanities with a dressing area, oversized Roman tubs, separate glass-enclosed showers, and his-and-her walk-in closets with skylights.

The largest floor plan, with 3,280 square feet, contains three bedrooms; three and one-half baths; a library; formal and informal living rooms; and a breakfast room. The two-story design keeps the master bedroom suite on the first floor, which is a strong market preference.
Designed for people who entertain frequently, the kitchens are spacious and sophisticated, with wood cabinets and ceramic tile countertops. A large greenhouse solarium in the adjoining morning room and a greenhouse window over

- Limited back yard space is used to the fullest: pool, spa, raised planter boxes, and extensive patio areas are common features. The emphasis on quality over quantity is exhibited in the use of expensive materials and attention to design details.

- From the first point of entry, Villa D'Este conveys an image of luxury and quality. Privacy and security are ensured by the gated guardhouse.
the sink add natural light and make the kitchens seem even larger.

Energy conservation features include bronze-tinted sliding glass doors and windows, R-19 ceiling and R-11 wall insulation, paddle fans, and an air-conditioning system with a heat exchanger for water heaters.

MARKETING

Although the developer initially envisioned a second-home market for the villas, the majority of buyers have been dual-income professional couples or move-down buyers. The double garages, his-and-her walk-in closets, and gourmet kitchens appeal to both categories of buyers.

Sales resulted from substantial advertising in the local newspaper and various magazines; recognition as a national award recipient; broker networking; and creative financing packages.

<table>
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<tr>
<th>PROJECT DATA</th>
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<tbody>
<tr>
<td>LAND USE INFORMATION:</td>
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<td>Site Area: 6.8 acres</td>
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<td>Roads/Parking Area</td>
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Notes:
*Two-car attached garage, plus driveways.
*Greenbelts, entry signage and security, and landscaped plaza.
*Homes are built upon purchase, so unit mix is not final.
*+$100,000 per unit.
*+$40,000 per unit.

DIRECTIONS:
From Orlando International Airport, take the Beeline Expressway west to Interstate 4 east. Exit Interstate 4 east at State Road 434 and go west to Wekiva Springs Road. Go right on Wekiva Springs to Sweetwater Sales Center.

DEVELOPER:
Carl Trauger
Trendsetter Homes
651 Via Genova
Deerfield Beach, Florida 33441

LAND PLANNER:
Berroscapa
The Evans Group
618 South Magnolia Avenue
Orlando, Florida 32801

ARCHITECT:
The Evans Group
618 South Magnolia Avenue
Orlando, Florida 32801

AWARDS:
* Best in American Living Grand Award
* Grand Aurora Award
* Aurora Detached Home of the Year
* PAME Award (First Place)
WHITMAN POND
WEYMOUTH, MASSACHUSETTS

Paul J. Carroll

In a market with a surplus of larger and older attached housing, Whitman Pond Village effectively demonstrates how appropriate design and planning can mitigate the disadvantages traditionally associated with higher-density programs. A townhouse community of 11 seven-unit clusters on six acres, Whitman Pond Village employs open interior planning to create an illusion of space, making each unit seem larger than its 600 to 800 square feet. To further diminish the impression of density and to promote socializing among neighbors, each cluster shares an entrance courtyard. And although the units are small in comparison to other attached housing in the area, high-quality construction and materials give them the substantial character that encouraged many renters to become first-time homeowners.

Paul J. Carroll, AIA, is head of Paul J. Carroll Associates based in Boston, Massachusetts. His design practice includes commercial and office buildings, shopping centers, health care facilities, and large-scale residential projects. Carroll is a member of the National AIA Housing and Codes Committee.

Instead of plotting these townhouses in a linear pattern, the architect grouped them into compact clusters that measure only 90 feet in length; thus, road and utility costs are reduced. The clusters also permit at least five of the seven units to have more than two exposures to the outdoors.

Appendix G
The central courtyard provides a point of entrance to each of the seven units grouped within the cluster. High-pitched roofs and clapboard siding follow the traditional New England style.

DEVELOPMENT STRATEGY

The developer's intent at Whitman Pond was to provide traditional, yet individualized, townhouses; to create homes that offer style and privacy; and to offer buyers the attributes that foster pride of ownership. The prime objective was to build housing at affordable prices for a market whose annual incomes range from $20,000 to $30,000. Although not directly subsidized, the project was the first to come on line under a Massachusetts program offering below-market mortgage interest rates to first-time buyers.

Modular construction and a fast-track construction program created significant cost reductions. However, an efficient site plan helped most to minimize construction costs. The site concept led to a reduction in road surface and utilities, thereby lowering dramatically the per-unit cost of site improvements.

SITE

Whitman Pond Village's site was a passed-over, nonconforming parcel in a primarily single-family residential area. The land was relatively inexpensive because of large rock outcroppings that limited its development potential. A bonus for the developer was an adjacent lake with bath houses, a public recreational facility that eliminated the need to budget for on-site amenities.

PLANNING

Essential to the reduction of construction and maintenance expenses was siting unit clusters around entry courtyards. With typical townhouse planning, a seven-unit building measures at least 140 feet to 160 feet in length. Structures at Whitman Pond total only 90 feet in length, allowing significant infrastructure cost savings.

Each of the 11 seven-unit clusters is arranged in a pinwheel configuration, with a landscaped entry courtyard at the center and grade-level patios for each unit at the perimeter. This concept afforded a yield of 12.8 units per acre, with 66 percent of the site remaining in open space. Shared open space compensated for the higher density by providing outdoor living areas and increased opportunities for communal activity.

Each building contains a mix of one- and two-bedroom units. Five units in each structure have more than two exterior exposures for maximum light and ventilation. The 20-foot-by-20-foot foundation of each
Although only 20 miles from downtown Boston, this six-acre site was skipped over because of numerous rock outcroppings that made it difficult to develop. The small clusters allowed the architect to work around the outcroppings and mature trees. With 11 seven-unit clusters, a density of almost 13 units per acre was achieved.

Existing rock formations were used to good advantage as a landscape element, complemented by the retention of many mature oaks and elms. Distinctive gates identify entries to unit clusters.

Modular and prefabrication construction techniques were used to maintain affordability without compromising quality. Each unit has an at-grade, fenced patio located around the perimeter of the cluster.
ARCHITECTURE

Many of Whitman Pond's buildings are modular components. With off-site prefabrication, labor costs were reduced and the construction schedule was compressed—an added benefit in New England's long winter season. Four-foot building increments, an interchangeable unit plan, energy-conserving common walls, and back-to-back plumbing afforded additional economies.

Whitman Pond Village's design incorporates many amenities not commonly found in affordable housing. Among these features are volume ceilings, private patios, spiral stairs, fireplaces, and air conditioning. Within the constraints of prefabricated components, the architecture is an updated rendition of forms and materials traditional in the New England design vocabulary—white clapboard, high-pitched roofs, and a rambling footprint.

APPROVAL AND FINANCING

A streamlined development application process allowed the town's planning board to approve plans and drawings in only one day. At a time when the market rate was 14 percent, the Massachusetts Housing Finance Agency offered mortgage financing at 10 percent interest, with only a 5 percent downpayment.

- The 20-foot-by-20-foot unit pads can accommodate any of the four floor plans. This flexibility allowed units to be built in accordance with market demand. Most of the 77 units—which ranged in price from $53,000 to $65,000—were purchased by first-time homebuyers.
MARKETING

With a smaller, denser product, the marketing challenge was to convince buyers that, with a small initial investment, they could own homes for the same monthly cost as renting. Minimal advertising coupled with the attractive financing package resulted in sales of all 77 units within six months, at prices ranging from $53,900 to $66,000. As anticipated, most buyers are young, first-time homeowners. This award-winning concept was repeated successfully in Washington, D.C., and New Hampshire.

PROJECT DATA

LAND USE INFORMATION:
Site Area: 6 acres
Total Units: 77
Density: 12.8 units per acre
Parking Spaces: 149
Parking Index: 1.9 spaces per unit

LAND USE PLAN:

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<th>Acres</th>
<th>Percent of Site</th>
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<td>Buildings</td>
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UNIT INFORMATION:
Number of Townhouse Units: 77
Size: 630 to 800 square feet
Program: 3-bdrm/2-bath, 1-bdrm/1-bath
Sales Prices: $53,900 to $66,000

ECONOMIC INFORMATION:
Site Value: $550,000
Land Improvement Costs: $268,000
Construction Costs: $40 to $43 per square foot
Homeowner Fee: $50 per month (originally)

DIRECTIONS:
From Logan Airport, take Southeast Expressway to Route 3 south; exit Route 3 south at Exit 16A. Turn right on Route 63 (second traffic light), turn left on Pleasant Street (first traffic light), turn right on Lake Street (first traffic light), and proceed to Whitman Pond Village on left.

DEVELOPER:
Box Properties
47 Winter Street
Post Office Box 38
Weymouth, Massachusetts 02191

ARCHITECT:
Paul J. Carroll and Associates

AWARDS:
- Grand Award, Builder magazine. Best Small Attached Housing Project, 1984