

**NEW URBANISM AND RESPONSIVE ENVIRONMENTS: A CRITIQUE OF
NEW URBANISM THROUGH A COMPARATIVE ANALYSIS OF
FOUR CONTRASTING COMMUNITIES – KENTLANDS, MARYLAND;
LAGUNA WEST, CALIFORNIA; ELMWOOD, CALIFORNIA;
AND FOUR COLONIES, KANSAS**

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ABSTRACT

This thesis is an evaluative study of New Urbanism, a recent approach to community design that emphasizes walkable, mixed-use neighborhoods where buildings of a unified architectural style form coherent public spaces where people see and interact with each other.

This study evaluates the effectiveness of New Urbanism, using criteria from *Responsive Environments* (Bentley et al., 1985), a guidebook for urban design. According to Bentley et al., responsive environments are places that "provide [their] users with an essentially *democratic* setting, enriching their opportunities by maximizing the degree of *choice* available to them" (1985, p. 9).

In presenting an evaluation of New Urbanism, this study begins by discussing the history of New Urbanism, its underlying philosophy, and its major design characteristics along with evaluations of New Urbanism, including economic, sociological, planning, architectural, and behavioral critiques.

To evaluate New Urbanism empirically, the study uses three criteria from *Responsive Environments*. The first criterion, *permeability*, is the ease with which the pathways of an urban district allow users physically to get from one place to another in that district. The second criterion, *variety*, refers to an urban district that has a range of activities, functions, and building types and therefore attracting different users at different times of day and night. The third criterion, *legibility*, is the quality that makes a place mentally graspable and thus imageable and coherent cognitively.

To evaluate New Urbanism in terms of these three criteria from *Responsive Environments*, the thesis analyzes four real-world communities in the United States. Two of these communities – Kentlands and Laguna West – are New Urbanist developments built in the last five years. A third community – Elmwood – is a small-block, high-density, traditional urban neighborhood in Berkeley, California, while the fourth community – Four Colonies – is a low-density, automobile-dependent suburban development in the Kansas City metropolitan area. Each of these four study sites is evaluated in terms of *permeability, variety, and legibility*.

This thesis concludes that, while New Urbanist communities are more “responsive” than conventional suburban developments, they are not as “responsive” as a traditional urban neighborhood like Elmwood. At the same time, the study suggests the considerable value of *Responsive Environments* as an analytical tool to design and evaluate planned communities.

TABLE OF CONTENTS

LIST OF FIGURES	iv
LIST OF TABLES	vii
ACKNOWLEDGEMENTS	viii
CHAPTER 1	
INTRODUCTION: NEW URBANISM AND RESPONSIVE ENVIRONMENTS	1
Responsive Environments	3
CAPTER 2	
A REVIEW OF NEW URBANISM	8
Development of Modern American Suburbs	9
Lack of a Sense of Community	12
Traffic Congestion	13
Depletion of Nature	14
Architectural Blight	15
A Need for New Schemes	16
New Urbanism	17
Environmental Choice	17
Mixed land uses	18
Regionalism	20
Building Codes as a Means of Environmental Change	20
CHAPTER 3	
THE ECONOMIC AND SOCIOLOGICAL CRITIQUES OF NEW URBANISM	23
Economic Criticisms	24
Sociological Criticisms	30

CHAPTER 4		
	PLANNING, ARCHITECTURAL, AND BEHAVIORAL CRITIQUES OF NEW URBANISM	39
	Planning Criticisms of New Urbanism	39
	Architectural Criticisms	42
	The Behavioral Critique of New Urbanism	45
CHAPTER 5		
	DESCRIPTIONS OF THE FOUR STUDY SITES	49
	Kentlands – Traditional Neighborhood Design (TND)	50
	Laguna West – Transit-Oriented Development (TOD)	56
	Elmwood – Traditional Streetcar Suburb	65
	Four Colonies – Conventional Suburban Development	69
CHAPTER 6		
	REVIEW OF RESPONSIVE ENVIRONMENTS	76
	1. Permeability	78
	2. Variety	80
	3. Legibility	83
	The Four Responsive Environment Qualities Not Used for Evaluation	86
	Justifying the Use of Larger-Scale Responsive Environment Qualities Only	89
	Selecting the Study Sites	92
CHAPTER 7		
	PERMEABILITY AND THE FOUR COMMUNITIES	95
	1. Pathway system	96
	2. Street Patterns of the Four Communities	100
	3. Access Points	103
	4. Intersections	106

5. Aggregate street length	108
6. Number, size, and shape of blocks	112
Permeability and the Four Communities	121
CHAPTER 8	
VARIETY AND THE FOUR COMMUNITIES	125
1. Land use	126
2. Primary and secondary uses	133
Variety and the Four Communities	139
CHAPTER 9	
LEGIBILITY AND THE FOUR COMMUNITIES	144
1. Paths	148
2. Nodes	152
3. Landmarks	156
4. Edges	161
5. Districts	165
Legibility and the Four Communities	168
CHAPTER 10	
AN OVERALL EVALUATION AND THE PROSPECTS FOR NEW URBANISM	174
Evaluating the Four Study Sites	174
The Prospects for New Urbanism	178
References	184

LIST OF FIGURES

Figure 5.1	Traditional Architectural Design in Kentlands	51
Figure 5.2	Kentlands Site Plan	51
Figure 5.3	Elementary School in Kentlands	52
Figure 5.4	Mature Trees and Ponds in Kentlands	53
Figure 5.5	Restored Original Kent Homestead	53
Figure 5.6	Single-Family Detached House and Row Houses in Kentlands	53
Figure 5.7	Condominium in Kentlands	54
Figure 5.8	Sidewalk with Trees in Kentlands	55
Figure 5.9	Classical Revival and Federal Style Architecture in Kentlands	56
Figure 5.10	White Picket Fences and Front Porches in Kentlands	56
Figure 5.11	Laguna West Site Plan	58
Figure 5.12	Town Hall and a Church in Laguna West	58
Figure 5.13	Apple Computer Factory in Laguna West	58
Figure 5.14	Numerous Empty Lots in Laguna West	60
Figure 5.15	Waterfront in Laguna West	60
Figure 5.16	Single-Family Homes in Laguna West	61
Figure 5.17	Sense of A Late-Twentieth-Century Suburb in Laguna West	61
Figure 5.18	Three Axial Boulevards in Laguna West	62
Figure 5.19	Pedestrian-Friendly Environment in Laguna West	63
Figure 5.20	Rear Garage in Laguna West	64
Figure 5.21	Garage-Door-Dominant Streetscape in Laguna West	64
Figure 5.22	Elmwood District	65

Figure 5.23 Various Houses in Elmwood	66
Figure 5.24 Various Services in Elmwood	67
Figure 5.25 Mature Trees in Elmwood	68
Figure 5.26 Four Colonies Site Plan	70
Figure 5.27 Single-Family Attached and Detached Units in Four Colonies	72
Figure 5.28 Clustered Single-Family Homes in Four Colonies	72
Figure 5.29 Recreational Complex in Four Colonies	72
Figure 5.30 Berms in Four Colonies	73
Figure 5.31 Typical Building Type and Walkway in Four Colonies	73
Figure 5.32 No Sidewalks in Four Colonies	74
Figure 5.33 Walkways in Four Colonies	74
Figure 5.34 Extensive Fencing in Four Colonies	74
Figure 6.1 The Four Study Sites	93
Figure 7.1 Pathway System	97
Figure 7.2 Street Patterns	101
Figure 7.3 Access Points	104
Figure 7.4 Intersections	107
Figure 7.5 Aggregate Street Length	109
Figure 7.6 Blocks	114
Figure 7.7 Difference of Perimeter Length by Shape	118
Figure 7.8 Convex block and Non-convex block	119

LIST OF TABLES

Figure 8.1 Land Use for Four Study Sites	131
Figure 8.2 Primary and Secondary Uses	136
Figure 8.3 Distributions of Secondary Uses and LULUs in Kentlands	137
Figure 9.1 The Author's "Expert" Mental Maps of the Four Study Sites	146
Figure 9.2 Adjusted Mental Maps for the Four Study Sites	147
Figure 9.3 Probable Paths for the Four Study Sites	149
Figure 9.4 Probable Nodes for the Four Study Sites	153
Figure 9.5 Probable Landmarks of the Four Study Sites	157
Figure 9.6 Landmarks in Kentlands	158
Figure 9.7 Landmarks in Laguna West	159
Figure 9.8 Five Major Landmarks in Elmwood	159
Figure 9.9 Landmark in Four Colonies	161
Figure 9.10 Probable Edges of the Four Study Sites	162
Figure 9.11 Probable Districts of the Four Study Sites	166
Figure 10.1 Site Plan for Eastgate Town Center	179
Figure 10.2 Development Phases for Eastgate Town Center	180
Figure 10.3 Axial Map of Eastgate Town Center	181

AC LIST OF TABLES

Table 7.1	Distribution of Blocks by Size	116
Table 7.2	Distribution of Convex blocks and Non-convex blocks	119
Table 7.3	Rankings for Permeability	122
Table 8.1	Land Use for the Four Study Sites	129
Table 8.2	Rankings of the Four Study Sites for Variety	140
Table 9.1	Rankings for Legibility	169
Table 10.1	Rankings for Responsiveness	175

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Those from among you
Shall build the old waste places;
You shall raise up the foundations of many generations;
And you shall be called the Repairer of the Breach,
The Restorer of Streets to Dwell In (Isaiah 58:12, emphasis added).

CHAPTER 1

INTRODUCTION: NEW URBANISM AND RESPONSIVE ENVIRONMENTS

A new approach to the birth and revitalization of communities appeared in North America in the late 1980s. This movement, called New Urbanism, promotes developments based on towns formed prior to World War II, in which housing is mixed with retail, office and community space; residents are within walking distance to work and shops as well as to schools, hospitals, restaurants, theaters and community centers (Congress for the New Urbanism, 1999). New Urbanism is conscious about the aesthetics of the built environment as well as the social aspects of community. The focus is also on neighborhoods “where buildings of a unified architectural style form coherent public spaces where people see and interact with each other” (Seamon, 1997, p. 177). The movement strives to reunite the elements of contemporary life – housing, workplaces, shopping and recreation – into compact, pedestrian-friendly, mixed-use neighborhoods linked by transit and set within a larger regional open space framework (Congress for the New Urbanism, 1999).

In practice, the New Urbanist towns demonstrate “an implicit understanding of human nature and obvious logic. Bus stops are carefully placed within a five-minute walk of residential neighborhoods and places of employment; day-care centers and other services are sensibly positioned to meet peoples’ needs” (Dunlop, 1991, p. 110). New Urbanism is an alternative to

suburban sprawl, a form of low-density development that consists of large, single-use “pods” – office parks, housing subdivisions, apartment complexes, shopping centers – all of which are largely dependent on private automobiles (Congress for the New Urbanism, 1999).

There are two major types of New Urbanist development: Traditional Neighborhood Design (TND) and Transit-Oriented Development (TOD). Although their respective creators come from different backgrounds and political ideologies, there is a great deal in common between the two models, and they both have a strong environmental record (Kelbaugh, 1997).

TND started on the East Coast and grew out of Euro-American urbanism, which emphasizes traditional notions of city, town, type, and architecture. The pioneering authors of the concept are the architects Andres Duany and Elizabeth Plater-Zyberk, and they continue to develop and apply the concept around the United States and the world. TND is also referred to as “Neotraditionalism,” a term that embraces architectural as well as town planning concepts. Some Neotraditionalist characteristics are: small scale; mixed use; environmental sensitivity; internally consistent hierarchy of architecture, building, and street types; finite geometry with legible edges and centers; walkability; alleys with accessory dwelling units over garages; and reliance on succinct graphic guidelines instead of traditional zoning codes (Kelbaugh, 1997).

In contrast to the Neotraditionalist approach, TOD took root on the West Coast and arose from an energy and environmental design ethic. Architect Peter Calthorpe originally envisioned the concept and coined a phrase, “Pedestrian

Pocket,” or Transit-Oriented Development, which refers to a small, walkable community that mixes low-rise, medium-density housing for a variety of household types with retail, civic, recreational, and employment centers along a main street – all within about a one-quarter-mile radius of a central transit stop for a bus or rail system (Kelbaugh, 1997).

New Urbanism is a fast growing movement. Many of the developments, however, are still in the planning stage and up for discussion. In fact, of every dollar that is invested in New Urbanism developments, “an estimated \$1,400 goes into conventional real estate projects” (Chapman, 1998, p.1). Nevertheless, the movement has developed a diverse constituency including journalists, politicians, academics, planners, architects, developers, and the lay public (Shibley, 1998). Publications range from the popular media to academic and professional journals, yet the various critiques often seem to be unsettled and rather confusing as will be demonstrated in Chapters 3 and 4 of this thesis, which review these criticisms. To evaluate the movement, therefore, may be a timely and meaningful way to discern its future viability. Such an evaluation is a central aim of this thesis.

Responsive Environments

One approach to evaluating community developments is measuring the “responsiveness” of the environment, which is a concept developed by urban designers Ian Bentley, Alan Alcock, Paul Murrain, Sue McGlynn, and Graham Smith (1985). The concept starts from the idea that there are important

relationships between social life and the arrangement of the built environment, including architecture and urban design (ibid., p. 144). In their book, Bentley and his colleagues (1985) argue that responsive environments are "places that provide their users with an essentially democratic setting, enriching their opportunities by maximizing the degree of choice available to them" (ibid., p. 9). The authors identify seven design qualities that contribute to responsive environments: (1) *Permeability*, which is the ease with which people can get from one place to another in a district; (2) *variety*, which is the quality of a place that has different uses resulting in different building types and therefore attracting different people at different times of the day and night; (3) *legibility*, which is the quality that makes a place mentally graspable; (4) *robustness*, which is the quality of a place that can be used for many different purposes, thus offering its users more choices than places whose design limits them to a single fixed use; (5) *visual appropriateness*, which is the quality that creates visual meanings in people's minds; (6) *richness*, which is the quality that increases the variety of sense experiences which users can enjoy; and (7) *personalization*, which is a quality that describes how people can personalize existing environments.

These seven qualities imply as much "exchange of information, friendship, material goods, culture, knowledge, insight, skills" (Engwicht, 1992, p. 17) as possible easily available within a reasonable walking distance of where people live and work. Therefore, responsive environments involve "an attitude supportive of interaction and exchange," which one of the authors of the book, Murrain, later calls "interactive urbanism" (Murrain, 1993, p. 83). Day (1990)

argues that where different elements (e.g., people, things, and information) meet, there is rejuvenation (p. 28). In other words, a healthy community is characterized by interpersonal exchange (Seamon, 1997, p. 174). If interaction among people and “exchange of things and information” (Greenberg, 1995, p. 58) make a community, “responsive environments” have to be community-supportive environments. Since “community building and revitalization” is one of the major themes of New Urbanism, using the responsive environments qualities as a way for gauging the relative success of New Urbanist communities may be appropriate.

Besides the relation to “community,” New Urbanism and responsive environments have in common the desire to create a “democratic setting.” One of the founding figures of New Urbanism, Andres Duany, “calls [conventional] suburbia an ‘undemocratic’ system” (Leccese, 1988, p. 58) because he believes there is a lack of choice in suburban life. If New Urbanism is an alternative to suburbia or an “undemocratic system,” its goal may not be so different from creating “responsive environments.” In this sense, too, using the responsive environments qualities as criteria to measure the success of New Urbanism communities may make sense.

In order to assess the environmental responsiveness of New Urbanism development, this thesis evaluates four real-world communities – two New Urbanist developments, Kentlands and Laguna West; a small-block, high-density, traditional urban neighborhood, Elmwood; and a low-density, automobile-dependent suburban development, Four Colonies. These four communities will

be evaluated on the basis of three of the larger-scale responsive environment qualities of *permeability*, *variety*, and *legibility*. Four other qualities – *robustness*, *visual appropriateness*, *richness*, and *personalization* – are not evaluated here because they typically do not fall under the purview of planning and larger-scale urban design, which is the interest of the current researcher.

The two New Urbanist developments of Kentland and Laguna West were chosen because they are examples, respectively, of a sufficiently completed TND and TOD – the 264 acres of Kentlands and the 310 acres of Laguna West (New Urban News, 1997, September-October, p. 10-11). These developments are also quite comparable in characteristics, context, and time of construction. On the other hand, Elmwood is a traditional high-density, mixed-use community, which New Urbanists cherish and strive for, while Four Colonies is a low-density, automobile-dependent suburban development, which New Urbanists dislike and try to avoid. These two communities were chosen as benchmarks to see how New Urbanist communities are different from or similar to traditional and conventional suburban models. In other words, these two benchmark developments are used to show where the New Urbanist developments are situated in relation to today's two major contrasting forms of communities.

To evaluate the four developments in terms of responsive environment qualities, 125-acre circular units centered on the four developments' town centers were selected and evaluated by using specific measurements such as number of street intersections, size of blocks, location of land uses, potential movement flows among land uses, and so forth.

This thesis seeks to present one evaluation of the effectiveness of New Urbanism's design, using the responsive environment criteria as one evaluative base. At the same time, the thesis suggests a possible use of *Responsive Environments* as an analytical tool to guide future New Urbanism developments.

In presenting this evaluation of New Urbanism, the thesis discusses, in chapter 2, the birth of New Urbanism, its history, and its major design characteristics. Next, chapters 3 and 4 review criticisms of the movement, including economic, sociological, planning, architectural, and behavioral critiques.

Chapter 5 begins the empirical analysis of Kentlands, Laguna West, Elmwood, and Four Colonies by discussing the history and design of the four developments. Chapter 6 then discusses *Responsive Environments* in greater detail and presents how responsive environment qualities are used to evaluate the four study sites. Next, chapters 7, 8, and 9 are evaluations of the four sites, examining *permeability* (chapter 7), *variety* (chapter 8), and *legibility* (chapter 9), respectively. Finally, chapter 10 presents an overall evaluation of Kentlands, Laguna West, Elmwood, and Four Colonies and asks what this evaluation means for the development of other New Urbanism projects.

CHAPTER 2

A REVIEW OF NEW URBANISM

*Of all those ten thousand houses by the willowed river, fair sweet lady,
which is the little one you call home? – Li Po, Chinese poet, 701-762 A.D.*

The American suburb is both unique and indigenous. It is the “quintessential physical achievement of the United States” (Jackson, 1985, p. 4) and has been “a viable icon of personal achievement and independence” (Chakrawarti, 1996, p.53). Jackson (1985) distinguishes four elements of American suburbanization: (1) Low residential density and absence of sharp divisions between town and country; (2) a strong penchant for homeownership; (3) the socioeconomic distinction between the center and the periphery; and (4) the length of the journey-to-work both in miles and in minutes (ibid., pp. 6-10).

From a physical design standpoint, the American suburb can be described in terms of “minimum building coverage, maximum land for streets and sidewalks, look-a-like parking lots, inhospitable leftover spaces between building complexes, and an occasional park” (Chakrawarti, 1996, p. 59). Further, “the dwellings are conceived as isolated, freestanding pavilions, disjointed from the street and dominated by two- or three-car garages” (ibid., p. 53). Nevertheless, the suburb has been “the most dominant form in the shaping of mid-modern urbanization” (ibid.) in America.

Development of Modern American Suburbs

The suburb has long existed; “the earlier classic suburb was an exclusive turf for the wealthy and the upper classed” (Chakrawarti, 1996, p. 57). However, the promotion of the automobile in the 1920s opened the door for modern suburban expansion, and “new suburbs held out the promise of escape to all” (ibid.). For the first time, public money was spent for construction of highways to support private transportation. New attitudes toward the function of streets emerged; “most urban residents and virtually all highway engineers saw streets primarily as arteries for motor vehicles” (Jackson, 1985, p. 164). The public discussion on “Suburbanism” was more focused on means than on understanding what the ends might mean (Shibley, 1998, p.91). Of course, “A charter such as the one prepared by the New Urbanist was not required. ... Essentially [people] wanted to escape the evils of the city and that meant everyone needed a car” (ibid.). Many city streets had been taken away from people, and the streets have belonged to the autos since then. The new attitudes led to the creation of the highway system and forever changed the urban landscape: “Since the fifties American towns have been shaped by highways as they were once forged on rivers and railroads” (Leccese, 1988, p. 58).

This shift was accompanied by the structural separation between the suburb and the city. As suburbs expanded, business and employment opportunities moved to the outlying areas. As a result, “the suburb started depending less and less on the city for jobs and services, which gradually

changed the spatial content as well as the social and economic order of both the city and the suburb” (Chakrawarti, 1996, p. 57). The boundary between the urban center and the periphery had started to become blurred, and “the redistribution of urban vitality” (ibid., p. 53) contributed to the decline of downtowns all over America.

Probably, more than anything else, the suburban landscape of U. S. cities was promoted by the Federal Housing Administration’s (FHA) development standards and mortgage assistance in the 1930s. “The rationalization of financial and credit terms by a 1934 decision of the [FHA] paved the way for the suburban ideal to become democratic” (Chakrawarti, 1996, p. 57). Most people followed FHA standards in order to obtain the finances from FHA (Southworth et al, 1997, pp. 82-83). The following standards well describe typical suburban characteristics, and therefore, testify to their power to change the urban landscape:

- The subdivision layout should fit the topography of the site and take advantage of natural features.
- Not all streets should be designed for through or heavy traffic.
- Paving for streets bearing purely local traffic may be of inexpensive materials and may ... omit curbs and sidewalks.
- Width of paving should be based on allowance of 10 feet (3 m) for each traffic lane and 8 feet (2.4 m) for each parallel parking lane.
- All street intersections should be built on a radius of at least 20 feet (6m).
- Long-lived, hardy trees should be planted along all streets.
- Blocks should generally range from 600 to 1,000 feet (183-305 m) in length.
- A desirable lot for detached dwellings should be at least 50 feet (15.25m) wide, with an area of no less than 6,000 square feet (540 sq. m). For semidetached dwellings density should not exceed 12 units per acre (0.4ha) (Southworth et al, 1997, p. 83).

These standards were the result of the adoption of Neighborhood Unit and Garden City principles (Southworth et al, 1997, p. 80). The Neighborhood Unit was a scheme of arrangement for a family-life community that aims for a fractional urban unit that would be self-sufficient yet related to the whole (ibid., p. 68). The Garden City is designed to discourage traffic and keep it on the main thoroughfares (ibid., p. 45). These two ideas are based on “a cult of community” (Haworth, 1963) and a two-century-old agrarian-romantic notion¹. Therefore, ironically, *community* and *nature* were the suburb’s original aims.

Fueled by FHA support, the standardized suburb “was propagated at an astounding pace, especially between 1945 and 1970. While the population of central cities grew by 10 million, that of the suburbs grew by 85 million” (Chakrawarti, 1996, p. 57). However, the original suburban themes, *community* and *nature*, soon disappeared and unintentional byproducts – traffic congestion and architectural blight – became the new suburban themes.

¹ “Generations of writers have portrayed the city as impersonal, chaotic, by nature evil, and naturally conducive to social disorganization. In contrast, love for the rural landscape and attraction for the agrarian life style ... has always remained deep-rooted in the American mentality. The notion was founded on the concept of wholesome, independent country life” (Chakrawarti, 1996, p.55). Heckscher (1963) also describes this attitude saying, “American have been traditionally a rural people. Even when the center of their national life had shifted to the cities they continued to think as if the farms were their natural habitat and the source of their strength and virtue. Men kept the sense that they had recently come from the farm, or that one day they were going back to it” (in the preface to Haworth, 1963).

Lack of a Sense of Community

Perhaps suburbs have essentials to life such as light, air and space, but they may lack in community spirit. Community should include the exchange of things and information (Greenberg, 1995, p. 58) and interaction among people. Very often, however, modern suburbs have little of these qualities because they “reject the idea of the dense, closely-knit city, where everything is scaled to people” (Chakrawarti, 1996, p.59). The result is the lack in sense of community as Jackson (1985) describes:

A major casualty of America’s drive-in culture is the weakened “sense of community” ... [which] refers to a tendency for social life to become “privatized,” and to a reduced feeling of concern and responsibility among families for their neighbors and among suburbanites in general for residents of the inner city (ibid., p. 272).

Privacy is a great concern among suburbanites. The privacy may give people a sense of security, yet this attitude has in some instances gone too far and may have led to a rejection of interpersonal interaction. Nevertheless, at a deeper level, people crave real interaction, and that is why we use some kinds of entertainment such as music, radio, and phone while we are driving as Seamon (1997) argues; thus, “our life consists of being distracted” (ibid., p. 181).

Obsession with privacy led to the segregation by economic status because “one can always purchase privacy with money” (Thompson et al, 1975, p. 8). The condition of separation by class may not support a real community. This condition resulted from the escapism attitude; people escaped from cities’ crime, pollution, and crowded living conditions. However, the escape may only solve the problems temporally and superficially. In fact, the same problems such

as crime, pollution, and congestion can be observed in suburbs today. The irony is that the “drive-in culture” was promoted by suburban design, and this very design created the same earlier problem of traffic congestion.

Traffic Congestion

The new towns in modern suburbs are “designed exclusively for the efficient movement of the automobile and its convenient parking” (Duany, 1989, p. 60). Also the land use is strictly divided into residential, commercial and industrial sectors according to automobile efficiency, and they “are each located in separate parts of a development that in its entirety may cover hundreds or thousands of acres. Isolation is magnified by the typical street network – a curvilinear maze with nearly countless dead-ends” (Langdon, 1989, p. 72). Therefore, it is often “difficult for a person to get from one area to another except by private motor vehicle” (ibid.). This style of development ironically has created traffic congestion because it “offers few alternatives to driving for even simple errands” (Leccese, 1988, p. 58):

In the Los Angeles area, traffic speed is expected to drop by two-thirds to an average of 11 miles per hour by 2010. In areas of New York, suburban traffic congestion is reflected by the fact that newly registered autos have outpaced new residents by as much as ten to one. Traffic in California’s Bay Area increased 25 percent annually from 1982 to 1985, threatening the region’s economic prosperity. The cumulative effects of all this ignited fossil fuel pose even more troublesome environmental questions (ibid.).

Depletion of Nature

It can also be argued that suburban developments have helped to deplete the natural environment. Ironically, people used to believe that low-density development with large setbacks would save trees and land, and help preserve a town's rural character (Adler, 1995, p. 47; Lyman, 1992, p. 19). The residents were supposed to be able to view cornfields and natural woods in the distance from their homes; however, the view soon disappeared (Lyman, 1992, p. 21-22) due to further developments. The development rate was four to eight times faster than the population growth. For example, "the population of the New York City metropolitan area over the past 25 years has increased only 5 percent, but the developed land has increased by 61 percent, devouring nearly a fourth of the region's forests and farmland" (Peirce, 1993, p.2326). This of course affects the habitat of birds, animals, and other living creatures (Boucher, 1995, p. 17; Stein, 1993, p. 42). Moreover, air pollution caused by extensive automobile use in suburbs is the prime suspect of the tree growth reduction in California (Forstenzer, 1994, p. 16). Schroeder (1990) warns about the suburban attitude towards nature:

Manipulation of the natural environment for human benefit is necessary and appropriate to a point. But if this attitude is carried too far we lose our awareness of what it means to be in a non-manipulative relationship with nature... When we are unable or unwilling to take delight with things that are not under our control, we become domineering and manipulative toward our environment, caring only about benefits that can be justified in scientific and economic terms. Our economic calculations then lead us to replace trees and forest with roads, parking lots, and buildings. We pay a heavy price in terms of increased stress, alienation from our environment, and inability to relate to anything outside our narrow egocentric goals. We continue to pay this price because so many of us are unaware of what we are losing (ibid., p.38).

In many ways, people may have lost their sensibilities to nature and do not have much attention to the environment any longer (Day, 1990, p. 11). Without recognizing what they are losing, people further have developed a habit of coping by being distracted by entertainment (Seamon, 1997). And this insensibility may be one of the reasons for the architectural blight in suburbs.

Architectural Blight

Architectural blight is also a regular characteristic of the modern suburbs. This is mainly because “the tract house was the most likely option” for most families, and the number of styles was very limited (Jackson, 1985, p. 239). Nevertheless, those similar styles “tended to find support throughout the continent, so that ... the casual suburban visitor would have a difficult time deciphering whether she was in the environs of Boston or Dallas. ... [Those houses] had no hall, no parlor, no stairs, and no porch. And the portion of the structure that projected farthest toward the street was the garage” (Jackson, 1985, p. 240). Chakrawarti (1996) also describes the situation rather sarcastically:

Its countless imitators, with its concomitant emphasis on strained inventiveness, meretricious beauty, and riotous originality manifested in an enormous variety of building forms, each one a fatuous parody of the Palladian villa, the Swiss chalet, the French provincial mansion, the New England cottage, the ranch house, the split-level bungalow, and the Spanish casa (ibid., p.59).

A Need for New Schemes

As Day (1990) argues, developers' emphasis on mass construction methods and profit over care (ibid., p.8) may be a reason for the suburban landscape in America. FHA's mortgage assistance also had encouraged overly uniform streetscapes. If aesthetically satisfying environments are physically healthy (Day, 1990, p. 21), are suburban developments healthy? The street designs have been encouraging excessive use of automobiles. This in turn has created traffic congestion and resulted in air and noise pollution that was once only a problem of the central city. Nevertheless, "the general environmental syndrome that the problem is 'not in my yard'" (Cary, 1993, p. 563) seems to be prevalent, and people seem to be quite content with their suburban environments. Or they may be desensitized by a blighted environment resulting from the habit of being distracted by entertainment (Seamon, 1997).

The last 30 years of suburban population growth may be the result of people's attempts to escape from cities to suburbs and from suburbs to new suburbs. Continuing suburban sprawl today questions the viability of current suburban schemes and may be evidence of the lack of a sustainable environment. The history of suburban development may continue with the repetition of the status quo until the creation of sustainable communities or the exhaustion of natural lands. New Urbanism has developed in this climate as a new suburban scheme.

New Urbanism

New Urbanism diametrically opposes conventional suburban development:

[In modern suburbs], the concept of self-contained neighborhoods, the integration of social values, the weaving of open spaces into the fabric of the town, the cohesion of buildings, streets, and squares reflection the sense of enclosure, the notion of community legibility and civic identity, the symbolic power of buildings, and the sublime presence of spaces are all forgotten principles of design and planning (Chakrawarti, 1996, p.59).

New Urbanism seeks to reclaim those principles, and thus, is a reaction against modern American suburban development. Interestingly enough, the original suburban themes – *community* and *nature* – are also two basic themes of New Urbanism (Congress for the New Urbanism, 1999). In this sense, New Urbanism is also an attempt to recapitulate the original American *suburban* ideal but in a new way. In this sense, the movement is as uniquely American as the conventional American suburb.

Environmental Choice

The philosophy behind New Urbanism is a return to a more democratic urban form. New Urbanism proposes more choices as opposed to conventional suburbs, and thus, theoretically promotes a more democratic environment. In a conventional suburb, “there is no choice [of transportation] but to use [the automobile]” (Duany, 1989, p. 60). This one “no-choice” ends up even more as “no-choices” such as how one interacts with other people on the road, when

children can go and leave school, and how children spend time after school.

Duany (1989) explains:

Contact among fellow citizens is actually an aggressive, competitive, automotive contact under high stress for position on the highway and this is the only option. ... [Moreover,] there is no place to live where the kids can be on their own to go their classes, to visit their friends. They must be driven to visit friends. ... The only other option, and one frequently taken, is to affix the kids to the television set as surrogate entertainment. This is not without its harmful effects. ... There's no public realm, there's no street life, [and] there's no social life (ibid., pp. 60-61).

When there is only one choice, a person who cannot afford that choice is automatically excluded from the system. For that person, his/her freedom is severely curtailed. As a result, this suburban "undemocratic" system reduces children, seniors and the poor to "urban orphans" (Leccese, 1988, p. 58).

Mixed land uses

In order to make the suburban environment more democratic, New Urbanism works to create a fine-grain, mixed-use community with pedestrian-friendly streets. New Urbanism is based on the acknowledgement that "people hate walking in parking lots, and they love walking past buildings" (Dunlop, 1990, p. 83). The idea is supported by researchers such as Clare Cooper Marcus (1989) who reports: "Studies show that people who have to walk a hundred [feet in parking lots] are willing to make a trade-off with 200 feet to their car [in mixed-use] because they understand that what they're getting in return is a nice landscaped space where their kids can play and they can walk" (ibid., p.88).

To better integrate automobiles, on-street parking is common in the New Urbanist town. This arrangement slows traffic down, so it is another benefit for pedestrians (Langdon, 1989, p. 73). People can drive and park on the street, and this fact “contributes more to ambience and space definition than convenience” (ibid.). Architectural considerations are also input to New Urbanist design. For example, “many offices sit ‘above the shop’ in brick buildings designed to recall early-20th-century commercial architecture” (Leccese, 1988, p. 58).

Another input element of New Urbanist design – mixed land use – also has a singular impact in solving the traffic congestion by bringing the places people live and work together. This encourages people to use alternative transportation other than automobiles. Along with mixed land use, a grid street pattern in the town gives people choice and can help relieve traffic congestion since it is “partially caused by the dead-end web of cul-de-sacs pouring onto overloaded main roads” (Leccese, p. 58, 1988).

As far as future developments are concerned, New Urbanism tries to retain fine-grain land use “by basing all lots on a common multiple” of 22 feet, and this land plan allows for choice in the type of housing built at any one time. “If after a year market demand is highest for small detached homes, builders can combine lots to build this type of housing” (Pearson, 1988, pp. 82-83).

Regionalism

As opposed to the anonymity of conventional suburbs, New Urbanist design seeks its own uniqueness according to regional geography and history. One of the founding figures, Plater-Zyberk, argues that “everybody wants a strong neighborhood identity in compensation for the universalization of culture in the 20th century” (Dunlop, 1991, p. 110). Therefore, architectural codes vary from town to town based on historic styles and the local vernacular. “The codes are tightly drawn, but ... there is room for individual invention. Each new town poses its own peculiar challenges of ecology, economics, and education. In California, Nance Canyon was designed around the idea of luring the research and development industry; in Florida, the 2.5-square-mile town of Wellington will have a satellite campus of Florida Atlantic University” (ibid., p. 112).

Building Codes as a Means of Environmental Change

Against the popular postmodern notion that rejects any standards, New Urbanism believes that design should be locked in through strict codes. “Every square inch of it, including the size of the bushes in the parking lots, was specified by the codes” (Duany, 1989, p. 62). The movement aims at changing planning policies by writing new codes and regulations that towns must abide by in legal implementation (Dunlop, 1990, p. 82). The logic of code use may be this. If modern suburbs had been created by legislated codes, they might have enormous power over development. In fact, “Planners have the power to make architects and engineers and developers do exactly what they want” (Duany,

1989, p. 62). Therefore, creating different kinds of developments may be possible by using different kinds of codes.

There are two types of New Urbanism codes. “The first code makes sure that the materials and design elements in each building are harmonious; the second regulates the way buildings relate to each other and to their environment” (Pearson, 1988, p. 82). A typical code might indicate the proportionate relationship of street to building such as “the Renaissance standard of six-to-one that tall trees must line the sidewalk to compensate” (Dunlop, 1991, p. 112). Along with this, “every town plan includes a detailed landscape code and a litany of allowable building types” (ibid.). This latter element is critical. “The philosophy here is that urban design comes directly from knowing about building types,” says Plater-Zyberk (ibid.). She further warns, “if you don’t think in those terms, of types, the buildings become blobs” (ibid.). In the design process, “the collaborative spirit is employed to guarantee diversity; nevertheless, the planners’ codes are strong enough to guard against absurd gestures” (ibid.). In the New Urbanist way of thinking, “there is no such thing as an isolated act of architecture” (ibid.).

In a sense, New Urbanism is creating “pattern languages” (Alexander, 1977), which are founded in successful towns. For example, Duany and Plater-Zyberk say, “The most important aspect of the center of town is the commercial district” (Dunlop, 1990, p. 82), which can be seen as a pattern. It is no coincidence that Duany and Plater-Zyberk (1995) calls, *A Pattern Language*, the “equivalent to Bible.” Beneath it all is the belief that there’s a right way to do

things, and the success all depends on good design. (Dunlop, 1991, p. 110). And the approach is “not just a design to excavate the way of the past ... it’s not nostalgia” because there are structural objectives met by the New Urbanist approach: trip shortening, multiple uses, a de-emphasis of the automobile, and open-space planning. These are “period- and time-neutral” (Leccese, 1988, p. 64).

Nonetheless, the movement has developed a diverse constituency including journalists, politicians, academics, planners, architects, developers, and the lay public (Shibley, 1998). Publications range from the popular media to academic and professional journals, yet the various critiques often seem to be unsettled and rather confusing. The two following chapters of this thesis, therefore, review criticisms of New Urbanism, including economic, sociological, planning, architectural, and behavioral critiques.

CHAPTER 3

THE ECONOMIC AND SOCIOLOGICAL CRITIQUES OF NEW URBANISM

For a number of reasons, New Urbanism has invited a diverse criticism, which appears in both the popular media and academic and professional journals. The New Urbanists' attempt to be "whole" includes a wide range of "political, economic, behavioral, and physical-environmental systems" (Steiss, 1974). Shibley (1998) explains that "In constructing a broad constituency of government, business, academic, professional, and lay public, the New Urbanists have stepped outside the formally sanctioned and reified worlds of each constituent type as a center for discussion for doing the 'right thing' about community making" (ibid., p.91). The movement's invasion of so many sanctioned territories has often caused uneasiness among academia and other professions, which has often led to a negative reaction.

Another reason for the considerable amount of criticism of New Urbanism may be conventional American attitudes about suburbia. If "housing is an outward expression of the inner human nature," as Jackson (1985, p. 3) argues, New Urbanism's assault on the contemporary suburb is a challenge to the nature of American contemporary culture. This is because the modern suburb is a "manifestation of such fundamental characteristics of American society as conspicuous consumption, a reliance upon the private automobile, upward mobility, the separation of the family into nuclear units, the widening division between work and leisure, and a tendency toward racial and economic

exclusiveness” (Jackson, 1985, p 4). These characteristics also have been the very essence of the American dream. In this sense, New Urbanism asks people for a radical paradigm shift – the implication is a dramatic resettlement of America, which may cause discomfort and reaction.

Most broadly, the criticisms of New Urbanism can be said to be fivefold: (1) economic; (2) sociological; (3) planning; (4) architectural; and (5) behavioral. In this chapter, I present economic and sociological criticisms, then in chapter 4, I discuss planning, architectural, and behavioral criticisms.

Economic Criticisms

Some economists criticize New Urbanism, saying it is “tampering at the margins of urban problems” (Gordon et al., 1998, ¶ 1, part II). They criticize the New Urbanist’s claim that the movement is a complete solution to metropolitan problems. They point out the absence of concrete details in the New Urbanists’ discussions as to how they will influence the future metropolitan region (ibid.). However, these critics see New Urbanism as a set of public policies relating to much larger geographical and economical regions than envisioned by New Urbanists. Therefore, these critics claim that New Urbanism is insignificant in terms of population absorption, and “the practical consequences of New Urbanism continues to be a small number of relatively small communities accommodating a miniscule proportion of metropolitan population growth” (ibid., ¶ 5, part I). Moreover, the movement “would do little to change the metropolitan landscape” (Downs, 1994, cited in Godon et al., 1998, ¶ 5, part I) because “the urban capital

stock is already largely in place and changes very slowly” (Gordon et al., 1998, ¶ 5, part I).

The same critics also say that New Urbanism is irrelevant to urban problems because it is “based on a false diagnosis of society's urban problems, [and] an excessive faith in the ability to change the world” (Godon et al., 1998, ¶ 4, part I). Accordingly, “the real problem for the central city and the stability of its economic base is how to counter or accommodate the obvious decentralization of agglomeration economies to the suburbs and to edge cities” (Garreau, 1991, cited in Gordon et al., 1998, ¶ 3, part III), or “even the possibility that such economies are disappearing” (Gordon et al., 1996, cited in Gordon et al., 1998, ¶ 3, part III). Yet, “New Urbanism has nothing to contribute to this discussion, in part because it believes, at least implicitly, that social problems are remediable by architectural and design prescriptions rather than by economic development” (ibid.).

New Urbanism does claim importance for the physical environment but does not claim to be a complete panacea for economic ills. In fact, the Charter of New Urbanism says, “We recognize that physical solutions by themselves will not solve social and economic problems, but neither can economic vitality, community stability, and environmental health be sustained without a coherent and supportive physical framework” (Congress for the New Urbanism, 2000, ¶ 3). It may “be simplistic to expect a dissolution of these problems by physical planning interventions” (Godon et al., 1998, ¶ 2, part I), however, it also is simplistic to expect

everything to be converted to economic development, which Godon et al. (1998) believe, at least implicitly.

Admittedly, New Urbanism is silent on such issues as “how the role of agglomeration economies is transformed by information technology and other developments” (Godon et al., 1998, ¶ 2, part III). However, it may be too much to ask of the New Urbanists because economists themselves really cannot tell what will happen to agglomeration economies in the future. While it is true that New Urbanism is silent about the issue, many economists are also uncertain. As one economist explains,

Technological change is ongoing. The same technology that has altered the competitive landscape in favor of metropolitan areas with employment in the 750,000 to 1.5 million range may alter conditions further in the future to the advantage of other kinds of metropolitan areas. Agglomeration benefits are not fixed; the list of winners and losers will continue to evolve (Horst, 1998, ¶ 17).

Nevertheless, the economic critics have a strong point because the location of past economic opportunities largely dictates the population density of an area today and not the other way around as New Urbanism implies (Speare et al., 1990). In this vein, Harvey (1997) bluntly argues:

New Urbanism cannot get to the crux of urban impoverishment and decay. When jobs disappear, ... the whole fabric of sociality is torn asunder, making invocations of community and traditional neighborhood districts ... seem irrelevant to the fate of the "new" American metropolis actually forming all around us. In the absence of employment and government largesse, the "civic" claims of the New Urbanism sound particularly hollow (ibid., ¶ 4).

Gordon et al. (1998) criticize the New Urbanists' partial account of the economy. These critics say that the New Urbanists “have paid excessive attention to the costs side of alternative settlement patterns” (¶ 1, part II). They point out the

fact that most people are not “cost minimizers.” Instead, people “trade off costs for perceived benefits” (Gordon et al., 1998, Fall, p.23), and the assault on suburbanization (“sprawl”) by the New Urbanists undermines the dominant characteristics of economic growth, which many New Urbanists would regard as a good thing (Gordon et al., 1998, ¶ 10, part II).

According to these economic critics, suburban growth is the result of a trade-off between the benefits of agglomeration and congestion costs. Therefore, spatial growth naturally exceeds population or employment growth because dispersed employment flattens the price curve and does not raise housing prices; thus, more consumption of space is prompted. Moreover, footloose industries are now able to follow the labor force (Easterlin, 1998, cited in Gordon et al., 1998). “With this new freedom, workers and their families choose suburban high-amenity low-rent sites” (Gordon et al., 1998, ¶ 7, part II). Further, these critics assert that agglomeration economies are most attractive in the suburbs.

In this sense, agglomeration economies¹ are important for small start-up firms that are unable to benefit from scale economies. Such firms were traditionally located in the cores of urbanized areas, trading off high land costs for external agglomeration benefits. However, the economic critics say that the location of agglomeration benefits exists in the outer suburbs today, which is suggested by the changing location of rapid growth. In fact, metropolitan-area private sector

¹ “For an industry, the benefits of locating in a densely peopled and highly industrialized situation. The market is large, but concentrated in a relatively small area. Transport costs are therefore low, so that many specialized industries can evolve, since local demand is sufficiently high. Further benefits arise because of functional linkages, and through external economies. However, when land costs and congestion are high, these agglomeration economies may be offset to such an extent that decentralization begins to set in” (Mayhew, 1997).

employment growth is strongest in the suburbs. Thus, critics claim, "If cities want to prosper, then employment growth in their suburbs is to be welcomed. If suburban expansion is inevitably linked with sprawl, there are clearly serious risks in anti-sprawl actions" (Godon et al., 1998, ¶ 11, part II).

Advances in technologies may indeed eliminate traditional agglomeration economies for some industries but not all (Horst, 1998). Thus, the critics' claim may not be totally correct, and large metropolitan areas will remain, since rapidly changing technology and markets require more cooperation and communication between firms and flexibility on the part of workforces, which is enhanced more in large metropolitan areas (ibid.): "High value added, specialized, non-routine activities remain in large metropolitan areas. Low value added routine activities are moving to smaller lower cost metro areas" (ibid., ¶ 10).

Finally, "It is very difficult to establish an accurate estimate of the net balance of these [cost and benefit] factors, because so many components are unmeasured" (Speare et al., 1990, ¶ 28). For example:

Other important aspects of the costs and benefits of cities may be viewed from the social side. These include the relative distribution of income (or more generally resources) for urban areas, crime, anti-social behavior, and racial and ethnic conflict. In some sense these are also externalities or agglomeration diseconomies, just seen through a sociological or psychological lens (ibid. ¶ 26).

Another group of economic critics call New Urbanism, "interventionist" (Gordon et al., 1997), and argue that there is no need for the new movement because the market for housing is self-regulating and doing fine (Shibley, 1998, p. 86). These critics' agendas are promotion of "markets, property rights, incentives, and decentralized decision-making" (Cascade, 1997). For them, the

problems of sprawl do not exist. The group is anti-government and anti-regulation; whatever comes from any authorities becomes a target of harsh criticism based on their distrust. Since New Urbanism has received endorsements from federal agencies such as the Department of Transportation, the Environmental Protection Agency, and the Department of Housing and Urban Development (O'Toole, 1999), the strict planning codes provoke these critics' complaints.

One of the critics argues that only the community's desire, namely the "market", can achieve the New Urbanist's goals but not planner's. The critic says that the people do not have the kind of desire in the first place citing a financial failure of one New Urbanist development, Laguna West (O'Toole, 1999).

However, citing only one example of failure is a superficial way to describe the entire movement. In fact, there are financially successful developments such as Seaside and Kentlands – for example, "Seaside was a huge hit with the public – lot prices [have] risen more than tenfold since 1982 "(Morgenthaler, 1993, p. A1). In Kentlands, "People are willing to pay a premium to live [there] ... [Obviously,] Kentlands is selling something people want" (Marshall, 1996, p. 102).

Moreover, there is some emerging evidence of market support: "Loft housing is appearing in downtowns; prices for houses in many older, complex, mixed-use neighborhoods (the ones that are models for New Urbanism) are rising rapidly. At the same time, prices for conventional houses on many metropolitan fringes are increasing only minimally" (Leinberger, p. 36, 1998).

These critics' assumptions about human behavior are greatly different from the New Urbanists; these critics believe that people's behavior, such as an auto-dependent life style, cannot be changed. Not surprisingly, these critics are supportive of suburban sprawl, which New Urbanists disdain the most. This camp of critics consists of conservative policy groups dedicated to the principles of free enterprise, individual liberty and limited government. These critics include: (1) private "property rights" organizations, (2) free market think tanks, and (3) home builder and development interests. Most broadly, these critics argue that growth-control efforts interfere with free market mechanisms, and building and real estate development interests claim that consumer preferences should determine sprawl-type development patterns, not builders (Sprawl Watch Clearinghouse, 1999).

This last group of critics emphasizes a laissez-faire attitude based on a firm belief in freedom of the individual and the free market. They, therefore, react against any regulations including the idea that suburban development should be predetermined in any way including on the basis of New Urbanist requirements and regulations.

Sociological Criticisms

There is another set of critics who see New Urbanism through sociological lenses. One of these critics sees New Urbanism as an escapism, saying that New Urbanist developments demonstrate a "reluctance to genuinely engage the euphoric chaos of urban life" (Ouroussoff, 2000, p. 82). According to this critic,

the New Urbanist developments "are communities shaped by the desire to escape urban chaos and suburban isolation... [and rejecting] the historical role of the metropolis as a place of cultural frictions. ... Traditional streetscapes serve as symbolic barricades against a world in constant social flux" (Ouroussoff, 2000, pp. 6, 82). Similarly, Kreiger (1998, ¶ 10) says that "The appeal of [the developments] is a yuppie flight phenomenon," and Willis (1999) argues that "The movement's idealized communities seem most effective as retreats from, not solutions to, late-capitalist development" (ibid., p.170). In fact, the New Urbanism has been able to maneuver within the current social system without any damages to the existing power structure (Shibley, 1998, p.93; Willis, 1999, p.170). As Sennett (1986) explains,

The celebration of territorial community against the evils of impersonal, capitalist urbanism quite comfortably fits into the larger system, because it leads to a logic of local defense against the outside world, rather than a challenge to the workings of that world.... And this is why the emotional logic of community, beginning as a resistance to the evils of modern capitalism, winds up at a bizarre kind of depoliticized withdrawal; the system remains intact, but maybe we can get it to leave our piece of turf untouched (ibid., pp.295-6).

Similarly, Harvey (1997) warns that the movement's "refusal to confront the political economy of power, blunts its revolutionary potential" (ibid., ¶ 13) because the result of New Urbanism is "to acquiesce to those [economically privileged individuals and groups] imposed by uncontrolled capital accumulation, backed by class privilege and gross inequalities of political-economic power" (ibid., ¶ 12). Other critics further argue that the New Urbanist developments bolster existing structures of class, gender, and racial domination (Falconer Al-Hindi et al., 1997, pp. 350-351) and also "reinforce existing social and spatial divisions, promote

reactionary and exclusionary territorial identities, and legitimize the status quo" (Till, 1993, p. 709).

There is also a line of criticism involving the exclusiveness of the New Urbanist communities. Willis (1999) says:

The modern sense of community "seems to be about fraternity in a dead, hostile world." Yet there is an unfortunately small space to be traversed between fraternity and xenophobia. The nostalgic wish to retreat from the impersonal modern world can lead to a romanticization of the gated compound, the ghetto, of blood, or of race (ibid., p.170).

The argument is also that the attitude of escapism leads to segregation and a "self-contained community" (Ouroussoff, 2000, p. 82). Perhaps, for that reason, there is little evidence that the New Urbanist communities have achieved their goals of income diversity and racial mixing (Godon et al., 1998). In fact, according to Gordon et al. (1998), the communities are turning out to be rather elitist settlements with average income levels much higher than in the surrounding areas. For example, Marshall (1996) reports that one of the developments, the Kentlands, is very exclusive as opposed to the declared egalitarian banner of New Urbanism. It "attracted the white upper-middle class cream of the metro area's crop" (ibid., p. 102).

Till (1993) argues the New Urbanists' marketing strategy promotes an exclusionary sense of territorial identity (ibid., p. 720), and this segregated social cohesion and community identity "validates a system which destroys the possibility of establishing the 'bonds of authentic community' in the first place" (ibid., pp. 729-730).

Also according to Till (1993), New Urbanist communities are intrinsically exclusive because the promotional materials, marketing analyses, and design guidelines are aiming for middle-class regional markets; the consumers are familiar with and most likely to expect a certain architectural and community style (ibid., p. 718, p. 729). In this sense, economic means, namely the high property price range, mediate the access to even the “public” spaces in the developments (Falconer Al-Hindi et al., 1997, p. 366).

Other critics argue that the location of developments is also a result of the marketing strategy, and, in effect, circumvents direct confrontation with others different from a well-to-do middle-class population. Thus, gates and guards are largely unnecessary although the facts are offered as evidence of its non-exclusivity (Falconer Al-Hindi et al., 1997, p. 363).

Accordingly, the communities are said to be socio-culturally “homogenous demographic enclaves” rather than “rainbow coalitions” (Kreiger, 1998, ¶ 9; Falconer Al-Hindi et al., 1997, p. 362) and end up as “a group of carefully screened citizens with shared values” (Ouroussoff, 2000, p. 82). These critics also assert that “The community is ideally emplaced to avoid confronting race and class issues directly, and to play upon white middle-class prejudices and fears” (Falconer Al-Hindi et al., 1997, p. 363).

These same critics suggest that the claims of the New Urbanists to have recreated a truly democratic public sphere will be severely compromised because of the de facto privatization of an autonomous public realm caused by its exclusiveness (Falconer Al-Hindi et al., 1997, p. 362, p. 365). Further, they

argue that the New Urbanists' conception of democracy itself is limited; thus, the movement seeks to reassert only a highly restricted sense of public space, which removes altogether from a broader public. This is said to be so because the New Urbanism is part and parcel of contemporary reactionary conservative trends, which employ a culturally reactionary trope of retrenchment, security, and inwardness (Falconer Al-Hindi et al., 1997, p. 364-365, p. 369). Thus, these critics argue that the similarity between the New Urbanists and urban thinkers such as Jacobs (1961) is only superficial. Nonetheless, critics say the New Urbanists profess a certain egalitarianism and act as if creating an emancipatory urban landscape, which is found in their arguments about the affirmation of social diversity, the revaluation of a "politics of difference," and a reemphasis on community-based local planning (Falconer Al-Hindi et al., 1997, p. 364-365).

Furthermore, Gordon et al. (1998) assert that there is no identifiable relationship between the New Urbanist communities and the fate of those who live in central cities. Shibley (1998) comments that "New Urbanism will make the dominant wealthy, middle and professional classes even more comfortable with their abandonment of the inner city and the conditions of poverty and exclusion because they are a part of a new and exciting movement" (ibid., p.93). Symbolic belief that these classes are doing the right thing works as an indulgence for them (Cary, 1993). Harvey (1997) also claims that New Urbanism "builds an image of community and a rhetoric of place-based civic pride and consciousness for those who do not need it, while abandoning those [less able economically] to their 'underclass' fate" (ibid., p. 69). As a result, the movement is "perpetuating a

rather middle-class notion of the good life" (Kreiger, 1998, ¶ 10) and "legitimizes territorial boundaries and regional identities as being normal" (Till, 1993, p. 710).

LaFrank (1997) is cautious about reintroducing traditional planning concepts today because they "may also serve to revive the image of a less conflicted past, one in which social hierarchies were more acceptable and inequities more willingly tolerated" (ibid., p. 116). Similarly, Willis (1999) is apprehensive about "the nostalgic withdrawal advocated by communitarianism (the philosophical movement most closely allied with new urbanism) [because it] risks replicating some of the least desirable communal aspects of vernacular societies" (ibid., p. 170). In the same vein, Harvey (1997) warns:

"Community" has ever been one of the key sites of social control and surveillance bordering on overt social repression. Well-founded communities often exclude, define themselves against others, erect all sorts of keep-out signs (if not tangible walls). ... As a consequence, community has often been a barrier to rather than facilitator of progressive social change, and much of the populist migration out of villages (both rural and urban) arose precisely because they were oppressive to the human spirit and otiose as a form of socio-political organization. ... All those things that make cities so exciting--the unexpected, the conflicts, the excitement of exploring the urban unknown--will be tightly controlled and screened out with big signs that say "no deviant behavior acceptable here."... No matter: the idea of the urban village or of some kind of communitarian solution to our urban ills worms its insidious way into public consciousness, with the "New Urbanism" as one of its forms of articulation (ibid., ¶ 11).

As defined by the French philosopher Bourdieu (1990), habitus is a "system of acquired dispositions functioning on the practical level as categories of perception and assessment or as classificatory principles as well as being the organizing principles of action" (quoted in Lawley, 1994, ¶ 22). Some critics are uncomfortable that New Urbanism reproduces a certain style of habitus. These

critics say that, while seeming to reject the invidious characteristics of urban modernism, New Urbanism perpetuates a largely modernist bourgeois habitus (Falconer Al-Hindi et al., 1997, pp. 350-351), thus, reproducing the lifeways of relatively wealthy and footloose housing class (ibid, p.358).

These critics say that the New Urbanists seem to succeed in creating enclaves of New-England-style communitarianism, which is likely to be as much a result of resident self-selection as it is of assumptions and visions of the designers themselves (Falconer Al-Hindi et al., 1997, p. 358). These critics argue that there are unavoidable connections between a resident's identity (white, heterosexual, and wealthy) and the modes of visibility in the developments (ibid, p. 362). Residents are always acting within the domain of habitus because they must conform to the New Urbanists' notion of urban place in order to live in the community (ibid, p. 358).

Other critics believe that New Urbanist physical design is controlling (Falconer Al-Hindi et al., 1997) because it can "ensure social control and regulate social interaction" (LaFrank, 1997, p. 116). For instance, Falconer Al-Hindi et al. (1997) argue that access to the developments is "mediated by one's identification", and the visitor who is "different" "will find himself or herself under constant and subtle forms of surveillance" (ibid., p. 367-368). These critics also say that there is a striking preoccupation with visibility in the New Urbanist developments, and their overly visible public spaces colonize private spaces. For example, the interiors of private houses become showcases of "types" and "examples" of good taste or successful living. Moreover, these critics argue that

the notion of autonomous citizenship is undermined by the New Urbanists' administrative impulse: "This is in keeping with the turn-of-the-century small town fantasy that informs the community's design; groups control their members, whereas individuals may threaten the social order with, for example, 'uncoded' behaviours" (ibid, p. 363).

Harvey (1997) wonders if New Urbanism "perpetuate[s] the idea that the shaping of spatial order is or can be the foundation for a new moral and aesthetic order... it presupposes that proper design and architectural qualities will be the saving grace not only of American cities but of social, economic, and political life in general" (ibid., ¶ 5). Other critics also say that the New Urbanists seem to "end up by replacing one form of architectural determinism (high modernism) with another" (Falconer Al-Hindi et al., 1997, p. 369). They say that the New Urbanists' "planning principles contain more than a hint of spatial determinism" (ibid, p. 356) and they warn that such developments are "dangerous diversions from the search for genuine solutions to real urban problems" (ibid, p. 369). Kreiger (1998) also points out the movement's deterministic tendency, arguing that while the New Urbanists are "ardent critics of Modernism", their claim is oddly modern for it is a "form-follows-function determinism ... implying that community can be assured through design" (ibid., ¶ 9). He asserts that the image of community does not necessarily mean the community itself. Falconer Al-Hindi et al. (1997) point out that there is an implicit assumption of social voluntarism, which claims "to be able to mold ex nihilo a new urban form in response to the problems of urban modernity" (ibid., p. 356).

In broadest terms, economic critics' concerns are mainly with the economic viability of New Urbanism and its contribution to urban economic growth, while sociological critics are concerned with the social class structure and the possible exploitation of certain classes by others. In the next chapter, I review planning, architectural, and behavioral criticisms.

Planning Criticisms of New Urbanism

Both critics see New Urbanism's physical design through a typical prism: "the spatial form and function." In Sawinowitz's (1995) view, "the urban form of New Urbanist developments... [is] correlated... with... suburban developments" saying, "Like other suburbs, the new urbanist models are essentially anti-urban sanitized versions of the small town and exclude much of what it takes to make a metropolitan region work" (p. 103). They also explain that one of the problems is the projects' weak connections with the

CHAPTER 4

PLANNING, ARCHITECTURAL, AND BEHAVIORAL CRITIQUES OF NEW URBANISM

The economic and sociological criticisms in the previous chapter arise largely from outside the design field and, as we have seen, many of these criticisms reject New Urbanism as a false diagnosis of urban problems. This chapter, in contrast, presents critiques that are more directly related to design issues, including planning, architectural, and behavioral evaluations. Many of these critics share a similar perspective on urban problems with the New Urbanists but question the viability of New Urbanism by critiquing its methods of solving social problems or by pointing out potential planning and design problems. Overall, we shall find that this body of criticism is more constructive than the economic and sociological critique reviewed in the preceding chapter.

Planning Criticisms of New Urbanism

Some critics see New Urbanism's physical design through a typical planner's viewpoint: land use function. In Southworth's (1995) view, there is little urbanity in New Urbanist developments. He equates them with conventional suburban developments saying, "Like other suburbs, the neotraditional models are essentially anti-urban sanitized versions of the small town and exclude much of what it takes to make a metropolitan region work" (ibid., p. 36). Then he explains that one of the problems is the projects' weak connections with their

surrounding urban context; thus, he says, "In this sense they are no different than other suburban planned unit developments" (ibid., p. 27).

Southworth (1995) also points out what he believes to be weak connections in their street patterns. He observes that New Urbanist towns have more loops and cul-de-sacs than earlier suburban patterns from 1960s and 1970s, although he also admits that they have fewer such elements than the most recent suburban patterns (ibid., p. 31). One critic even asserts that New Urbanism contributes to suburban sprawl because the developments are subdivisions rather than towns (Kreiger, 1998).

Other critics argue that cars remain crucially necessary for mobility in the New Urbanist developments due to a high proportion of external trips to and from the development (Godon et al., 1998). These critics say this is inevitable, since almost all jobs are outside the developments. Because of a skills mismatch, community residents tend to work elsewhere, while commuters from outside fill jobs in the developments. Moreover, commercial development in most New Urbanist developments lags; facilities develop slowly as shoppers are attracted to malls outside the area and other large-scale cluster developments (ibid.). Southworth (1995) also says, "While the sites do accommodate retail and commercial uses, residential connections to them are still somewhat auto-dependent" (ibid., p. 31). In fact, the New Urbanist community residents have similar automobiles per household ratios to households elsewhere (Godon et al., 1998).

Besides criticizing the location of employment and commercial facilities, these planning critics of New Urbanism also question the "walkability" in New

Urbanist developments. They argue that, even within high-density communities, the distances to many services are too great to expect average American to walk to them on a regular basis (Gordon et al., 1998; Southworth, 1995), while bicycles remain only a secondary travel mode, at least for Americans (Gordon et al., 1998). Southworth (1995) concludes that “for most residents these communities are likely to remain auto-oriented like other suburbs” (ibid., p. 31).

Furthermore, these critics point out the lack of public transit service linking the New Urbanist communities with nearby centers (Gordon et al., 1998). These critics question the viability of public transit, saying that the New Urbanist communities are never dense or large enough to justify significant (i.e. frequent) transit service (Downs, 1994; Kreiger, 1998). One critic also claims that low densities of New Urbanist developments cannot support mixed land use (Kreiger, 1998), and Southworth (1995) renounces the ineffectiveness of public transit, saying that, because of land use patterns and density, New Urbanist developments can never be as convenient as early twentieth-century street car suburbs, which New Urbanism seeks to emulate (Southworth, 1995, p. 34).

Gordon et al. (1998) further question the New Urbanists’ premise that higher density cuts auto use among residents. These critics say that, although the New Urbanists claim that higher density would reduce auto dependence, careful analysis of auto travel suggests that it is unclear whether higher-density communities will result in more or fewer auto trips (Crane, 1996, cited in Gordon et al., 1998). Thus, these critics conclude that the New Urbanist strategy, even without considering the

density issue, probably will result in more commuting rather than less (Godon et al., 1998). As Southworth (1995) suggests,

The creation of walkable enclaves within regional sprawl, however, delightful, may not reduce automobile dependence or solve regional transportation and environmental problems. ... Piecemeal efforts to create imageable and comfortable neighborhoods will result in little more than the old suburb in a new style (ibid., p. 37).

Architectural Criticisms

Turning to architecture, some critics dismiss New Urbanism as nostalgic yearnings, which are said to be demonstrated in New Urbanist plans that distort historical and regional specificity, "although neotraditional town planners claim their designs stem from actual turn-of-the century American towns from specific regions (Till, 1993, p. 719). These critics often presuppose that architecture's major task is "to invent new urban models that reflect the social and cultural realities of the modern condition. That requires a willingness to look at the future head on, without sentimentality" (Ouroussoff, 2000, p. 82). Ouroussoff (2000) describes New Urbanist developments as "a parody of small-town America. And like most sentimental dreams, the design forsakes true imagination for the illusion of security and social stability" (ibid., p. 6). Similarly, Kreiger (1998) says that the designs are "sanitized versions that avoid the messier attributes of town life" (ibid., ¶ 12). He further argues that "New Urbanism is ... a form of new suburbanism, that its primary appeal is through nostalgia, that it advances a rear-guard architectural esthetic, and that there is nothing new, or even urban, about it" (ibid., ¶ 3).

Moreover, some critics say that the New Urbanism is a mere business, arguing that it is "the unreflective repetition of commercially successful architectural motifs" (Falconer Al-Hindi et al., 1997, p. 362). Till (1993) argues that the New Urbanists "create idealized images which harken back to an ambiguous past based on the tastes of particular regional markets" (ibid., p. 719). Nevertheless, Vincent Scully commends Duany and Plater-Zyberk for their professional courage: "Unless you've been marinated in the modern movement, you can't imagine [how] brave [they are]" (quoted in Morgenthaler, 1993, p. A12).

Shibley (1998) argues that the New Urbanism is "a totalizing, finished project where there is no real room to challenge the dominant cultural and social themes invisibly embedded in the work" (ibid., p. 89). He concludes that New Urbanism is "as unapproachable and vulnerable to vulgarization as the Modernism it would replace" (ibid., p.90). Harvey (1997) argues that New Urbanism does not recognize the fact that "the fundamental difficulty with modernism was its persistent habit of privileging spatial forms over social processes. ... The effect is to destroy the possibility of history and ensure social stability by containing all processes within a spatial frame" (ibid., ¶ 5).

In the same vein, Southworth (1995) and Till (1993) assert that New Urbanist developments do not allow for or encourage the creation of identity over time based on the consumers' needs or aspirations because the "experts" have already made it for them, so change is unnecessary (Southworth, p. 36; Till, p. 729). Southworth (1995) further explains:

Community and neighborhood are spoken of as physical rather than social entities, as if community resulted from built form rather than from the

people who inhabit it. As a reaction to the anonymous sprawl of suburbia, the tendency has been for the designer to superimpose an image on a development before it is even occupied, to provide a "scenographic" setting that is fixed and unchangeable that occupants and users cannot shape over time (ibid., p. 36).

Till (1993) also points out that "Places and communities are not static objects 'out there' but are 'felt centers of meaning' created by individuals" (Tuan, 1977, quoted in Till, p. 729). She claims that the New Urbanists' notion of community is "intrinsically static and disposed toward preserving and codifying what already exists" (Shirvani, 1988, quoted in Till, p. 729) because specific design guidelines are based on marketing data (ibid.).

Shibley (1998) uses Calthorpe's *The Next American Metropolis* (Calthorpe, 1993) to epitomize the problem. While Calthorpe encourages collaboration with virtually everyone in the region, "there is no discussion of specifically how this collaboration is to occur or how to negotiate and modify the guidelines in cooperation with local knowledge" (Shibley, 1998, p.89). Shibley concludes:

The way of working that opens the discussion, captures value from the dialogue, and frames actions accordingly is dramatically absent from both the projects and the literature of the movement. The encouragement is there to treat guidelines tentatively and to engage in a broad public discussion, but there is no discipline suggested for the conduct of the conversation (ibid., p.90).

Shibley (1998) then points out two problematic results of New Urbanism: One is a notion that development can be successful as long as the design is in compliance with the New Urbanist principles but "not in the messy exercise of critical thinking and collaborative action necessary to build a community" (ibid.,

p.92-93). Another is an implication that if the designers only had the power to enforce the New Urbanist principles, “then the infrastructure would be in place to achieve ‘real’ community” (ibid., p.97). However, Shibley says, “Such power should not exist in a democratic state outside the reach of public direction” (ibid.).

Shibley (1998) finally warns that the New Urbanism standards “would celebrate the similarities and do violence to those who would celebrate the differences” (Shibley, 1998, p.97). Then he suggests that the New Urbanist principles need to be “the fluid, often unruly, and always a partial practice of placemaking” in order to balance the totalizing prescriptions (ibid.). Similarly, Harvey (1997) says that the movement needs “to understand urbanization as a group of fluid processes in a dialectical relation to the spatial forms to which they give rise and which in turn contain them. A utopianism of process looks very different from a utopianism of spatial form” (ibid., ¶ 12). Otherwise, the New Urbanist developments “will be artificial and lack the depth and variety of places that grew up over the course of time with significant input by each generation” (Shibley, 1998, p. 88).

The Behavioral Critique of New Urbanism

Some critics see New Urbanism through the psychological lens of consumers’. Southworth (1995) introduces the assertion that “consumers really don’t want walkability, sociability, and convenience and that the market demonstrates that the traditional auto-oriented suburban model that emphasizes that single family home – not community – is doing just fine” (ibid., p. 1). One of

these critics, Gordon et al. (1998), claims that housing preferences have changed little, citing Fannie Mae surveys: “Regardless of income, race or current tenure status, 75-80 percent of households would prefer to live in a single family home with a private yard” (Gordon et al., 1998, ¶ 6, part I). Another critic questions if the “preference for neighborhood and community (presuming it really exists) will easily displace America’s love affair with the car, even if such a displacement is economically feasible” (Harvey, 1997, ¶ 4). Similarly, Jackson (1995) argues that Americans are not really looking for an alternative to suburbs:

Americans are of two minds as to how we ought to live. Publicly we say harsh things about urban sprawl and suburbia, and we encourage activity in the heart of town. In theory, but only in theory, we want to duplicate the traditional compact European community where everyone takes part in a rich and diversified public life. But at the same time most of us are secretly pining for a secluded hideaway, a piece of land, or a small house in the country where we can lead an intensely private nonurban existence, staying close to home. ... While we agree that scatteration and the dying central city are both of them unsightly and illogical, we also, ... feel a deep and persistent need for privacy and independence in our domestic life (ibid., p. 24).

Nevertheless, many residents express their preferences for the New Urban developments, saying that the community is safe, social, and pedestrian-friendly. For example, a couple in Kentlands explains that, “We made more friends here in two months than we did in the other place in 10 years” (Marshall, 1996, p. 71). Journalists who wrote a book on the New Urbanist town, Celebration, Florida, also reached a similar conclusion (Franz et al., 1999).

Brown et al. (1998) examine New Urbanists’ claims regarding porches and conclude that, in fact, New Urbanists have underestimated the porch’s positive functions and range of social and psychological benefits. Brown et al. argue that

New Urbanists value porches just because they can support and enhance neighborhood cohesion; however, these researchers conclude that, there are other social and psychological benefits as well (ibid., p. 591), namely “the choice provided beyond the reach of the television” and “the quality and memorability of porch activities” (ibid., p. 592-593). Overall, their study finds that porches have an ability to provide “much prized leisure time for individuals and families” (ibid., p. 591):

For the individual, the front porch provides a good place to be alone and supports a number of pleasurable activities one can do alone, such as watching the neighborhood, reading a book, or enjoying nature. For households, the porch provides a site for sibling interaction; parent interaction; parent-child interaction; and interaction among neighbors, friends, and family members (ibid.).

Brown et al. recognize, nevertheless, that “such minor involvements in neighboring may not replicate historical patterns of extensive neighborhood exchange and obligation but may provide modern communities with exactly what they want in a sense of community” (ibid., p. 592).

In contrast to Brown et al. (1998), other critics believe that the New Urbanists are unrealistically nostalgic and provide overly romantic calls for an architectural and community past that never existed (Till, 1993). However, the results of Brown’s study undermine such criticism. “A variety of fond memories are attached to the front porch” (Brown et al., 1998, p. 579), and “residents recall a wide variety of pleasant uses of the front porch, especially in the past era” (ibid., p. 590).

In the same vein, Martin (1996) found that alleyways serve broad purposes by providing rich informal neighborly settings: "As in the plans of new urbanists, the alley is seen essentially as a service corridor, a place to hide all the things not fit to be seen out front" (ibid., p. 141). In this sense, New Urbanists "overlook the potential of the alley to serve a much broader purpose in the support of neighborhood activities... [A]lleys can be seen as diverse landscapes which function ably as service corridors but attract and support a great range of non-service community use" (ibid., p. 138) as in pre-WWII alley-inclusive neighborhoods.

In these two chapters on criticisms of New Urbanism, I have reviewed five themes: economic, sociological, planning, architectural, and behavioral criticisms. These reviews are, by no means exhaustive; there are many conceptual criticisms I did not cover. Nevertheless, the great range of criticisms proves New Urbanism's extremely broad scope and demonstrates its extensive impacts.

Although I do not deal with all the issues these critics raise, in the next chapter, I begin the empirical analysis of Kentlands, Laguna West, Elmwood, and Four Colonies by discussing the history and design of the four communities.

CHAPTER 5

DESCRIPTIONS OF THE FOUR STUDY SITES

This chapter describes the two New Urbanist developments selected for study in this thesis – Kentlands in Gaithersburg, Maryland; and Laguna West in Elk Grove, California. These communities are two major types of New Urbanist development: Traditional Neighborhood Design (TND) and Transit-Oriented Development (TOD), respectively. Kentlands and Laguna West are selected because they are classic examples of these New Urbanist types, and they are sufficiently completed – 264 acres of Kentlands, and 310 acres of Laguna West (*New Urban News*, 1997, September-October, pp. 10-11).

As benchmarks for comparing and contrasting these two New Urbanist communities, I also describe a traditional “streetcar” suburb – the Elmwood district in Berkeley, California; and a conventional low-density suburban development – Four Colonies in Lenexa, Kansas. These four communities are selected because they represent four different types of land developments – a Traditional Neighborhood Design (Kentlands), a Transit-Oriented Development (Laguna West), a high-density central city neighborhood (Elmwood), and a low-density planned unit development (Four Colonies).

Each community is described in terms of location, community plan, development status, and physical and social characteristics such as land use, density, grain of development, street design, circulation system, transportation,

pedestrian access, public spaces, landscaping and architectural style, and relation to existing metropolitan region.

Most of the information presented here for Kentlands and Laguna West is excerpted from *Valuing The New Urbanism: The Impact of the New Urbanism On Prices of Single-Family Homes* by Mark J. Eppli and Charles C. Tu (1999).

Information for Kentlands, Laguna West, and Elmwood is provided by two articles, "The Suburban Public Realm II: Eurourbanism, New Urbanism and the Implications for Urban Design in the American Metropolis" by Michael Southworth and Balaji Parthasarathy (1997), and "Walkable Suburbs?: An Evaluation of Neotraditional Communities at the Urban Edge" by Michael Southworth (1995).

Finally, information on Four Colonies is taken from *PUDs in Practice* by Colleen Grogan Moore and Cheryl Siskin (1985).

Kentlands – Traditional Neighborhood Design (TND)

Kentlands was designed by architects Andres Duany and Elizabeth Plater-Zyberk in 1988 and represents one of the earliest and best examples of New Urbanist development. It is one of the most cited New Urbanist projects because of such features as mixed housing types, interconnected streets, a pedestrian-friendly environment, and, in particular, its architectural design (Figure 5.1).

Kentlands is a 352-acre project at the southwestern edge of Gaithersburg, Maryland, which is located 13 miles northwest of Washington, D. C. The master plan includes 1,600 dwelling units, 1 million square feet of office space, and 1.2 million square feet of retail space (Figure 5.2). The projected population is 5,000.

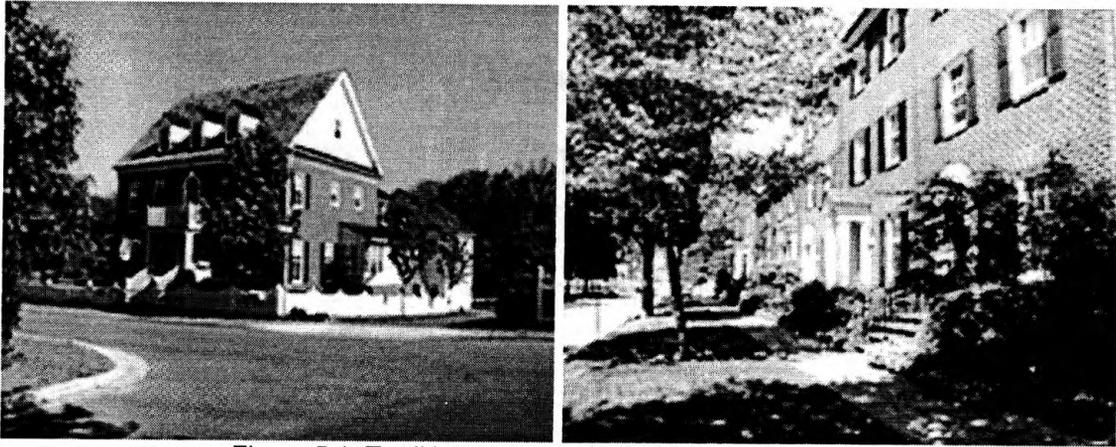


Figure 5.1 Traditional Architectural Design in Kentlands

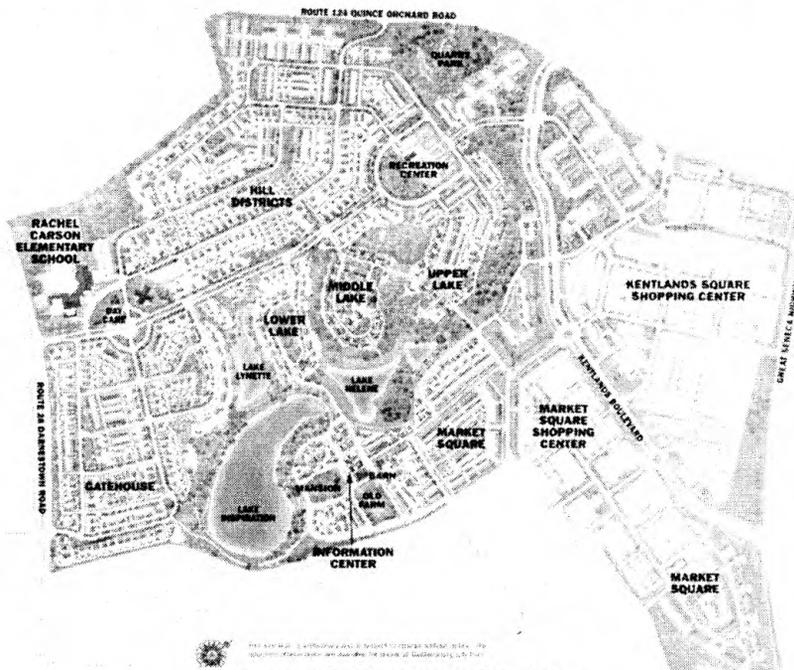


Figure 5.2 Kentlands Site Plan

Construction began in 1989, and as of late 1998, 1,200 housing units and 335,000 square feet of retail space had been completed. Other completed facilities include an elementary school (Figure 5.3), a clubhouse, a daycare center, two churches, a community recreation center, and a library. However, one million square feet of office space is unlikely to be built because of the

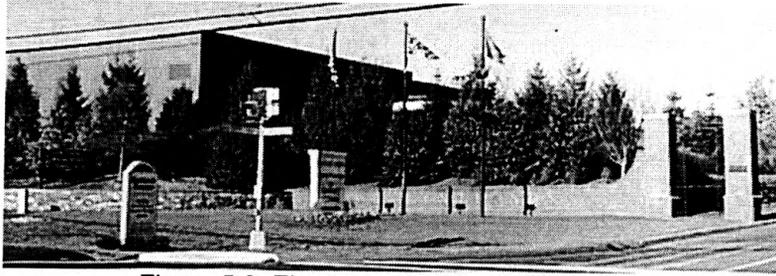


Figure 5.3 Elementary School in Kentlands

excess supply of office space in the region (Eppli et. al., 1999, p. 25; Southworth, 1995, p. 3).

The development is sited on the historic Kent Farm tract with gently rolling hills, mature trees and ponds; original topographic features and nature of the old farm have been retained with minimal site grading (Figure 5.4). By incorporating these natural features, the development is organized into several neighborhoods including the Old Farm District, the Hill District, the Gatehouse District, the Lake District, and Midtown/Downtown adjacent to the shopping mall. Each neighborhood has a distinctive character. For example, the Old Farm neighborhood surrounds the restored original Kent homestead, which currently serves as the town's cultural arts center (Figure 5.5), while the Hill District, centered around a community clubhouse, overlooks the Old Farm and the wetlands.

Along with these unique districts, Kentlands has a greater mix of housing types than conventional suburbs. These types include single-family detached houses, row houses or townhouses (Figure 5.6), condominiums (Figure 5.7), and apartments; in addition, many of the garages have living units (carriage houses or granny flats) above. As a result of this mixture, the development pattern is a



Figure 5.4 Mature Trees and Ponds in Kentlands

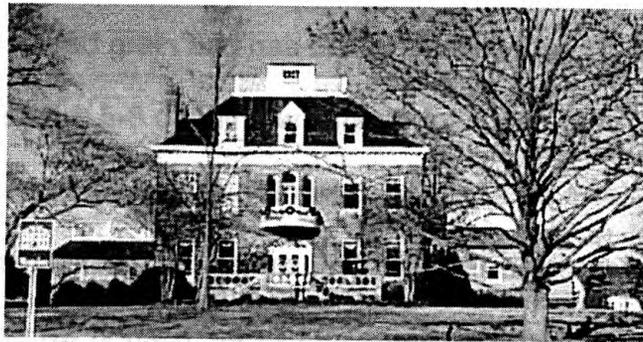


Figure 5.5 Restored Original Kent Homestead



Figure 5.6 Single-Family Detached House and Row Houses in Kentlands



Figure 5.7 Condominium in Kentlands

relatively fine and varied grain and has higher density than typical suburbs. Net residential densities are 5-8 dwelling units/acre for single-family homes to 17 dwelling units/acre for row houses. Gross density is 4.78 dwelling units/acre. Lot sizes range from small-town house lots up to quarter-acre customhouse lots: 22-foot-lot frontage for row houses, 44 feet for small detached houses, 66 feet for large-detached houses, and 88 feet for estate-detached houses.

Local streets in the community are somewhat narrower than those in conventional suburbs, and this feature helps create a more pedestrian-friendly environment. Sidewalks are planted with trees and are found on both sides of all streets (Figure 5.8), and parking lanes protect pedestrians from traffic. A street has a 50-foot right of way: a 36-foot pavement, which consists of two 10-foot driving lanes and two 8-foot parking lanes, and 4-5 feet sidewalks and a planting strip. A 26-foot-wide alley consists of a 12-foot paved lane and 7-foot grass strips on each side.

Kentlands also includes a variety of public open spaces, which cover approximately 100 acres or 28 percent of the site. They come in many sizes and

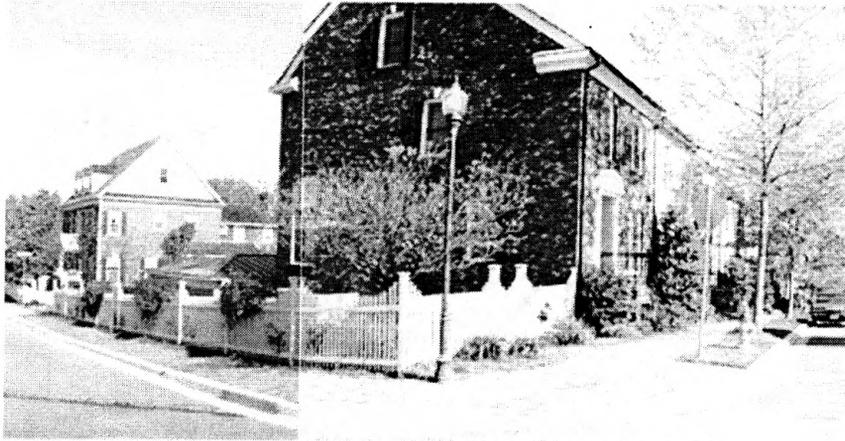


Figure 5.8 Sidewalk with Trees in Kentlands

forms including village greens, a pond and a recreational park. They are accessible and have been provided much more plentifully than those in most suburbs or traditional neighborhoods.

Finally, a considerable architectural variety is created in the community through changes in detail, color, topography, or through house types. Especially, the exterior appearance of the housing units is markedly different from surrounding conventional subdivisions with strong architectural reference to the past that blends Federal, Classical Revival, and other traditional styles (Figure 5.9). Some of the design features are white picket fences, front porches (Figure 5.10), wrought iron railings, and much brick and stone with traditional detailing vaguely in Maryland/Virginia vernacular. Moreover, front-loading garages and driveways are replaced with alleys with garages, back lanes, and carriage house courts, which can be explored.

In terms of the development's relation to the larger metropolitan region, however, Kentlands' location is rather insular at the urban periphery. Residents are dependent on Gaithersburg, Maryland, and the larger Washington D.C.



Figure 5.9 Classical Revival and Federal Style Architecture in Kentlands

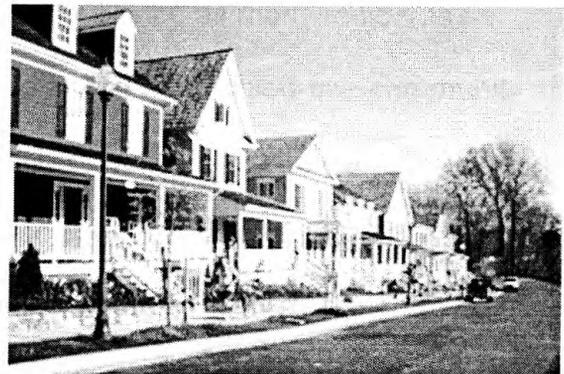


Figure 5.10 White Picket Fences and Front Porches in Kentlands

metropolitan region for most services and jobs. Although there is a link to a regional subway station provided by local bus service through the community, because of its periphery location, most residents are said to drive to work (Eppli et. al., 1999, p. 25; Southworth, 1995, p. 34).

Laguna West – Transit-Oriented Development (TOD)

Laguna West was designed by Peter Calthorpe and Associates. It is built on a flat, treeless, former rice paddy in Elk Grove, California, which is approximately 12 miles south of downtown Sacramento. Although the Elk Grove

area has been intensively developed in recent years, most new developments in the area are conventional subdivisions, and Laguna West is the only community designed with New Urbanist principles. Calthorpe's "pedestrian pocket" concept emphasizes a pedestrian-friendly environment in the community, including attractive streetscapes, an accessible lakefront, and a planned mixed-use town center featuring shops, a village green, and a community center.

The 1,018-acre site is almost three times the size of Kentlands, and the projected population is 8-10,000, which is about twice as many residents as Kentlands (Figure 5.11). Laguna West is planned for a mixed-use community with 3,200 dwelling units (2,000 single-family houses, 1,200 multifamily units), a community center, retail space, offices, civic space, and a light industrial zone adjacent to the project site. The development was originally designed to be a major stop of a regional light-rail system as a Transit-Oriented Development. The overall plan consists of a mixed-use town center surrounded by a lake on three sides and connected by radial boulevards to parcels on the lake's other side.

Construction began in 1990, and approximately 600 single-family housing units, a housing complex for senior citizens, the Town Hall, a recreation and community center, a day-care center, a church, a retail market, and an elementary school had been built as of fall 1999 (Figure 5.12). Apple Computer and JVC Corp. also have built offices and manufacturing facilities in the industrial zone adjacent to the site (Figure 5.13). However, proposed multifamily components such as condominiums and apartments, which are located between

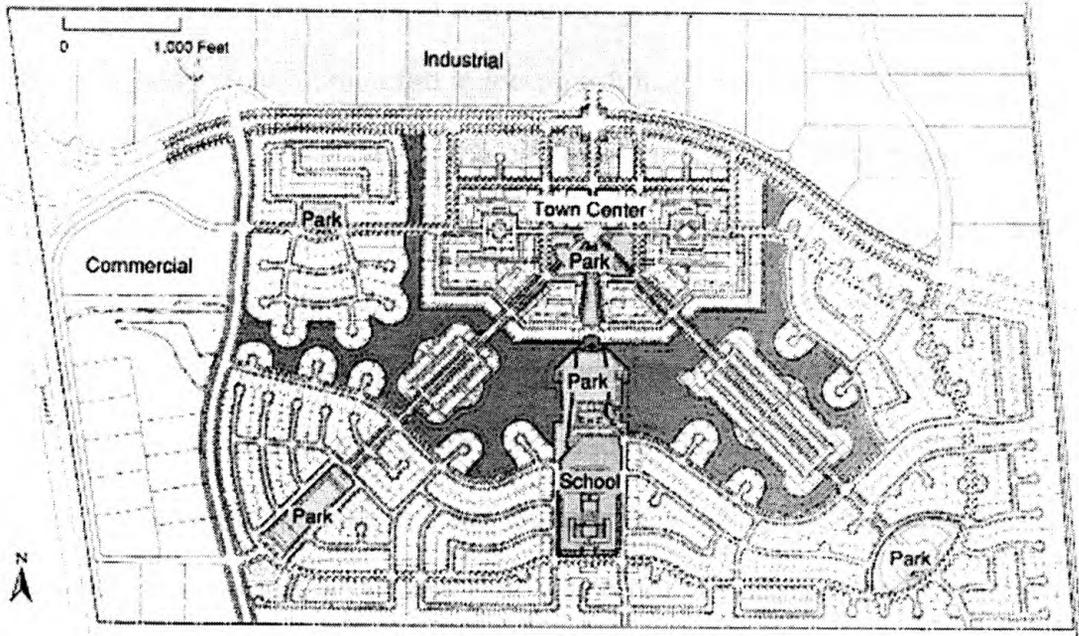


Figure 5.11 Laguna West Site Plan

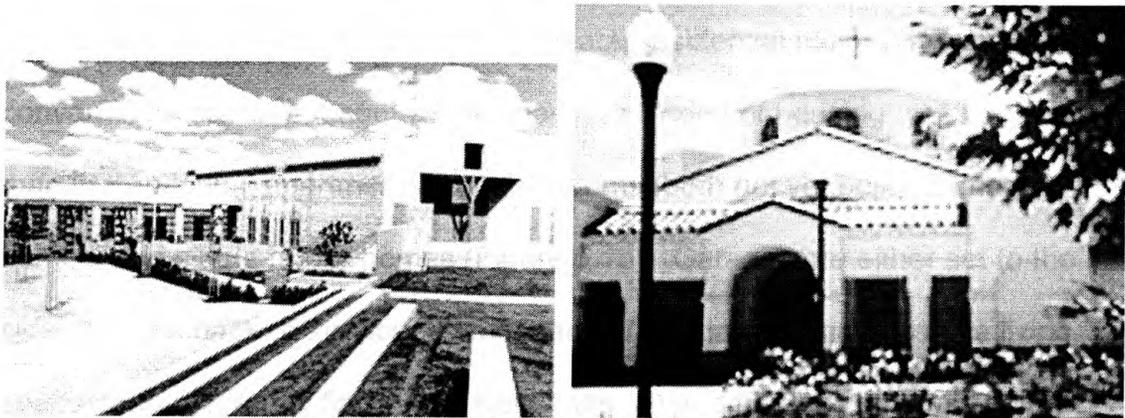


Figure 5.12 Town Hall and a Church in Laguna West

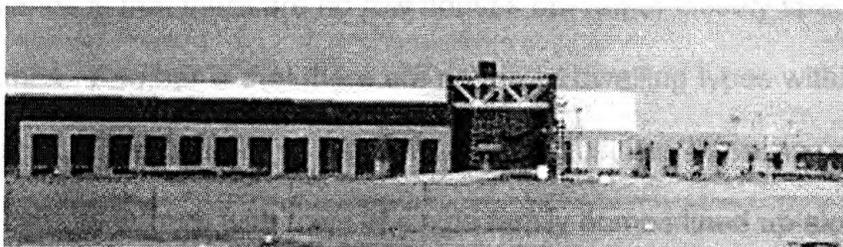


Figure 5.13 Apple Computer Factory in Laguna West

the town center and single-family areas, are still in the planning stage and have not been built to date. Consequently, numerous empty lots stand between

completed areas and the center of activities (Figure 5.14). Further, the transit system is unlikely to be completed in the near future (Eppli et. al. 1999, p. 29).

The 73-acre artificial lake is the center of the Laguna West design and provides a waterfront ambience while achieving open-space preservation, flood detention, and irrigation (Figure 5.15). Also, the lake ostensibly serves the ecological function of purifying runoff by natural means before entering the adjacent wetland. Special plants are also used to manage nutrients and pollution. Adjacent to the lake is Town Square Park with a basketball court, playground, rose garden, and Town Hall, which has a multipurpose room that accommodate 500 people and an outdoor amphitheater.

Although the community has a greater residential mixture than in conventional suburbs, Laguna West has less mixing of housing types and sizes than in Kentlands: apartments, condominiums (both not yet built), carriage homes, and single-family homes (Figure 5.16). Garages are either set to the side or to the back of the house, and many of the garages have usable living spaces above (granny flats) as in Kentlands. One difference in housing type from Kentlands is that there are no row houses but rather closely spaced zero-lot-line homes. Another is that there are no mixed dwelling types within a single street or block. Because of this feature, Laguna West has the sense of a late-twentieth-century suburb with rows of single family homes lined up along barren curving streets – an ambience that is quite different from the more traditional qualities of Kentlands (Figure 5.17).

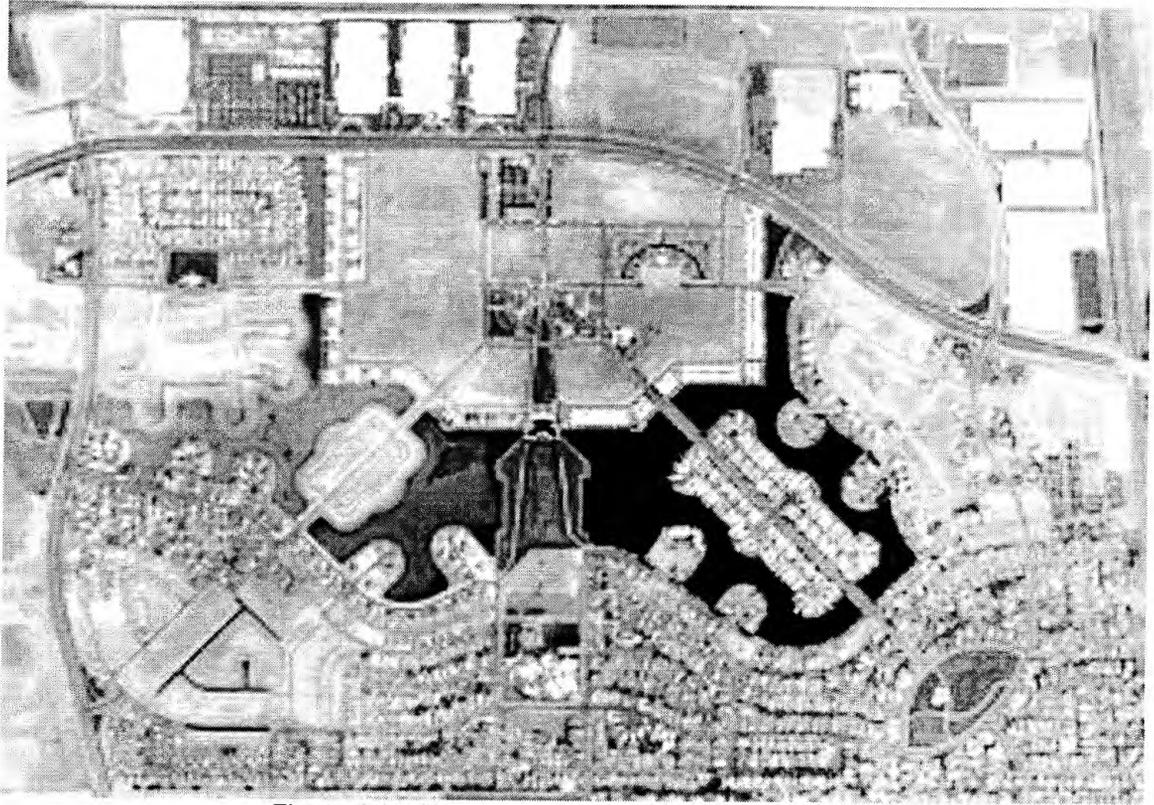


Figure 5.14 Numerous Empty Lots in Laguna West



Figure 5.15 Waterfront in Laguna West

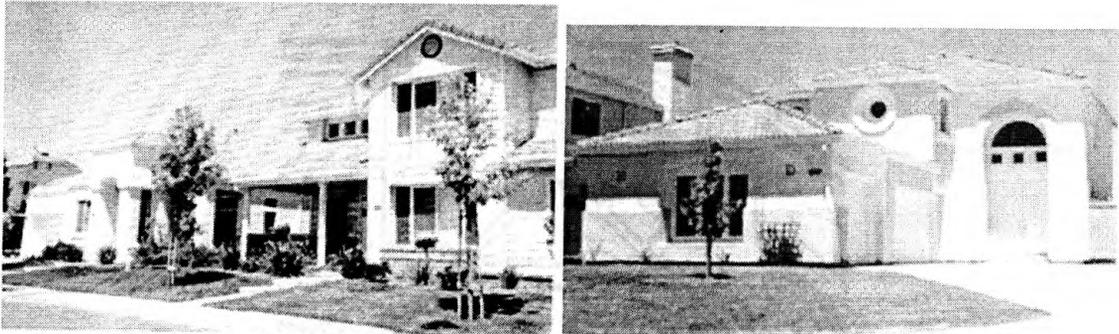


Figure 5.16 Single-Family Homes in Laguna West

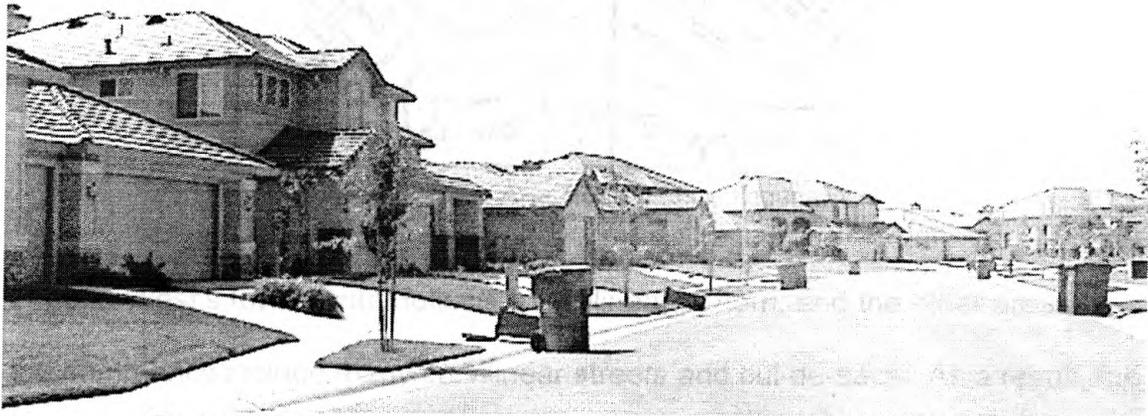


Figure 5.17 Sense of A Late-Twentieth-Century Suburb in Laguna West

The built-form pattern in Laguna West is more coarse and repetitive than in Kentlands. Net residential densities are 1.28–6.5 dwelling units/acre for single-family homes, 15 dwelling units/acre for carriage homes (zero-lot-line single-family), and 17–25 dwelling units/acre for apartments and condominiums. Gross density is 3.24 dwelling units/acre. Lot frontage widths are 34, 45 and 60 feet. Moreover, because of its repetitiveness, a sense of clearly differentiated neighborhoods is missing as opposed to the Kentlands' unique districts.

However, in some ways, Laguna West appropriates the use of formal design element like Kentlands – for example, three strong axial boulevards radiating from the development's center (Figure 5.18). It also uses conventional street design elements such as a grid, curvilinear streets and cul-de-sacs.

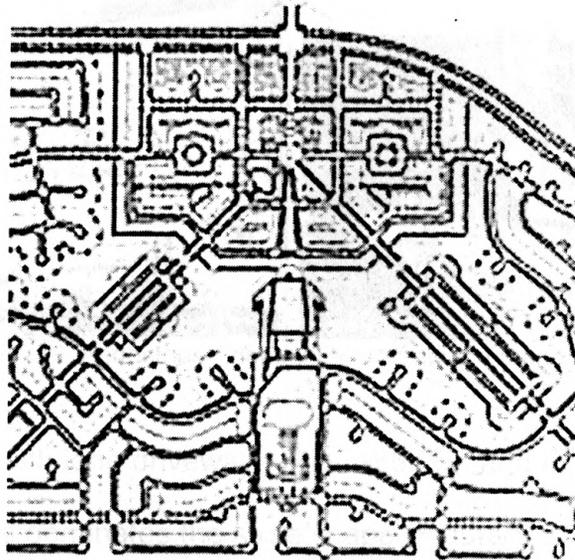


Figure 5.18 Three Axial Boulevards in Laguna West

Laguna West's town center follows a rectilinear pattern, and the other areas of the community include many curvilinear streets and cul-de-sacs. As a result, the street pattern is not strikingly different from the typical street pattern of conventional suburbs.

Major streets in Laguna West match postwar auto-oriented standards; however, local streets are somewhat narrower (30-foot wide) than those in conventional developments and help create a pedestrian-friendly environment (Figure 5.19). As in Kentlands, sidewalks are found on both sides of the streets, which are all lined with trees. Pedestrians are also protected from traffic by parking strips, which are broken by trees in wells that project into the street space. However, a pedestrian-friendly environment is not consistently available. For example, alleys and rear-entrance garages are available in only a small section of the development; in some areas, garages are placed at the rear of the

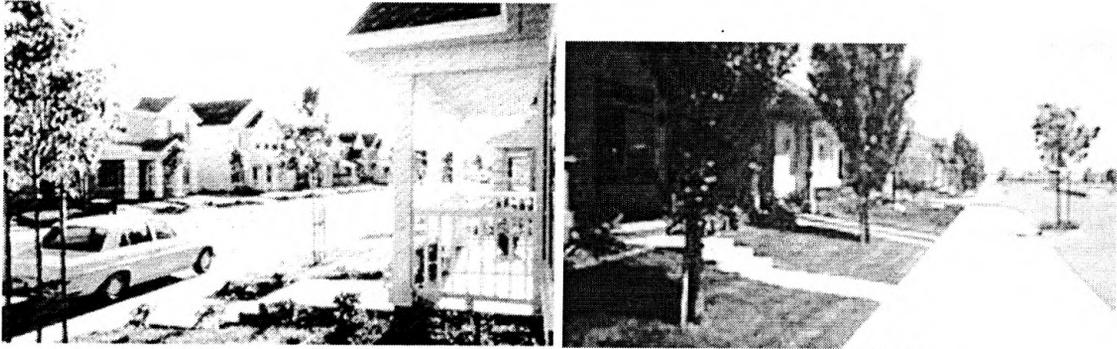


Figure 5.19 Pedestrian-Friendly Environment in Laguna West

site and connected with long driveways (Figure 5.20), and in other areas, the view of garage doors dominates the streetscape (Figure 5.21).

Nevertheless, public open spaces are readily accessible and have been provided plentifully as in Kentlands. 205 acres (20 per cent of the site) are devoted to public open space in Laguna West, of which about 68 acres (one third of the open space) are shallow lagoons with the rest being allocated to neighborhood parks, which include four large and three smaller facilities.

In terms of architectural design, Laguna West has much less apparent architectural control and historicism than Kentlands. The exteriors of houses are designed in a contemporary style similar to other subdivisions in the area; however, there is a stronger sense of “streetscape” than in most suburbs due to front porches and yards. Garages, too, are set to the side or back, thus avoiding a “garagescape” street image.

Considering its relation to the larger metropolitan region, Laguna West is an insular development at the urban periphery and, like other suburban PUDs, is weakly connected with the surrounding urban context. Also, like Kentlands, Laguna West must draw on the larger metropolitan region for jobs and services.



Figure 5.20 Rear Garage in Laguna West



Figure 5.21 Garage-Door-Dominant Streetscape in Laguna West

Moreover, regional transportation is largely auto-dependent without frequent public transit, although the development is within potential commuting distance (30 minutes) of both downtown Sacramento and Stockton.

Elmwood – Traditional Streetcar Suburb

Elmwood is a pleasant walkable neighborhood with a lively public realm (Southworth et. al., 1997, p. 22). This 225-acre district is located in Berkeley, California and is a traditional turn-of-the-century streetcar suburb. It has approximately 2,300 dwelling units including 1,100 single-family residences and is housing a total of approximately 5,000 people (Figure 5.22).



Figure 5.22 Elmwood District

Elmwood was originally an area of large estates but subdivided into several tracts in a housing boom after the 1906 San Francisco earthquake. It initially began as a true suburb set in open land away from the central city; nevertheless, public transit (streetcar) preceded Elmwood and was the incentive

for residential development. The community had grown incrementally, creating a homey, comfortable feeling (Southworth, 1995, p. 10).

The community consists of mainly single-family homes, yet houses vary in size from modest bungalows to large homes with several bedrooms (Figure 5.23). Some of these have been adapted for apartments or duplexes, and many



Figure 5.23 Various Houses in Elmwood

apartment buildings are scattered throughout the area. Besides housing, conveniently centrally located commercial district has numerous basic services, restaurants, and specialty shops (Figure 5.24). Accordingly, the grain of the built form at Elmwood is varied and finer than it is in Kentlands, Laguna West, and Four Colonies. Gross density, which is 10.24 dwelling units/acre, also is much

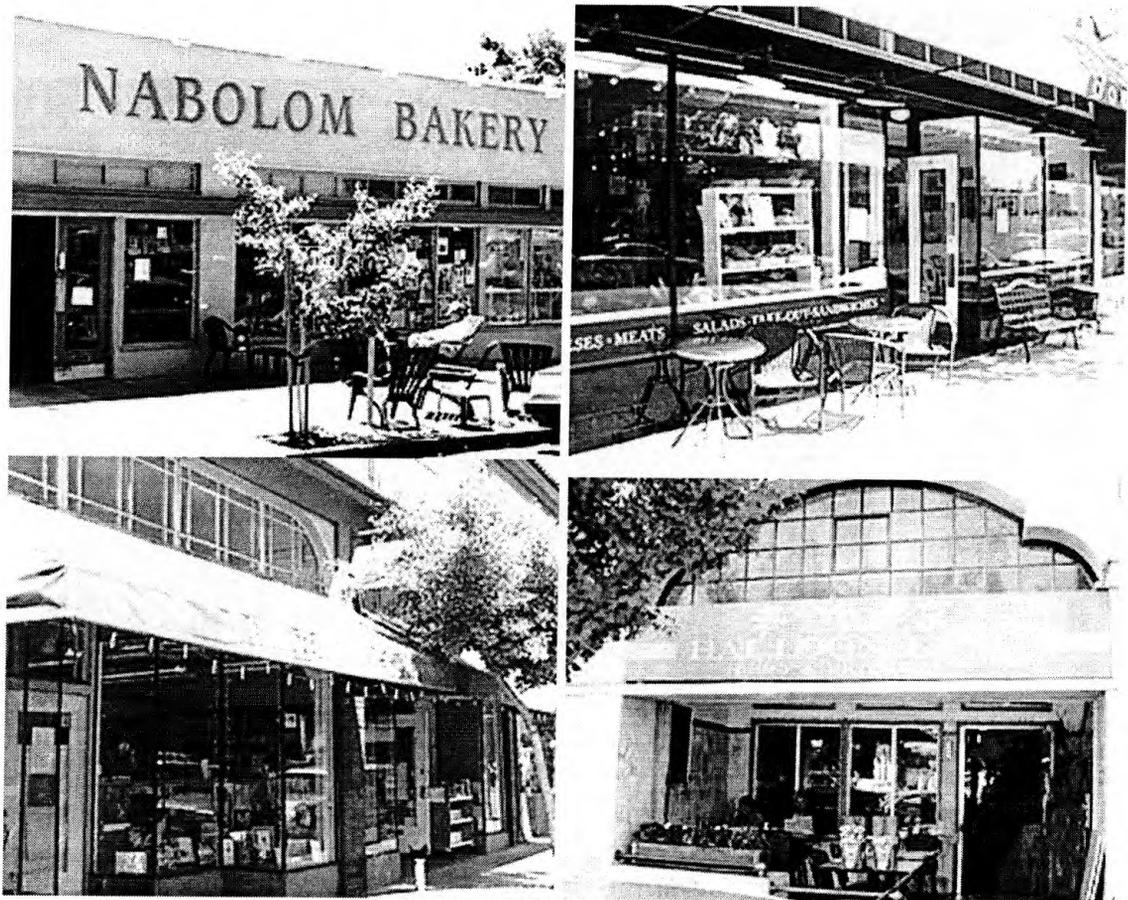


Figure 5.24 Various Services in Elmwood

higher than other three developments due to its relatively small amount of open space. Most single-family areas average 8 dwelling units/net acre, with a range of 6-10. Lot sizes are typically 30-40 feet wide by 120-135 feet deep.

Mature trees line both sides of the streets and shade the relatively narrow streets (30 to 34 feet wide) (Figure 5.25). The result is a sense of definition and enclosure on the public spaces (Southworth et. al., 1997, p. 26). There are no obvious formal street design elements nor exclusive pedestrian or bicycle routes unlike other developments; nonetheless, it is said that each street is unique and has visual interest (Southworth, 1995, p. 10). Sidewalks with narrow planting strips are also found on both sides of the streets as in Kentlands and Laguna



Figure 5.25 Mature Trees in Elmwood

West. Besides sidewalks and trees, parking lanes protect pedestrians from traffic. Another safety feature is "Berkeley Barriers." They are large concrete planters that serve as traffic barriers and were installed at intersections to regulate auto-traffic flow so that residential streets remain safe and quiet.

In contrast to the other three communities, there is very little designed public open space in Elmwood; there are virtually no parks or playgrounds within the district although there are major city and regional parks within half a mile.

Varied builders and architects built homes individually on a lot-by-lot basis in Elmwood. Closely spaced houses have many styles that range from craftsman shingle style to classical revival or Mediterranean, and the hand of a single designer or planner is not felt. Nevertheless, front porches dominate the street facades, and these porches are larger than those in Kentlands and Laguna West. Moreover, most of apartment buildings are harmonious in scale and style

with the single-family character in the area. Garages are typically small and situated near the rear corner of the lot due to narrower lots.

In terms of relation to the larger region, Elmwood today is an integral part of the Oakland-Berkeley metropolitan area after nearly a century of urban infill and expansion. It also has good access by transit to the larger city and region; bus stops are less than a 10-minute walk for most neighborhood residents, and rail transit is 3/4 mile away.

Four Colonies – Conventional Suburban Development

The plan of Four Colonies was conceived by Leo Ashner of Bodine-Ashner Builders in 1970. It is the first Planned Unit Development (PUD) and the first clustered-homes design in the Kansas City region (Figure 5.26). It is a conventional suburban residential development with a combination of single-family detached and attached homes, and a neighborhood commercial center.

A 141-acre residential community plan was approved in 1971. The development took place on an essentially flat field of former cropland in Lenexa, Kansas. The site is 12 miles southwest of downtown Kansas City and centrally located in Johnson County, which was the most affluent, rapidly growing county in the Kansas City standard metropolitan statistical area (SMSA) when the project concept was developed.

As its name suggests, Four Colonies was designed with four separate residential areas or “colonies.” Each of the colonies was to have its own recreational center with a swimming pool, wading pool, and other similar but

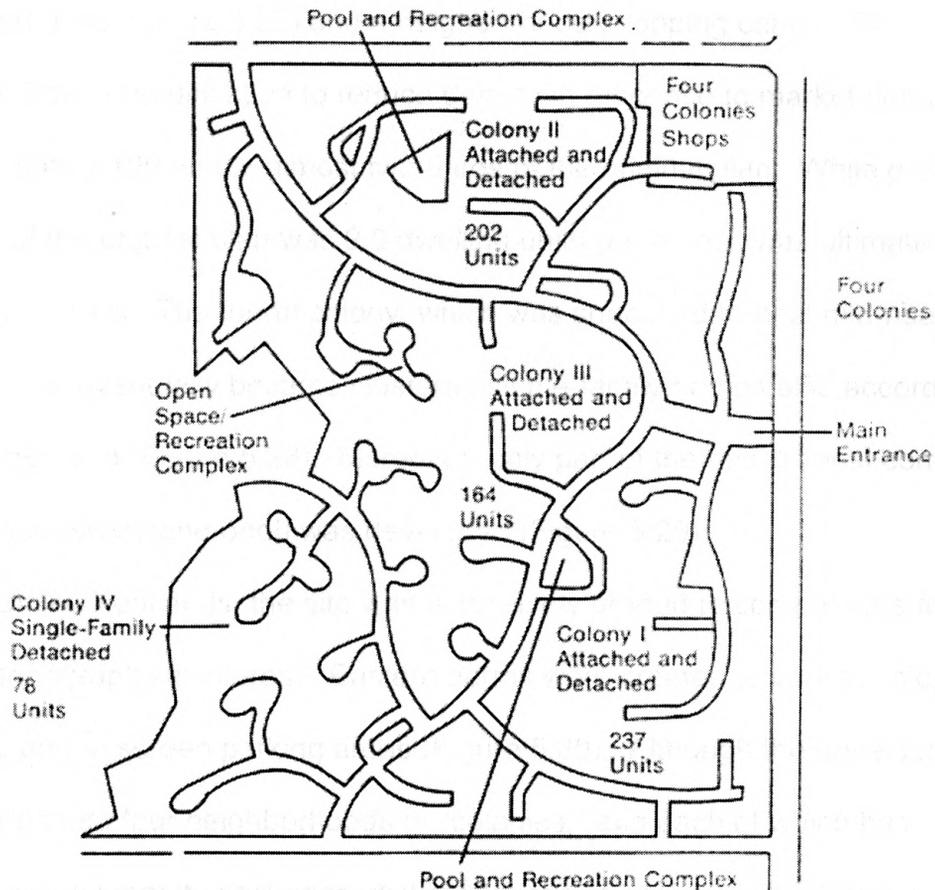


Figure 5.26 Four Colonies Site Plan

varied facilities. Colonies One, Two, and Three were to be developed with a mixture of single-family homes, four- and six-unit townhouses, and garden apartments. The fourth colony was to be built at a much higher density than the other colonies with four- and six-story apartment buildings. Besides 1,274 residential units in these colonies, the plan included a five-acre elementary school and a three-and-one-half-acre neighborhood shopping center. It is said the project would be unified by the design of the buildings, landscaping, and circulation system (Moore et. al., 1985, p. 73).

Four Colonies was completely built and occupied by 1981; however, it actually was developed with merely a mixture of 681 single-family attached and

detached units (Figure 5.27) and a neighborhood shopping center. The change resulted from a modification to reduce density in response to market demand for approximately 100 acres, almost two-thirds of the original plan. While gross density of the original plan was 9.0 dwelling units per acre, it was ultimately reduced into 4.8. The fourth colony, which was supposed to host mid-rise apartments, eventually became clustered single-family homes also according to market demand (Figure 5.28). Moreover, only part of the recreational complex (an outdoor swimming pool) was developed (Figure 5.29).

Unlike Kentlands, the site was extensively graded to compensate for the lack of topographical interest. Eastern berms were created to vary the slope of the land and to screen parking areas (Figure 5.30). Although the development is still divided into four neighborhoods or “colonies,” and each of which has individualized amenity packages, distinctiveness of each neighborhood is nominal especially if contrasted with Kentlands’ distinctive districts.

A mixture of building types ranges from patio house to sixplexes, a recreational complex, and walkway system that links private homes with community facilities (Figure 5.31). A commercial center has four freestanding uses: (1) a four-shop building, (2) a five-shop building, (3) a four-shop building with offices on the second floor, and (4) a basement auditorium. Occupants are a restaurant, a bank, a dry cleaner, a liquor store, a dairy store, a day-care center, and other neighborhood service businesses.

Four Colonies has an integration of commercial, residential, and recreational uses, but mix of housing types is limited. Gross density is about the

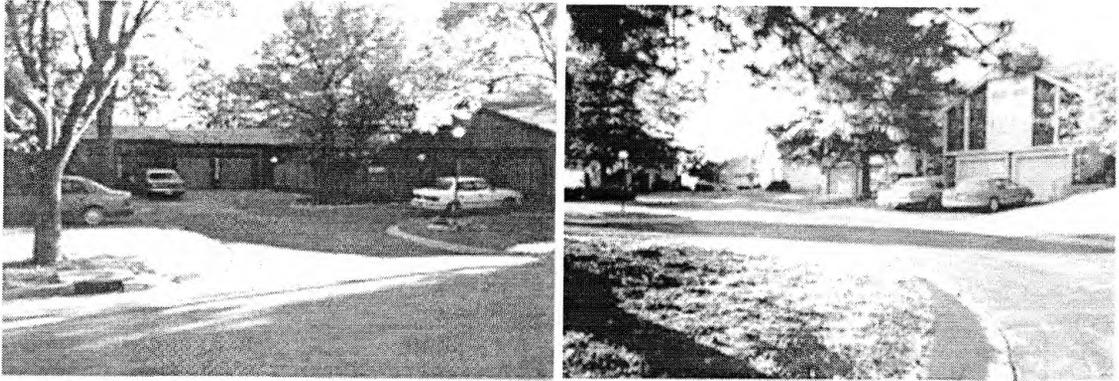


Figure 5.27 Single-Family Attached and Detached Units in Four Colonies

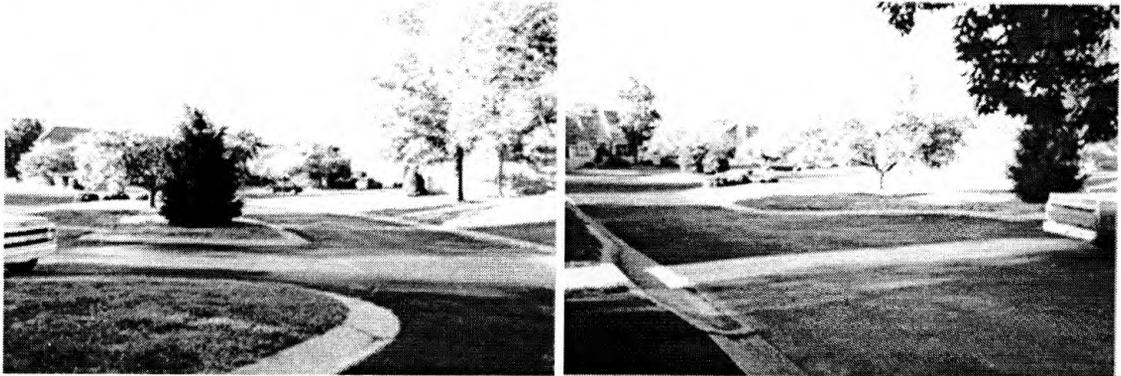


Figure 5.28 Clustered Single-Family Homes in Four Colonies

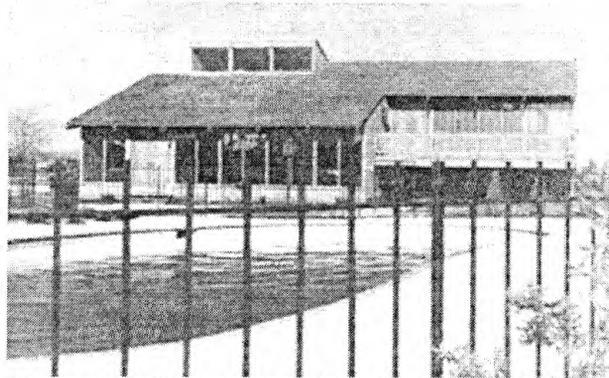


Figure 5.29 Recreational Complex in Four Colonies

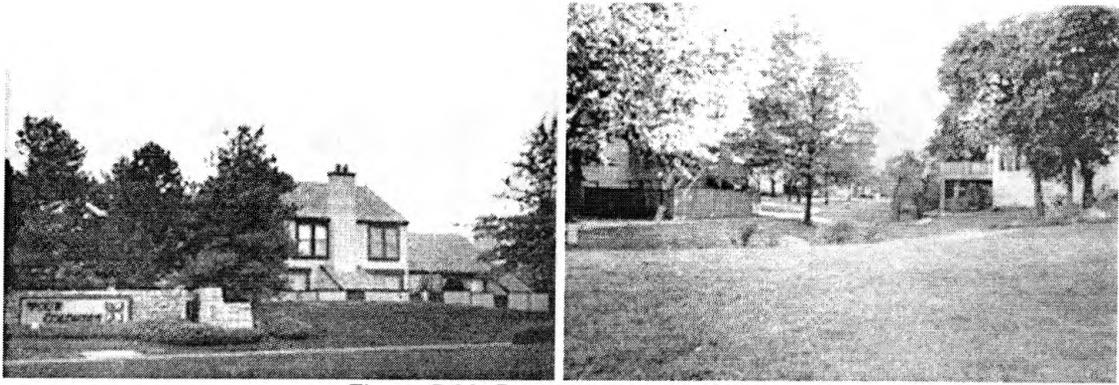


Figure 5.30 Berms in Four Colonies

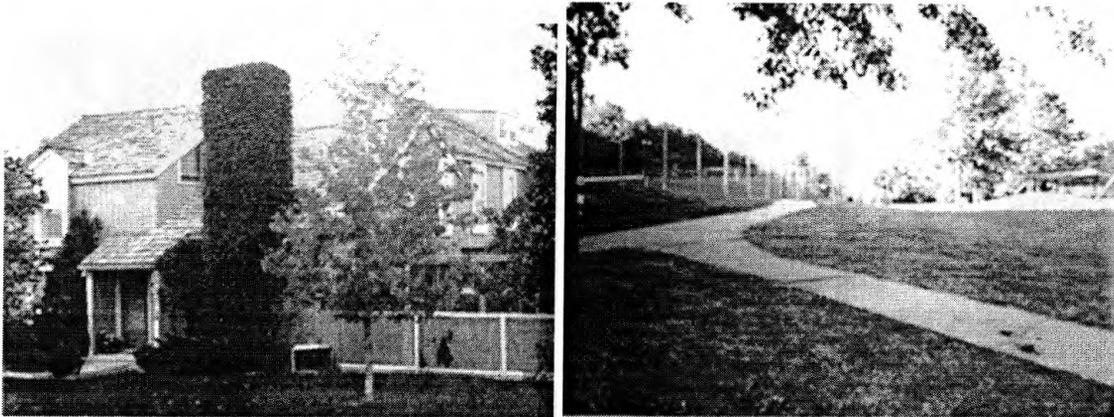


Figure 5.31 Typical Building Type and Walkway in Four Colonies

same as Kentlands, 4.8 dwelling units/acre; however, net density is lower than Kentlands.

Unlike the three other study sites, Four Colonies has no sidewalks (Figure 5.32) but rather a pedestrian walkway system that is separated from the streets and is a convenient and safe access to recreational facilities and the neighborhood shopping center (Figure 5.33). In many instances, residents can walk from their homes to the site's community swimming pool without crossing any streets.

Buildings are constructed in a rustic, contemporary style with an emphasis on stained-wood siding and fencing (Figure 5.34), heavy timber accents, cedar-



Figure 5.32 No Sidewalks in Four Colonies

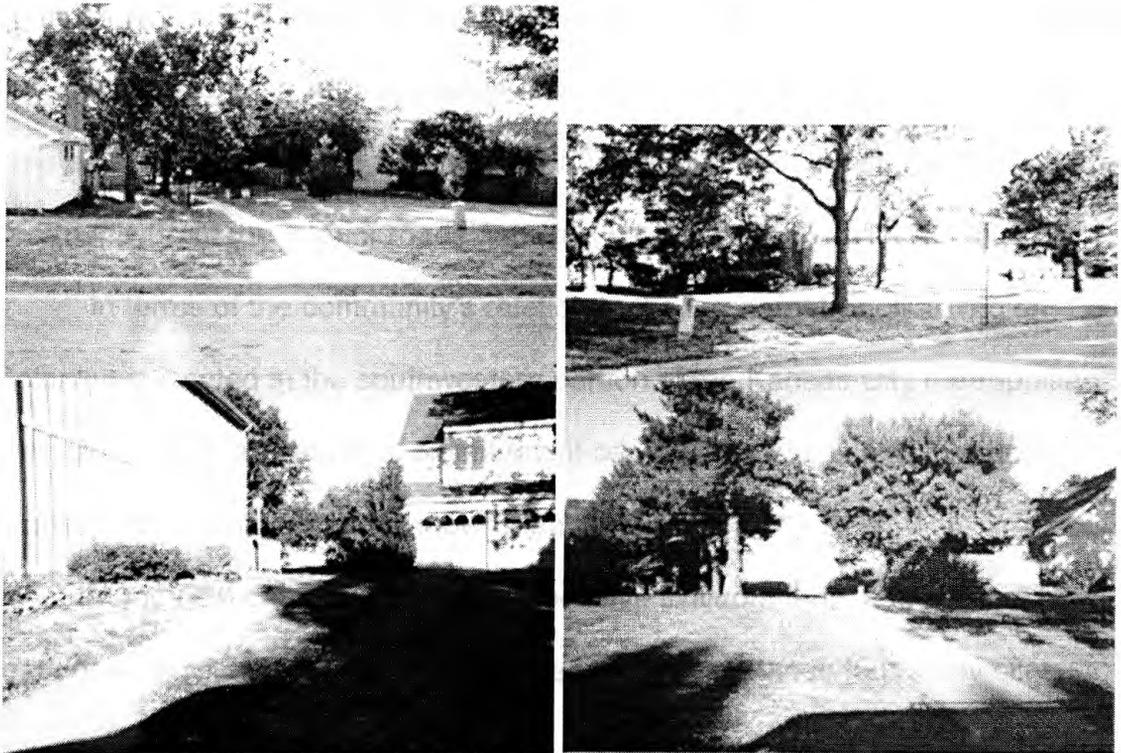


Figure 5.33 Walkways in Four Colonies

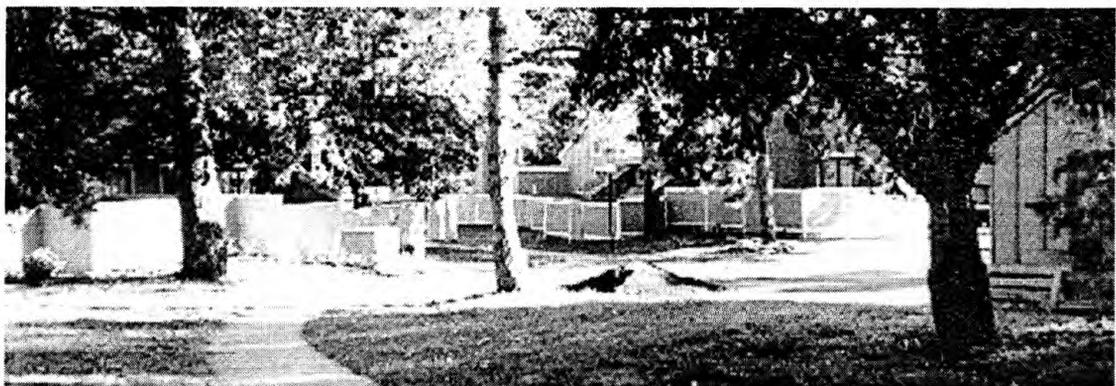


Figure 5.34 Extensive Fencing in Four Colonies

shake-roofs, and brick-and-fieldstone chimneys. Some multilevel units contain loft rooms and two-car garages at ground level. A three-and-one-half-acre commercial center is also finished with natural stained wood and stone in keeping with the rest of the development. Moreover, specifically designed light fixtures, mailboxes, trash receptacles, benches, and other outdoor equipment are in keeping with the development's overall architectural character. Further, the community is landscaped with evergreens and with an imaginative use of railroad ties and fieldstone for retaining walls. Finally, the configuration of the homes creates a sense of closure from the exterior perimeters of the site and a sense of community from the interior roads and walkways (Moore et. al., 1985, p. 77).

In terms of the community's relation to the larger metropolitan region, Four Colonies is located in the southwestern portion of the Kansas City metropolitan area and is near an industrial employment center. The site is also in a good location for commuters to downtown Kansas City.

In the next chapter, I review *Responsive Environments* and present how responsive environment qualities are used to evaluate these four study sites.

CHAPTER 6

REVIEW OF RESPONSIVE ENVIRONMENTS

This chapter discusses *Responsive Environments* and presents how the three larger-scale responsive environment qualities – permeability, variety, and legibility – are used to evaluate the four communities described in chapter 5.

In *Responsive Environments*, British urban designers Ian Bentley, Alan Alcock, Paul Murrain, Sue McGlynn, and Graham Smith (1985) introduce the concept of "responsiveness" of the environment. According to these authors, responsive environments are places that "provide [their] users with an essentially *democratic* setting, enriching their opportunities by maximizing the degree of *choice* available to them" (ibid. p. 9).

Responsive Environments is intended to be a practical manual for urban design by showing how to create such places. The authors' approach is based on the idea "that there are important relationships between social life and the arrangement of the built environment" (ibid. p. 144). The authors argue that "the tragedy of modern design ... is that designers never made a concerted effort to work out the *form* implications of their social and political ideals" (ibid. p. 9).

As a way to integrate the formal and lived qualities of the city, the authors of *Responsive Environment* establish a rational basis for design by introducing a seven-faceted definition of design responsiveness in terms of the following seven qualities:

- (1) *permeability*, i.e., the ease with which the pathways of an urban district allow users to get from one place to another in that district;
- (2) *variety*, i.e., the quality of an urban district that has different functional uses resulting in different building types and therefore attracting different users at different times of day and night;
- (3) *legibility*, i.e., the quality that makes a place mentally graspable and thus imageable and coherent cognitively;
- (4) *robustness*, i.e., the quality of a place that allows it to be used for many different purposes, thus offering its users more choices than places whose design limits users to a single fixed use;
- (5) *visual appropriateness*, i.e. the quality that creates visual meanings which suggest the practical function of a place;
- (6) *richness*, i.e., the quality that increases the variety of sense experiences which users can enjoy in the district; and
- (7) *personalization*, i.e., the quality that allows users to personalize a place and make it their own.

The authors argue that the best responsive environments have these seven qualities and offer, in the rest of their book, a set of design instructions for fostering each quality in the design of urban districts and neighborhoods. In the rest of this chapter, I discuss the first three responsive environment qualities in greater detail and explain how each is used to evaluate my four study sites. In addition, I briefly review the other four qualities and explain why they are not used as a means to understand the relative success of the four study sites.

1. Permeability

Permeability relates to the way that the pathway system of an urban district affects the ease with which people can get from one place to another. Only places that are accessible to people can offer choice; without physical accessibility to places, there is no choice. Unlike typical design principles that focus on forms from a static viewpoint, the concept of permeability is an experiential quality that involves movement and flow of the users and residents of the district. The concept is derived from Bill Hillier's (1983) theory of space syntax and Jane Jacobs' (1961) *The Death and Life of Great American Cities*. Both Hillier (1983) and Jacobs (1961) highlight cities with lively streets and seek to understand the underlying mechanisms that generate informal liveliness.

Hillier (1983) argues that the physical characteristics generating exuberant street life are directly related to permeability in traditional towns with lively streets. According to him, the core areas of traditional towns are easily accessible from their surroundings. In such a town, only one or two changes of direction are needed to reach a town center from outside. Street layout also offers a choice of routes from any point in the town to any other. Accordingly, the authors of *Responsive Environments* claim that permeability depends on the number of alternative routes, and they oppose hierarchical street layouts, which generate cul-de-sacs. This is because such street layout reduces permeability by diminishing the number of route choices (Bentley et. al., 1985, pp. 12-13).

Hillier also finds in traditional towns that building entrances face directly onto public space; thus, streets are lined by entrances to buildings, leaving few

blank walls. He points out that when the fluidity between building entries and the street is less, there are potentially fewer street encounters between people. The authors of *Responsive Environments*, then, apply this idea of perimeter development to permeability between urban public and private spaces. They argue that people need access across the interface because this interplay gives people more choice and enriches the public domain by increasing the level of activity between buildings and street (Bentley et. al., 1985, p. 12).

According to Jane Jacobs, diversity is the most important aspect of city vitality. She says that cities need "intricate and close-grained diversity of uses that give each other constant mutual support both economically and socially" (Jacobs, 1961, p. 14). She argues that one of the conditions required for useful city diversity is small blocks, which directly relate to permeability. She argues that most blocks must be small so that there are frequent opportunities to turn corners (ibid. p. 178). Because large blocks offer few alternative routes from which to choose, they tend to create stagnation and isolation. Jacobs says that large blocks "automatically sort people into paths that meet too infrequently, so that different uses very near each other geographically are, in practical effect, literally blocked off from one another" (ibid., p. 181). Jacobs not only advocates smaller blocks that create more pathways, but also she argues that these pathways need to be mixed and mingled with one another (ibid., p. 180). Using the same argument, the authors of *Responsive Environments* also emphasize the advantages of small blocks.

The liveliness of the city for Hillier and Jacobs, therefore, is partially a function of choice of routes and opportunity of encounter. The authors of *Responsive Environments* draw on Hillier and Jacobs by devising the phrase, "democratic setting," which suggests the maximization of user choice and opportunities.

Bearing these ideas in mind, I use permeability as one evaluation criterion for the four study sites by analyzing each community's positive and negative permeability characteristics in terms of access, connectivity, and route possibilities. In so doing, I focus on how each community's spatial layout affects the number of user choices as indicated by the pathway system, street layout, access points, intersections, aggregate street length, and the number, size, and shape of blocks. I examine the permeability of the four communities in chapter 7.

2. Variety

If all the places were the same in a district, even a large number of choices would be pointless because the user could only experience one thing. In other words, unless easily accessible places offer a choice of experience, permeability is irrelevant. Variety, therefore, relates to the choice of experience that places offer.

According to the authors of *Responsive Environments*, providing the widest appropriate range of uses is the key to increasing variety because this creates demand for places, which involves the range of activities that wants to be located there. Moreover, a wide range of uses implies varied building types and

forms, and attraction of varied people, which creates varied meanings, at varied times for varied reasons, and thus, they also provide a rich perceptual mix.

The concept of variety is based on Jane Jacobs' (1961) two conditions for generating diversity: aged buildings and mixed primary uses. Jacobs argues that to create flourishing diversity, old buildings are necessary and says that variety of buildings in age and condition must mingle in a district so that they vary in the economic yield they must produce. This means the minglings in living costs and tastes, and they are also essential to get stability in residential populations, as well as diversity in enterprises (ibid., p. 194). Corresponding to Jacobs, the authors of *Responsive Environments* argue that buildings in a variety of age and condition provides a variety of rents that attracts a variety of uses by attracting people and businesses in a variety of economic statuses.

Jacobs also argues that to generate diversity, mixed primary uses are necessary; more specifically, the district must serve more than one primary function, preferably more than two, and primary function must insure the presence of people who go outdoors on different schedules and are in place for different purposes (ibid., p. 152). Primary function is a use that attracts people in its own right. Dwelling or workplace concentration where people go to them on a daily basis are considered to be primary functions. Large stores or markets also can have a similar effect.

This condition is drawn from Jacobs' keen observation of the city. She perceptively identifies the mutual support between people who are drawn by primary uses on the street and small consumer enterprises. These small

businesses lack the pulling-power to attract people and live off the people drawn to the place by its primary uses, which Jacobs calls secondary diversity or secondary uses in *Responsive Environments*. They are dependent on the people going to and from throughout the day. Without these people, these small businesses disappear or never appear, (ibid., p.153) yet without these businesses, diversity cannot be achieved. Primary uses support secondary uses by creating pedestrian flow and foster those uses that need it. On the other hand, small enterprises are necessary for variety. Therefore, this mutual support is crucial for the liveliness of streets. The authors of *Responsive Environments* also emphasize the importance of the mutual support and interaction between activities over primary and secondary uses.

Jacobs points out that single land use zoning disables the mutual support between primary and secondary uses and fails street diversity by limiting land use into one function and one purpose. For example, she illustrates, a district mostly occupied by workplaces. In such places, secondary uses such as small businesses suffer from inefficient use of business hours; consumers visit these businesses at lunchtime only, and rest of the day is dead because there are no other primary uses such as dwellings. Accordingly, the authors of *Responsive Environments* argue that a mixture of primary uses such as work places and homes expands activity time and helps secondary uses such as restaurants and pubs by encouraging people to appear at different times on a street.

To use variety as the second evaluation criterion for the four study sites, I focus on land use and primary and secondary uses. I identify differences and

ranges of each item, and interpret the possible level of variety in each community. My discussion of variety is presented in chapter 8.

3. Legibility

The third quality that helps create responsive environments is legibility. According to the authors of *Responsive Environments*, legibility is a quality that makes a place mentally graspable and visually coherent as a physical environment. The concept of legibility is drawn from Kevin Lynch's (1960) pioneering work, *The Image of the City*. In his book, Lynch defines legibility as the ease with which its parts can be recognized and can be organized into a coherent spatial and environmental pattern (Lynch, 1960, p. 2-3). Drawing on Lynch's concept, the authors of *Responsive Environments* argue that residents and users need to recognize a district's layout and what is going on in that district because otherwise people cannot take advantage of the choices that qualities of permeability and variety offer. In other words, a place needs to be legible in order for them to appreciate its permeability and variety.

According to the authors of *Responsive Environments*, there has been a considerable decline in the degree of legibility from the past to present. Many traditional cities were legible, say the authors of *Responsive Environments*, and the biggest open spaces were related to the most important public facilities. The buildings that stood out from the rest were those of great public relevance. Many buildings allowed the passer-by to see the activities inside. Thus, pre-modern

communities typically had a legible layout from which users were able to form clear and accurate images.

However, mental images of a city held by its citizens have often become less coherent today. Legibility is reduced in modern design by the prevailing practice for designers to deal with all projects as if they were of equal public relevance. This leads to every unimportant office construction being designed as if it were the city hall or an important public building (Bentley et al, 1985, p. 145). Some buildings visually overwhelm publicly important places and facilities. This also confuses important activity patterns.

To examine this kind of shift in mental images more specifically and systematically, Lynch explored the contents of mental images by interviewing and getting people to draw maps from memory. He found that, although each individual's mental pictures are unique, there are also shared images, and certain sorts of physical features play a key role in the content of these shared images. He then classified these features into five types of elements that refer to physical form. These elements, Lynch says, closely relate to a visual quality of the apparent clarity of the cityscape, and legibility is largely depending on these five elements. They are:

- (1) *Paths*, i.e., the channels of movement in a place. They may be streets, alleys, walkways, railroads, transit lines, and canals. These are predominant elements in many people's mental image. People observe the city while moving through it; along these paths, other elements of the place are arranged and related in users' minds.

- (2) *Nodes*, i.e., focal points into which an observer can enter. They may be enclosed squares, places of a break or junction in transportation, a crossing or convergence of paths, and moments of shift from one structure to another.
- (3) *Landmarks*, i.e., the point-references that are experienced from outside. They are usually a rather simply defined physical object such as a building, sign, store, or mountain.
- (4) *Edges*, i.e., linear elements that are not used or considered as paths by the observer. They are boundaries between two phases and linear breaks in continuity such as shores, rivers and other topographical edges, railroad cuts, railway viaducts, elevated highways, walls, and edges of development.
- (5) *Districts*, i.e., medium-to-large sections of the city recognized as having some particular identifying character. They are conceived of as having two-dimensional extent so that the observer can mentally enter “inside of,” for example, a neighborhood, park, or plaza.

In a city with a high degree of legibility, these five elements are easily identifiable and grouped into an overall pattern (Lynch, 1960, p. 3). Drawing on Lynch, the authors of *Responsive Environments* suggest using these elements in the urban design process to create potentially legible environments, which support responsiveness. They say that thinking in terms of these five elements helps designers analyze image-forming features (Bentley et al, 1985, p. 45).

Considering that legibility of physical form is subject to visual clues of what is inside and maximum distance for recognition, Lynch's five elements may be an appropriate representation of legibility. For that reason, drawing on my own image analysis of the four communities studied, I use these elements as evaluation criteria for legibility. In so doing, I identify the arrangement and number of paths, nodes, landmarks, edges and districts by looking at any existing forms that may be used to make the place more legible within the site and any nearby areas that can be seen from the site. I will present my discussion of the four communities' legibility in chapter 9.

The Four Responsive Environment Qualities Not Used for Evaluation

As explained above, there are four other responsive environment qualities – *robustness*, *visual appropriateness*, *richness*, and *personalization* – that will not be evaluated in the present thesis because the focus here is larger-scale environmental elements like pathway structure and land use.

Robustness, according to the authors of *Responsive Environments*, is a quality that offers the widest possible range of choice through buildings and other places that can be used for many different purposes over a period of time. Places with robustness offer their users more functional choice than places whose design limits them to a single fixed use. Thus, the design aim is to make spatial and constructional elements suitable for the widest possible range of likely activities and future uses both in the short and the long term.

The second responsive environment quality not used as an evaluative criterion is visual appropriateness, which, according to the authors of *Responsive Environments*, is a quality that uses architectural elements to make people aware of the functions, uses, and activities of buildings and open spaces of a district. Visual and architectural appearance is important in terms of people's interpretation of a place as having environmental and place meaning. The authors of *Responsive Environments* argue that architectural expression can reinforce the responsiveness of a place by supporting its legibility, variety, and robustness (Bentley et al., 1985, p. 76). When architectural expression helps make people aware of the choices offered by these other qualities, a place has visual appropriateness.

Architectural appearance can be designed to reinforce a district's legibility and can help people read the pattern of uses that district contains. Building façades can also be designed to reinforce variety and help a wide range of uses to co-exist in an area by making the architectural image of the area seem appropriate as a setting for each of the uses concerned. Moreover, by looking appropriate, well-designed buildings reinforce the robustness that potentially accommodates a wide range of uses in a district.

The third responsive environment quality not used as an evaluative criterion is richness, which, according to the authors of *Responsive Environments*, is a quality that increases the choice of sense-experiences that users can enjoy. A rich environment offers a wide range of sensory choices by using appropriate materials and construction techniques. In such an

environment, people can choose different sense experiences by changing position or by focusing on different sources of environmental experience.

Although most of the information is channeled through eyes, other senses such as motion, smell, hearing, and touch also have design implications. Thus, richness is not a purely visual matter but involves both visual and non-visual elements of environment. Nonetheless, visual richness is the most important because vision is the most dominant sense in terms of information input, and the one most under control; people only have to move their eyes to change what they look at (Bentley et al, 1985, p.89). For example, visual richness partly depends on the presence of visual contrasts on surfaces; such visual contrast is created by differences of colors and tone or by three-dimensional variations. Many buildings from the past have visual richness with much presence of visual contrasts while many recent environments are filled with visual homogeneity that often becomes monotonous. Nevertheless, the authors of *Responsive Environments* argue that there is a limitation in copying the past. They say, “The pastiche approach to richness is no help in that situation [visual monotony]” (ibid, p.90), and they seek building design whose images are not based on those of rich architecture from the past but rather based on logical reasoning generating visual variety.

The last responsive environment quality not used as an evaluative criterion is personalization, which, according to the authors of *Responsive Environments*, is the possibility whereby a user can change or modify the environment to reflect his or her personality. Personalization thus involves

changing the image of a place for personal ends. People personalize a building's image to affirm their own tastes and values, or they correct an existing image, believing it is inappropriate. An appropriately personalized environment supports legibility by making a place's pattern of activities clearer. In a robust environment, which accommodates a wide variety of uses, such personalization can make each use in a building and district explicit.

Personalization, more importantly, supports responsiveness by promoting the users' choice of creative activities. Public participation in environmental design is highly desirable, argue the authors of *Responsive Environments*. However, they say, that even with the highest level of public participation, most people still have to live and work in places designed by others, and personalization is the only way most people can achieve an environment that bears the stamp of their own tastes and values (Bentley et al., 1985, p.99). In addition, to develop truly participatory relationships for people with places, users must become actively involved with the place, initiating and completing the personalization process themselves.

Justifying the Use of Larger-Scale Responsive Environment Qualities Only

The design of physical and spatial form affects the choices users make at many levels, and *Responsive Environments* hopes to maximize user's choices through its seven design qualities. Each quality sheds light on various aspects of choice in terms of scale and time. Multiplicity of choice supported by these

seven qualities increases the potential of human interaction and thus potentially contributes to an increased social life in a district.

Although all the seven qualities are intricately connected and interdependent, there is a distinction between larger-scale qualities and smaller-scale qualities. In other words, the first three qualities – permeability, variety, and legibility – are considered to be larger-scale qualities, while the other four qualities – robustness, visual appropriateness, richness, and personalization – are seen as smaller-scale qualities. Larger-scale qualities like pathway structure and land use affect the more fundamental and overall level of an environment, while smaller-scale qualities involve less permanent and more continuously modifiable elements like individual buildings, signs, and façade details.

This distinction between larger-scale and smaller-scale environmental elements indicates the hierarchical nature of these qualities. For example, a larger-scale responsive environment quality like permeability is followed by variety, which in turn is followed by legibility; the existence of permeability comes first and thereby promotes and enhances the possibility of variety and legibility, provided all these qualities are also accounted for in the design process.

Alexander et al. (1977) and Hillier and Hanson (1984) agree on a hierarchy of importance running from global (larger-scale) to local (smaller-scale). According to Alexander et al., global structure defines community, while local patterns embellish the structure by giving shape to buildings and the spaces between buildings (*ibid.*, xviii, 1977). Hillier and Hanson argue that global structure is the determining factor of social order (*ibid.*, 1984), saying that “the

global organization of space that acts as the means by which towns and urban areas may become powerful mechanisms to generate, sustain and control patterns of movement of people” (Hillier, 1983, p. 49). Both sets of researchers “insist that programming must first identify and design for large-scale concerns before dealing with smaller-scale issues” (Seamon, 1994, p. 45).

Further, Hillier (1983) argues that, even though the designer should first understand the *global* properties of spatial patterns, too often the designer’s perspective is too *local*, since “most modern architectural and planning practice are oblivious to the global level and consider only the locality or individual architectural forms” (Seamon, 1994, p. 43). Probably because larger-scale qualities are not as obvious as smaller-scale qualities, larger-scale qualities do not receive as much attention by both users and designers, while easily perceptible smaller-scale qualities of the streetscape receive much attention. Planners, who theoretically should be alert to larger-scale qualities, are often too caught up with traffic engineering and economy but not the social life of a district. What is missing, therefore, is recognition of these often-unnoticeable larger-scale qualities that nevertheless, are indispensable for the success of the more familiar smaller-scale qualities.

For that reason, this thesis focus is on the larger-scale responsive environment qualities that are less visible yet crucial for actualizing the potential of a place. These larger-scale qualities have a much more permanent effect on a place, since – when a larger-scale structure like a pathway system is built – it becomes difficult to make alterations.

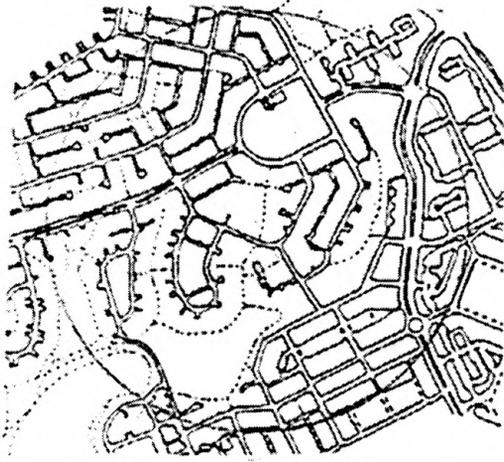
Selecting the Study Sites

In the following analysis of the three larger-scale responsive environment qualities of permeability, variety, and legibility, it was impractical to evaluate the four full-sized communities because they are of varying areal extents and different geographical layouts. Therefore, a 125-acre circular unit with a radius of 1/4 mile was chosen, using as a center the core of each community's central neighborhood. By this method, each community could be precisely compared and contrasted. The resulting study sites are illustrated in the maps of figure 6.1.

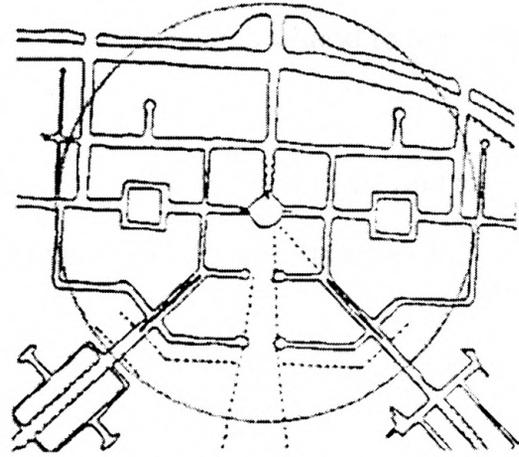
The specific size of these study units is based on Murrain's (1993) description of a basic neighborhood unit:

[A] basic neighborhood unit has an approximate 400 meter [1/4 mile] radius which equates to an area of approximately 125 acres. This radius represents a comfortable walking distance for able-bodied people... The 'center' will vary from local facilities and a public transit stop to a local high street or a new town center... This is in fact a description of many traditional city districts or neighborhoods (ibid., 1993, p. 89).

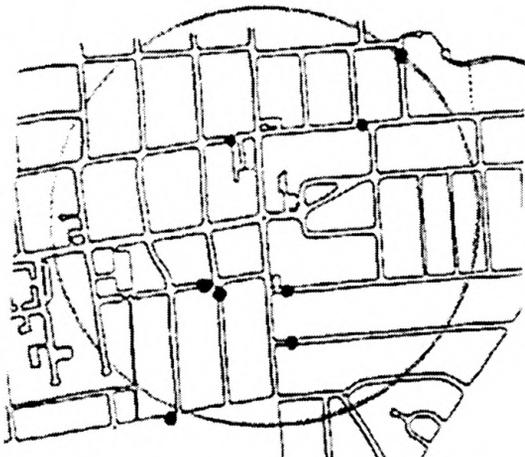
This concept of neighborhood unit originated from planner Clarence Perry's 1929 neighborhood unit design theory, which defined the ideal neighborhood by the number of families need to support an elementary school. Perry "drew a circle, representing the area covered within a five-minute walking distance of a central point" (Barnett, 2000, p. 74). New Urbanists Duany and Plater-Zyberk's neighborhood standards are based on Perry's theory, thus they adapt the same 1/4 mile radius (ibid., p. 76). As Plater-Zyberk (2000) explains, "the ideal size of a neighborhood is a quarter-mile from center to edge, [which is]



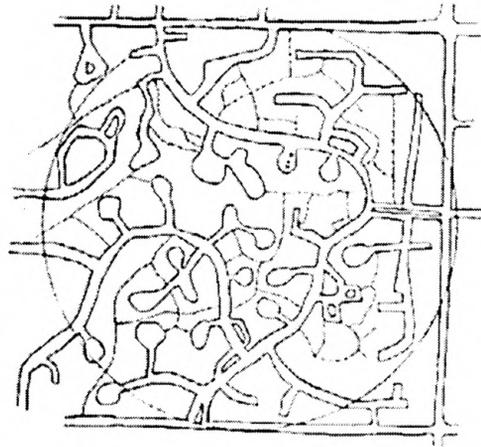
Map A Kentlands



Map B Laguna West



Map C Elmwood



Map D Four Colonies

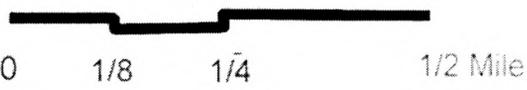


Figure 6.1 The Four Study Sites

equivalent to a five-minute walk at an easy pace. Within this five-minute radius, residents can walk to the center from anywhere in the neighborhood to take care of many daily needs or to use public transit” (ibid., 2000, p. 81).

Therefore, this quarter-mile radius neighborhood unit is a basic unit for New Urbanist designers, and the evaluative use of this unit seems entirely appropriate in the present study.

CHAPTER 7

PERMEABILITY AND THE FOUR COMMUNITIES

As explained in chapter 6, permeability is the ease with which the pathways of an urban district allow users physically to get from one place to another in that district. Only places that are accessible to people can offer choice and route variety; without physical accessibility to places, there is no choice. To support responsiveness of the environment by maximizing users' choice and opportunities, permeability is the most essential quality and, according to the authors of *Responsive Environments*, must be considered first.

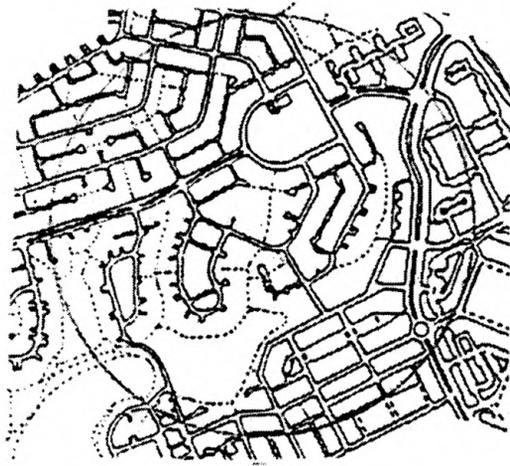
Permeability depends on the number of alternative routes through a district. Therefore, pathway system, street layout, access points, intersections, and lineal feet of streets are keys to permeability because these elements relate to choices of routes from any point in the town to any other. Small blocks also directly relate to permeability. When most blocks in a district are short, there are frequent opportunities to turn corners. In contrast, large blocks offer few alternative routes from which to choose, so they tend to create stagnation and isolation.

Bearing these ideas in mind, in this chapter I examine the degree of permeability for the four communities studied in this thesis. I do a series of analyses, each of which concludes with a ranking of each community's permeability in terms of "high," "medium," or "low." These analyses draw on a

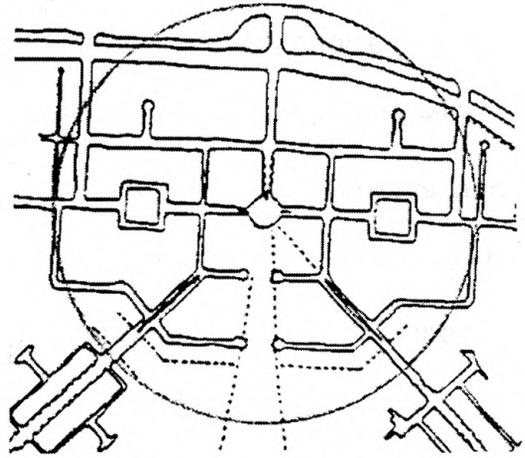
consideration of each community's pathway system and a series of map readings that include the interpretation of street pattern, access points, intersections, pathways, and blocks along with several numerical indicators that may help to identify the relative degree of permeability for each community. These analytic themes, ordered roughly from large scale to smaller scale, are: (1) pathway system, (2) street patterns, (3) access points, (4) intersections, (5) aggregate street length, and (6) number, size, and shape of blocks. Each theme is discussed in turn.

1. Pathway system

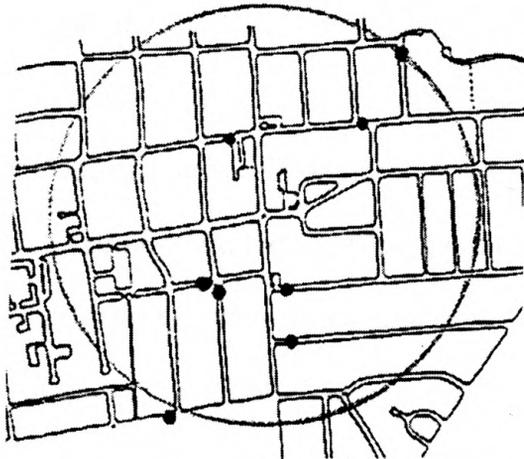
As shown in map A of figure 7.1, Kentlands has a greater interconnection of streets and a less pronounced street hierarchy than conventional low-density suburbs like Four Colonies, shown in map D of the same figure. Networks of pedestrian and bicycle paths are well connected in Kentlands partly because alleys are incorporated in the circulation system, yet there are some loops and cul-de-sacs because of the site's irregular topography. Nonetheless, most of Kentlands' housing units are more than a five-minute walk from the retail shops due to the development's size and the position of Kentlands' retail component near the southeastern corner of the community. Street-design-wise, there is the use of formal elements – for example, a divided boulevard connecting the west entry circle at the school site with the semicircular recreation center site. Also at several points, landmark structures effectively terminate vistas, for example, the vista of the recreation center at the end of the divided boulevard.



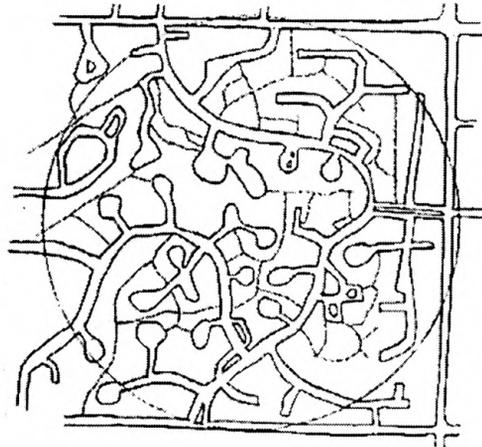
Map A Kentlands



Map B Laguna West



Map C Elmwood



Map D Four Colonies

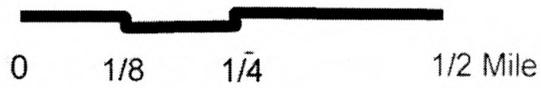


Figure 7.1 Pathway System (all plans at the same scale)

Likewise, as illustrated in map B of figure 7.1, streets in Laguna West also provide a considerable number of connections and a variety of choices. This is because the circulation system in Laguna West incorporates off-street paths such as gravel jogging trails, a waterfront promenade, on-street bikeways, and pedestrian bridges. In spite of these ingenious features, however, distances to many retail and service centers at Laguna West are too great to expect most residents to walk to them on a regular basis. Moreover, helped by rather infrequent local bus services, most residents are likely to use an automobile to get to most destinations just as residents in other lower density suburbs.

As indicated by map C of figure 7.1, Berkeley's Elmwood has a street pattern that is a modified rectilinear grid made up of blocks of varied size. Most street intersections are four-way, which may contribute to high street connectivity. Although concrete planters, or "Berkeley Barriers," have been introduced and created some cul-de-sacs, these are not obstacles for pedestrians and bicycles to pass through. In addition, it is convenient to walk to nearby stores and other requirements partly because the centrally located shopping district provides excellent access to the residents.

As illustrated by map D of figure 7.1, Kansas City's Four Colonies has a typical suburban street system with intricate pedestrian pathways that are almost completely segregated from the streets. Major collector streets bound each district or "colony," which are developed around cul-de-sacs and loops. The single-family homes of Four Colonies are arranged in clusters around shared driveways, with four or five units to a cul-de-sac. Townhouses and patio houses

are also clustered on private courts to discourage through traffic. Unlike the centrality of Elmwood, Four Colonies' closest shopping area is located on the northeastern corner of the community. Although this area is accessible both from inside and outside the development, the distance is too great to walk for people who are in the southwest district of Four Colonies.

Examining the pathway system reminds us that domination of automobile use is taken for granted in the pathway designs of the four communities. Although all four plans have arrangements for pedestrians such as sidewalks and walkways, most of them seem to be only a recreational use except in Elmwood. While Elmwood's close proximity to necessities encourages residents to use alternative transportation such as walking and bicycles, the other three communities more or less leave no choice other than using an automobile to reach basic needs. Moreover, specialized pedestrian paths are "built-ins" and limit the interaction between auto users and pedestrians. The irony may be that such pathway systems reinforce automobile use and, therefore, discourage alternative ways to traverse the site. In this sense, Elmwood has the most permeable pathway system while Four Colonies has the least. In between are Kentlands and Laguna West, which, besides specialized pedestrian paths, both have sidewalks along streets.

Based on the preceding analysis, I rank Elmwood's permeability as high, Kentlands' and Laguna West's as medium, and Four Colonies' as low.

2. Street Patterns of the Four Communities

The maps in figure 7.2 use the street patterns of the four communities to divide the sites into sub-areas of potential movement that I call “sectors.” Based on the relative ease with which a site can be divided into sub-areas on the basis of pathways, these sectors are another way to examine the relative permeability of the four communities. As illustrated by figure 7.2A, in Kentlands, there are roughly three different street patterns that are juxtaposed from northwest to southeast: a northwestern sector, a middle sector, and a southeastern sector. At first glance, one expects a sense of movement between the northeastern and southwestern sectors. However, this movement is limited; the sparsely placed streets in the middle sector separate the other sectors and minimize connectivity. As a result, there is minimal continuity between the northwestern and southeastern sectors. In short, one would expect Kentlands to be only partially permeable.

As illustrated by figure 7.2B, Laguna West's street pattern may be characterized as formal with a strong sense of movement in an east-west direction. As a matter of fact, most of Laguna West's access points are on its east and west sectors, which should support easy movement in these directions. However, there is potentially less movement between Laguna West's east-west and south sectors because of few streets in these directions. If a person plans to travel from north to south in Laguna West, he/she could not move directly but would have to follow an irregular route. Therefore, permeability seems to be limited largely in an east-west direction.

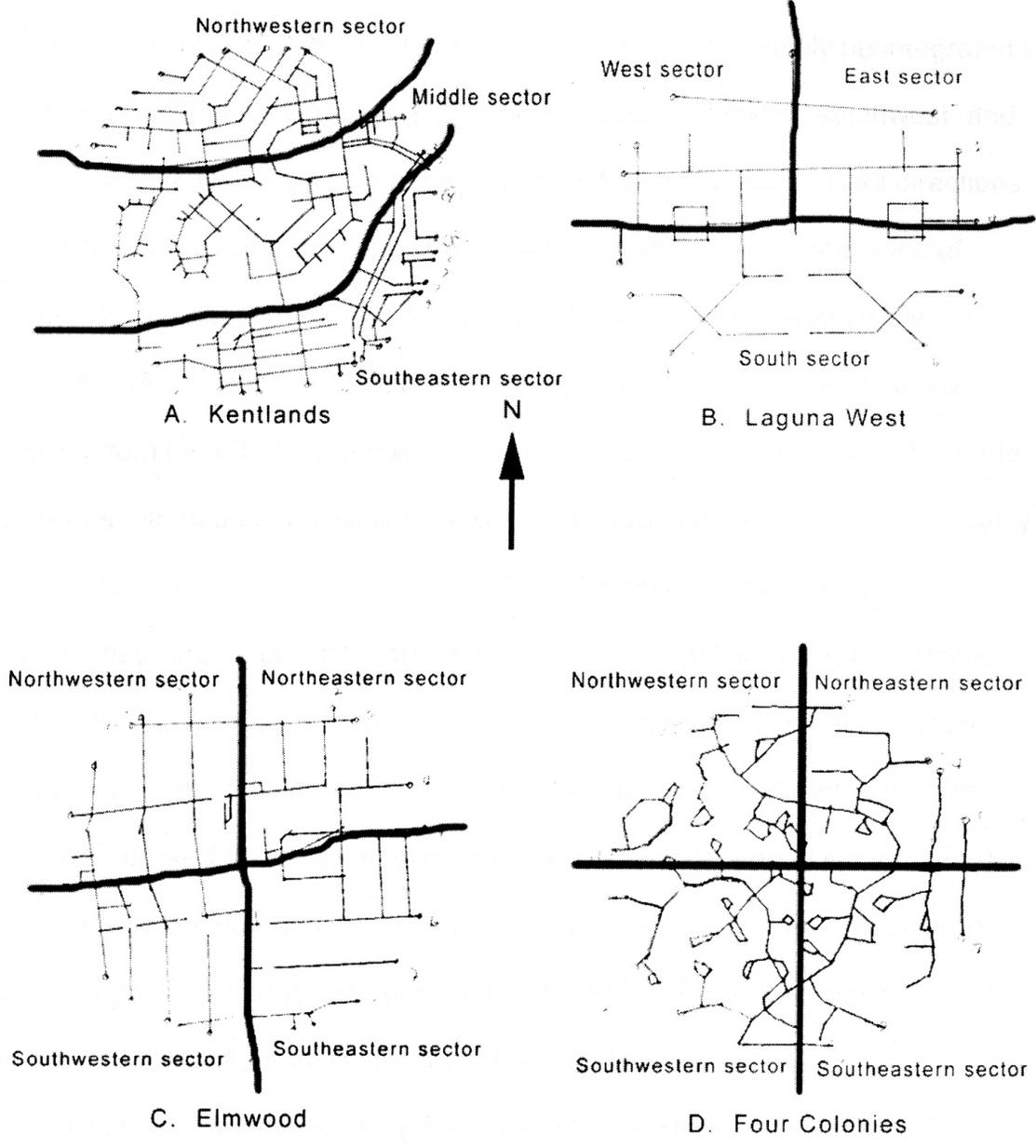


Figure 7.2 Street Patterns

In contrast, as shown in figure 7.2C, the streets in Elmwood express strong connectivity in all directions, and the study site can readily be integrated in terms of forms interpenetrating sectors of northeast, northwest, southwest, and southeast. Elmwood appears to be fluid, and people can move in all directions with ease; moreover, many long straight streets give people a clear view of where they are heading. In this sense, permeability is strong and visible.

As shown in figure 7.2D, Four Colonies' street pattern is distinctively different from the other three communities. A division into sectors can be made by north-south and east-west lines, though this arrangement is entirely arbitrarily and unrelated to the actual pathways of Four Colonies. While the other communities' streets consist more or less of long straight lines, Four Colonies' streets involve short curved lines, which create an organic look. Accordingly, movement in Four Colonies appears to be circuitous and confined to the site. Moreover, unlike Elmwood's strong potential to integrate among sectors, Four Colonies' sectors do not have much connectivity with each other. Most streets do not seem to lead anywhere despite the existence of many access points to the site. As a result, there is little feel of permeability.

Each community's street pattern seems to express a unique sense of movement. Elmwood's strong permeability is reflected in its street pattern consisting of many long straight lines, while Four Colonies' weak permeability is a reflection of the circuitous nature of the streets. How streets are distributed also affects the sense of movement. Kentlands' uneven distribution of streets may weaken the sense of movement; likewise, Laguna West's low street density

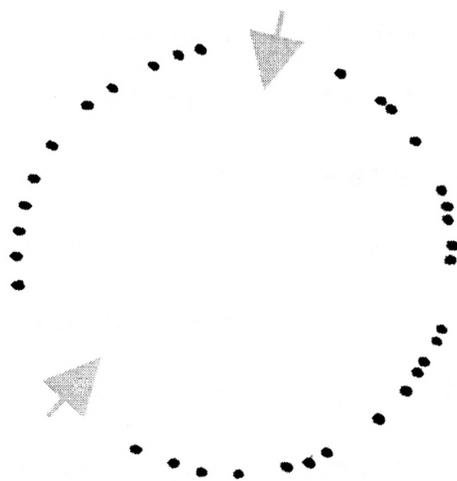
may not help create a sense of movement. In contrast, Elmwood's well-balanced street distribution and density contribute to the community's strong permeability and strong sense of movement. Kentlands and Laguna West, nevertheless, have some permeability with a partial sense of movement, while Four Colonies' confusing shifts in pathway direction only show weak evidence of permeability.

Based on the preceding analysis, I rank Elmwood's permeability as high, Kentlands' and Laguna West's as medium, and Four Colonies' as low.

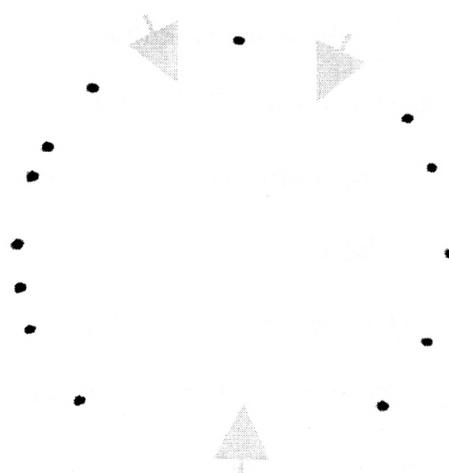
3. Access Points

The number of access points in a development can be used to provide another helpful indication of the development's degree of linkage to its larger surrounding area. An access point is the first point of encounter through which a person enters the site. Potentially, the larger the number of access points, the more connected the site is to its surroundings and, thus, more permeable. Nevertheless, the spatial distribution of access points and the characteristics of access also need to be examined because how the access points are distributed may have significant effects on permeability. When access points exist evenly on a development's perimeter, entrance and exit is more likely possible from all directions. Such an even distribution pattern implies equal accessibility in many directions, thus, a more equitable setting in terms of potential freedom of movement for users.

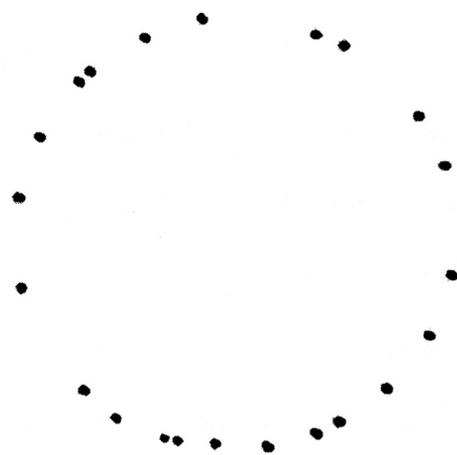
Maps in figure 7.3 illustrate the number of access points for each study site and how these access points are distributed on the sites' perimeters. As



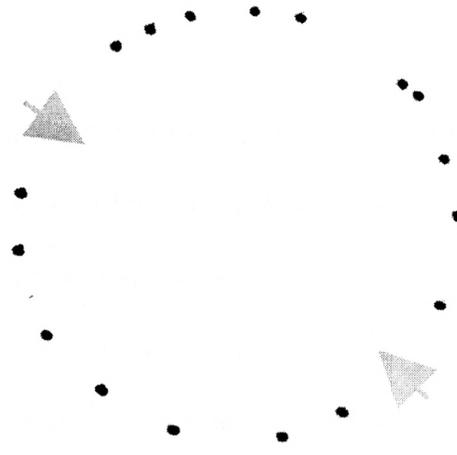
A. Kentlands
(33 access points)



B. Laguna West
(13 access points)



C. Elmwood
(22 access points)



D. Four Colonies
(17 access points)



Figure 7.3 Access Points

illustrated in figure 7.3A, Kentlands has 33 access points – the most among the four communities. The second most is Elmwood's 22 points as illustrated in figure 7.3C; the next is Four Colonies' 17 points as in figure 7.3D; and the least is Laguna West's 13 points as in figure 7.3B. On the basis of raw number of access points, Kentlands appears to be the most permeable, yet Elmwood's almost even distribution clearly contributes to its multi-directional permeability north, east, south and west. In this regard, Kentlands' two gaps in the north and southwest are an obvious potential barrier in linking to the larger surroundings. Likewise, Four Colonies' two gaps in the northwest and southeast weaken the linkage to the surroundings coupled with a smaller number of access points. Laguna West has even larger gaps between access points in the north and south, a situation which severely weakens permeability in the north-south direction.

Again, Elmwood's well-balanced distribution of access points expresses strong permeability. Kentlands' access distribution, although outnumbering other communities, suggests an accessibility to the surroundings hampered by gaps at the north and southwest. Likewise, Four Colonies' pattern of access points indicates the community's limited connectivity to the surroundings, while Laguna West's considerable number of gaps suggests the site must be isolated from its larger context, at least in terms of access points.

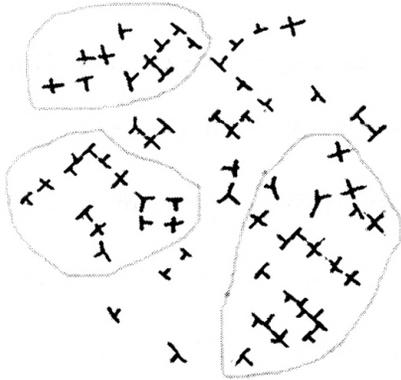
Based on the preceding analysis, I rank Elmwood's permeability as high, Kentlands' and Four Colonies' as medium, and Laguna West's as low.

4. Intersections

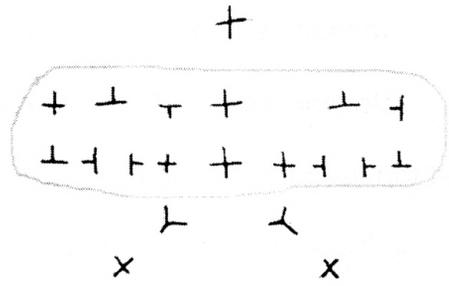
An intersection is a point of choice; at least theoretically, the more intersections in a district, the more alternative possibilities for movement through that district. Overall, the choice of movement possibilities increases as the number of intersections increase, and potentially, the more choice available, the more district permeability. Maps in figure 7.4 illustrate the intersections for each study site and whether these intersections are distributed in a more or less orderly fashion (areas of greater spatial order are circled). As illustrated in figures 7.4A-D, Kentlands has the most intersections with 71. Four Colonies has the next most, with 41; Elmwood, with 37; and Laguna West, with 20.

On the bases of raw number of intersections, Kentlands seems to be the most permeable; however, similar to the situation of access points discussed in the last section, analysis of the spatial distribution of the intersections says much about permeability. When intersections are distributed evenly through a site, the pathway choices are also more likely to be distributed evenly because the setting is potentially more permeable. Moreover, how intersections line up suggests the relative degree of connectivity among intersections. When intersections line up in a regularly manner, they are likely to be well connected, thus, more permeable. In contrast, when intersections line up randomly with less larger-scale correctedness, intersections are likely to be more independent, more isolated, and less permeable.

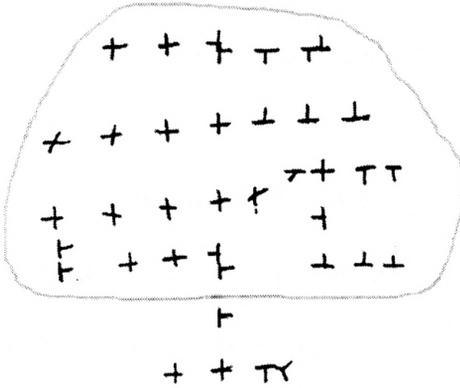
In this regard, as shown in map C, Elmwood's evenly distributed intersections, along with a strong sense of order, express high permeability. On



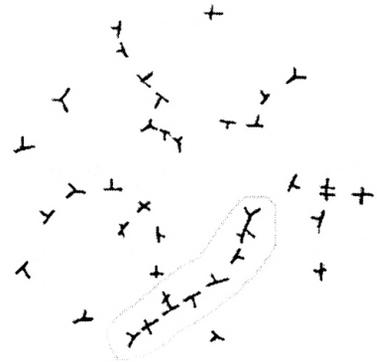
A. Kentlands
(71 intersections)



B. Laguna West
(20 intersections)



C. Elmwood
(37 intersections)



D. Four Colonies
(41 intersections)

 Sub-areas of greater order

Figure 7.4 Intersections

the other hand, Kentlands' distribution, as shown in map A, is uneven and includes sub-areas of greater and lesser order. Over all, there is a minimal sense of regularity for Kentlands' intersections, except for the three pockets circled on the map A. Permeability may be high in these pockets yet may not be strong as a whole despite the large number of intersections. As indicated by map D, Four Colonies' intersections are unevenly distributed to a degree considerably greater than Kentlands'. There is little sense of order at any spatial level for Four Colonies, and the result is disjuncture among intersections and weak permeability. In contrast, Laguna West's intersections are by far the fewest, but they have a clear sense of order and an even distribution in the core area. The number of intersections is particularly few in the north and south sub-areas of the site, and this paucity undermines Four Colonies' permeability as a whole.

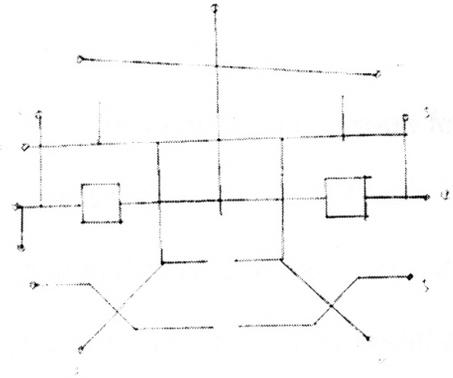
On the basis of this analysis of intersections for the four sites, Elmwood's permeability can be ranked as high, Kentlands' and Laguna West's as medium, and Four Colonies' as low.

5. Aggregate street length

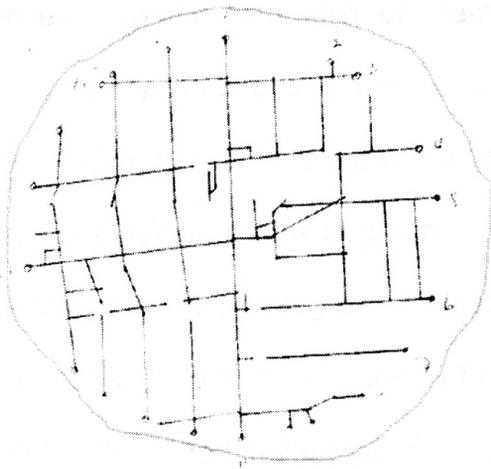
Because streets are the medium for movement, the more streets in a district, potentially, the easier and more permeable the movement. As illustrated in figure 7.5, Kentlands has the longest length of streets with 42,086 feet; this figure well surpasses the total street length of the other three communities: Four



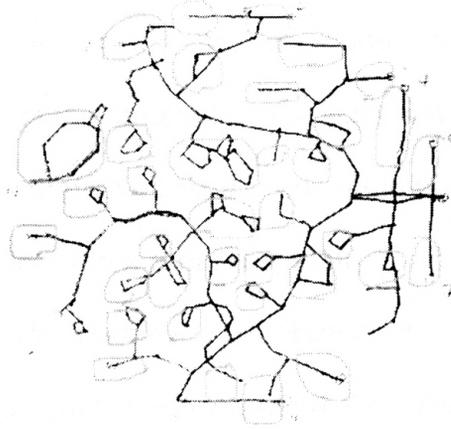
A. Kentlands
(42,086 feet of streets)



B. Laguna West
(17,890 feet of streets)



C. Elmwood
(26,884 feet of streets)



D. Four Colonies
(29,782 feet of streets)

 Area of greater spatial integration

Figure 7.5 Aggregate Street Length

Colonies, with 29,782 feet; Elmwood, with 26,884 feet; and Laguna West, with 17,890 feet.

Also significant for permeability is the fact that the linear street footage for each study area provides some indication of the relative street density of each community. As shown in map A of figure 7.5, Kentlands' streets appear to be the densest in terms of their spatial extension through the study area. In contrast, as indicated in map B, streets in Laguna West appear to be much fewer, corresponding to its small number of lineal feet. As already said, Elmwood and Four Colonies are in between Kentlands and Laguna West, and as suggested by map C and D of figure 7.5, this medium placement is reflected in an "in-between" spatial distribution of streets in the two sites.

We can next examine the street distribution in study site. More precisely, maps A-D in figure 7.5 illustrate the distribution of the streets for four sites and also mark out sub-areas of greater street concentration. These areas have been identified by a higher degree of street aggregation and a greater spatial homogeneity. Map A indicates that Kentlands has an uneven distribution of streets. As circled in the map, there are several smaller concentrated sub-areas, and the street density in these sub-areas is very high. At the same time, however, connections among these sub-areas appear to be weak. In effect, Kentlands' distribution of streets seems to have created several independent street units in the site, and thus it can be said that Kentlands' permeability is not site-wide but fragmented into these smaller spatial parts.

As indicated in map D, Four Colonies' considerable lineal footage results from the winding nature of the street pattern and numerous cul-de-sacs. Although the distribution of streets seems to be fairly even throughout the entire study area, the weak connectivity is evidenced by persistent dead ends and loops. The implication here goes beyond Kentlands' sectional independence; for Four Colonies, each cul-de-sac and loop maintains its own spatial autonomy and isolation. Four Colonies, therefore, can be described as a conglomeration of fragmented pieces of development with no wholeness, which may be a reflection of the modern, low-density suburban planning ethos that conceived the development originally.

As shown in map C, although Elmwood has a shorter lineal footage than Kentlands or Four Colonies, street distribution is more even, and the interconnectedness is strong with no sectional divisions. In this sense, Elmwood may be more permeable than its amount of lineal footage suggests. Elmwood's relatively small aggregate street length results from straight streets that integrate the entire site efficiently with the shortest possible extent of streets.

As illustrated in map B, Laguna West also has a fairly even spatial distribution of streets with permeating straight streets and no particular sectional divisions. As already said, however, Laguna West's sparse layout of streets reflects the least linear footage of the four study sites. This layout impairs interconnectedness and permeability by weakening the district's spatial cohesiveness as a whole. Accordingly, the amount and pattern of streets in

Laguna West does not hold the site together and expresses a spatial centrifugality with no areas of greater street integration.

As already suggested above, in terms of total street length, Kentlands would seem to be the most permeable followed by Four Colonies. However, the way streets aggregate in these developments results in sectional divisions that undermine the districts' permeability as a whole. Especially, Four Colonies' small fragmented pieces of development are totally in opposition to permeability. In contrast, Elmwood's street system effectively holds the site together without any sectional divisions, while Laguna West is the most disconnected permeability-wise because of its sparse street density.

On the basis of aggregate street lengths considered in terms of relative spatial integration, therefore, I rank Elmwood's permeability as high, Kentlands' as medium, and Four Colonies' and Laguna West's as low.

6. *Number, size, and shape of blocks*

The number and size of blocks are good indicators of degree of permeability. Numerous small blocks in a district suggest strong permeability, while a few large blocks may signal weak permeability. This is because when most blocks in a district are short, there are frequent opportunities to turn corners. In contrast, large blocks offer little alternative routes to choose, so they tend to create stagnation and isolation. In addition, the number of blocks is in reciprocal relation with block size; the smaller the size of blocks, the larger the number of blocks in a given area, and vice versa. Areas being equal, the greater

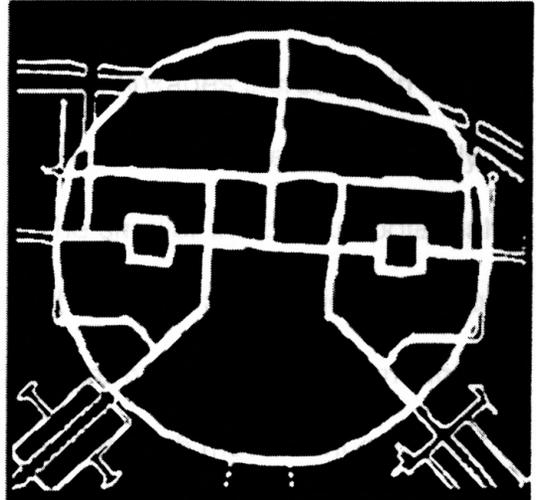
number of blocks, the smaller they are, with the result that users are given more choices of routes at least potentially. Conversely, the same sized site with fewer blocks is a site with larger blocks, which give users less choice of routes, thus, potentially, less permeability.

The maps in figure 7.6 illustrate each study site's block configuration. To illuminate the shape and the size of each block, street patterns are simplified in these maps by not including cul-de-sacs. This is because a block, by definition, is an area of land bounded on each side by a street. Clearly, cul-de-sacs do not establish a complete block boundary.

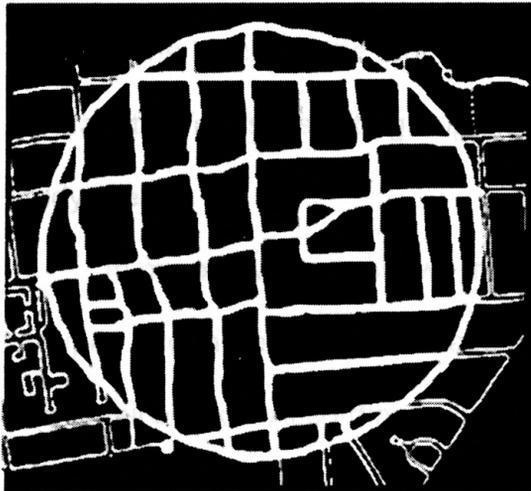
As the maps A-D of figure 7.6 indicate, Kentlands has the most blocks with 55, followed by Elmwood, with 41 blocks. With many fewer blocks, Laguna West and Four Colonies follow, with 18 blocks and 8 blocks respectively. These block counts are related to aggregate street length and pattern. As illustrated in map A, Kentlands' large number of blocks, many of which are small, results from Kentlands' large aggregate street length and intricate street pattern. As illustrated in map C, Elmwood's grid street pattern also generates many small blocks despite the relatively small aggregate street length. In contrast, as shown in map B, Laguna West's permeability is limited due to the small number of blocks, many of which are large and resulting from small aggregate street length. As demonstrated in map D, Four Colonies' minimal number of blocks with large size also suggests curtailed permeability. This results from Four Colonies' numerous cul-de-sacs and loops, which do not establish the boundaries of blocks despite the relatively large aggregate street length.



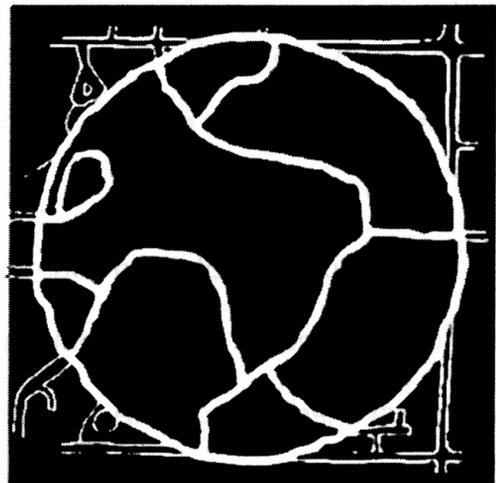
Map A Kentlands
(55 blocks)



Map B Laguna West
(18 blocks)



Map C Elmwood
(41 blocks)



Map D Four Colonies
(8 blocks)

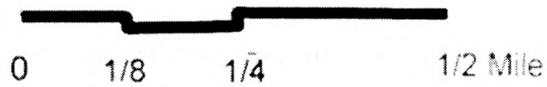


Figure 7.6 Blocks

Similar to the number of blocks, the size of blocks is also related to the pathway system. If the number of routes and their linkages increases in a given area, the size of blocks is likely to decrease. Therefore, smaller blocks imply more routes and more choice of movement. The smaller the blocks, potentially, the easier the movement from one junction to the next in all directions (Jacobs, 1961, Bentley et al, 1985); thus, smaller blocks are typically more permeable. On the other hand, large-scale blocks work against such movement and are, thus, less permeable.

As explained above, the relationship between individual block size and permeability is clear; however, evaluating entire study sites and determining which community is more permeable as a whole requires further analysis because the blocks in the four study sites vary in size. One way to compare and contrast the four sites is to group blocks by size and see the distribution for each study area.

In my analysis, as shown in table 7.1, each block for the four sites is grouped into three categories based on Jane Jacobs' (1961) description of large and small blocks. According to Jacobs, at least in American cities, a large block's longest side is typically 700-800 feet long, while a small block's longest side is typically 400-420 feet long. In my groupings presented in table 7.1, a block with the longest side less than 500 feet is categorized as small, a block with the longest side between 500 feet and 700 feet as medium, and a block with the longest side more than 700 feet as large. Table 7.1 thus shows how many blocks

are small, medium, and large for each study site and the acreage these size blocks cover.

When we look at the number of blocks grouped into the three sizes for the four study sites, Kentlands still appears to be the most permeable community with 40 small blocks and 8 large blocks. Elmwood is the second most permeable with 22 blocks; Laguna West, third with 7; and Four Colonies the least permeable, with 2. This ranking is exactly the same as the previously discussed ranking of total number of blocks for the four sites.

	Kentlands		Laguna West		Elmwood		Four Colonies	
	Number of blocks	Number of acres						
		Percent of total						
Small*	40	39	7	15	22	38	2	4
		31		12		30		3
Medium	7	22	2	4	14	56	0	0
		18		3		45		0
Large	8	64	9	105	5	30	6	120
		51		85		24		97
Total	55	124**	18	124	41	124	8	124
		100		100		100		100

Table 7.1 Distribution of Blocks by Size

Numbers after decimal point are rounded; thus, total number does not always equal the sum of the column.

*"Small" refers to a block with the longest side less than 500 feet. "Medium" refers to a block with the longest side between 500 feet and 700 feet. "Large" represents a block with the longest side more than 700 feet (Designation based on Jacobs, 1961, pp. 179-186).

**124 acres is the approximate area of each study site (actual area is 124.1 acres).

However, the number of blocks can be misleading because a few large blocks can dominate the site and frustrate users' movement, yet this negative factor for permeability is not fully weighted in simple block counts. Therefore, the acreage of blocks may be a more accurate representation of each community's permeability. In this way, the proportion of total acreage of the corresponding

three block sizes can be calculated, and this proportion can demonstrate how much small, medium, and large blocks are occupying the 124-acre study area circled with a quarter-mile-long radius.

If we consider the number of acres as indicated in table 7.1, Kentlands is not the most permeable community any longer despite the existence of numerous small blocks. Instead, what we observe is the domination of large blocks, which we already know weaken permeability. In fact, large blocks occupy more than half of the study area in Kentlands (fifty-one percent). Laguna West and Four Colonies are even more striking in terms of the domination of large blocks since they occupy about eighty-five percent of the site for Laguna West and almost ninety-seven percent of the site for Four Colonies. In this sense, Elmwood has the most advantageous block distribution for a permeable community with the least area of large blocks, which is only twenty-four percent of the site.

The shape of blocks is also an important determinant of permeability. This is because the shape of a block is closely related to the length of a block perimeter, which is the actual distance the users are required to take when they move around the block. Figure 7.7 illustrates the differences of perimeter length by shape between two polygons that occupy the same amount of area. Although both polygons cover the same four area-units, the polygon (a) has eight perimeter-units while (b) has ten perimeter-units. A polygon with no interior angle greater than 180 degrees has a shorter perimeter than a polygon with an interior angle greater than 180 degrees. Therefore, the former kind of block shape is

more efficient than the latter to cover an area and, thus, potentially, to support greater permeability.

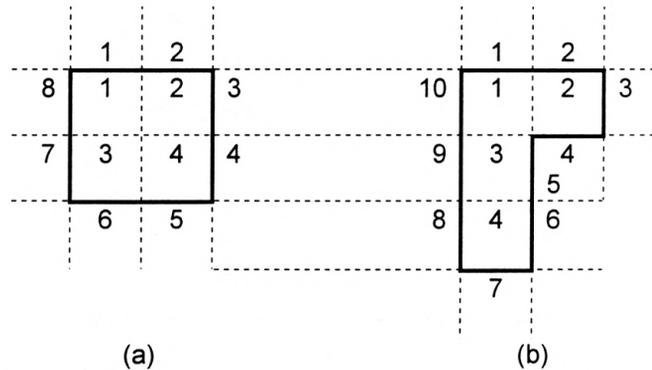


Figure 7.7 Difference of Perimeter Length by Shape

Both polygons cover four area-units, yet polygon (a) has eight perimeter-units while polygon (b) has ten perimeter-units.

Partly borrowing Bill Hillier's (1984) terminology for different types of urban spaces, I call such a block containing no angle greater than 180 degrees a "convex" block, and a block containing an angle greater than 180 degrees, a "non-convex" block. According to Hillier's definition, convex space does not contain any concave parts; thus, a straight line can join any two points in a convex space without going outside the boundaries of the space (Hillier, 1983, p. 50). In the same way, as illustrated in figure 7.8, in a convex block, straight lines can be drawn from any point in the block to any other point in the block without going outside the boundary of the block itself.

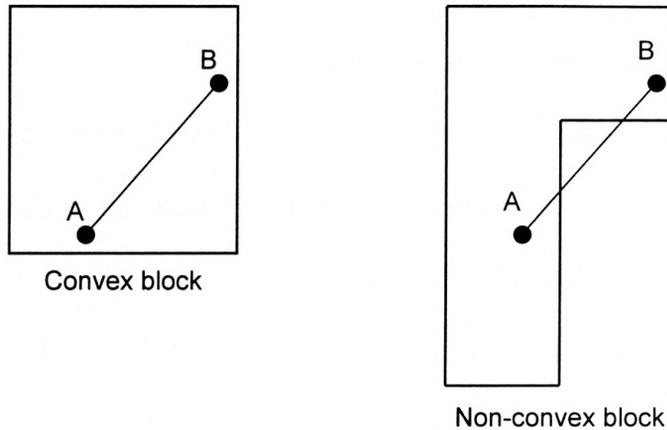


Figure 7.8 Convex block and Non-convex block

Convex block: no line drawn between any two points in the block goes outside the block.
 Non-convex block: a line drawn from A to B goes outside the block.

Since convexity of blocks relates to permeability, we need to compare and contrast how convex and non-convex blocks are distributed in the four study areas. Table 7.2 shows how many blocks are convex and non-convex, and also the relative acreage of each block type.

	Kentlands		Laguna West		Elmwood		Four Colonies	
	Number of blocks	Number of acres						
		Percent of total						
Convex	36	49	13	56	36	97	2	4
		40		45		78		3
Non-convex	19	75	5	69	5	27	6	120
		60		55		22		97
Total	55	124*	18	124	41	124	8	124
		100		100		100		100

Table 7.2 Distribution of Convex blocks and Non-convex blocks

Numbers after decimal point are rounded; thus, total number may not equal to the sum of the column.

*124 acres is the approximate area of each study site (actual area is 124.1 acres).

As illustrated in figure 7.6, blocks in Kentlands vary in shape ranging from a simple rectangle to a complex polygon with some recurrences of similar shape. When we look at the number of blocks, 36 out of 55 are convex blocks, which potentially support greater permeability, and 19 of them are non-convex block, which potentially weakens permeability. Kentlands, therefore, appears to have more positive traits in terms of shape. Laguna West's blocks are more or less formal in shape – for example, rough triangles, squares, rectangles, and other simple polygons. Similar to Kentlands' count, convex blocks outnumber non-convex blocks in Laguna West, 13 to 5 respectively; thus, this site too appears to be favorable for permeability in terms of block shape.

In Elmwood, many recurrences of similar convex blocks (mostly rectangular in shape) dominate the site. Although Elmwood has the same number of convex blocks as Kentlands – 36 –, there are many fewer non-convex blocks – only 5. Thus, Elmwood has many fewer non-convex blocks than Kentlands. In this sense, Elmwood is more permeable than Kentlands. On the other hand, Four Colonies is dominated by non-convex blocks with many curves and no recurrence of shape. While the site has a relatively small number of non-convex blocks – 6 –, Four Colonies suffers from a lack of convex blocks – only 2.

These differences in numbers of convex and non-convex blocks are even more accentuated when we look at the acreage of each block shape. In fact, non-convex blocks dominate three of the study areas in terms of acreage. Despite the fact that Kentlands has a large number of convex blocks, non-convex blocks still occupy sixty percent of the area. Similarly, Laguna West has fifty-five

percent of the area covered by non-convex blocks, while Four Colonies has almost its entire acreage – ninety-seven percent – in non-convex blocks. Only in Elmwood, do convex blocks exceed non-convex blocks – seventy-eight percent of the area in convex blocks versus only twenty-two percent of the area in non-convex blocks. In this sense, Elmwood has the most permeable blocks in terms of shape, and Four Colonies has the least permeable blocks. Kentlands and Laguna West are in between Elmwood and Four Colonies, but, overall, their block shapes do not contribute to permeability.

On the basis of number, size, and shape of blocks, therefore, I rank Elmwood's permeability as high, Kentlands' as medium, and Laguna West's and Four Colonies' as low.

Permeability and the Four Communities

Table 7.3 shows the rankings for the six themes discussed above. Scoring high on all six themes as the table indicates, Elmwood demonstrates the greatest permeability among the four communities. Elmwood's convenient pathway system provides users alternative travel modes besides the automobile, specifically walking and biking. The multi-directional street pattern of Elmwood accompanied by evenly distributed access points, allows users to move in all directions with ease. The strong interconnectivity is also manifested in Elmwood's evenly distributed and regularly arranged intersections and streets that create no sectional divisions in the site. Moreover, helped by the grid street pattern, small blocks in simple shape dominate Elmwood's layout.

	Kentlands	Laguna West	Elmwood	Four Colonies
Pathway system	Medium	Medium	High	Low
Street patterns	Medium	Medium	High	Low
Access points	Medium	Low	High	Medium
Intersections	Medium	Medium	High	Low
Aggregate street length	Medium	Low	High	Low
Number, size, and shape of blocks	Medium	Low	High	Low
Total	6 mediums	3 mediums 3 lows	6 highs	1 mediums 5 lows

Table 7.3 Rankings for Permeability

In contrast to Elmwood's high permeability, Kentlands demonstrates a lesser degree of permeability, scoring six mediums. Although Kentlands' interconnection of streets is quite high, the existence of some cul-de-sacs and loops (along with inconvenient location of retail use – an issue discussed in the next chapter on variety) limits users' transportation to the automobile only. Kentlands' street pattern and unevenly distributed access points also limit users' movement in certain directions, especially northeast and southwest. Uneven distribution of intersections with a weak sense of regularity is exhibited in the site's partial interconnectedness, creating several sectional divisions. Also domination of large blocks in complex shapes, contributes to Kentlands' permeability being considerably less than Elmwood's.

In table 7.3, Laguna West is scored with three mediums and three lows, which places the community behind Kentlands in terms of permeability. Although Laguna West's pathway system has a good number of connections, distances to

retail (discussed more fully in the next chapter) discourage the use of walking and biking modes. Laguna West's street pattern also limits users' movements in eastern and western directions. Unevenly distributed access points with many gaps separate the site from its surroundings, while far fewer intersections and the shortest aggregate street length weaken interconnectedness within the site. Further, the small number of blocks and the domination of large blocks significantly reduce Laguna West's permeability.

As table 7.3 indicates, Four Colonies is the least permeable community, scoring only one medium and five lows. Segregated pedestrian pathways, numerous cul-de-sacs and loops, and inconvenient retail location (discussed fully in the next chapter) demonstrate Four Colonies' auto-oriented pathway system. Short curved street patterns generate circuitous traffic movement and leads users in unexpected directions. Unevenly distributed intersections demonstrate weak interconnectedness, which is also exhibited in each cul-de-sac and loop's spatial autonomy and isolation. Moreover, fewer blocks in large size and complex shape form lengthy block perimeters and stifle Four Colonies' permeability.

Overall, a traditional streetcar community, Elmwood, exhibits the greatest permeability with many positive characteristics, while Four Colonies, a conventional suburban development, is the least permeable community with many negative characteristics. Part of Elmwood's sense of place may be explained by the community's strong permeability, while Four Colonies' weak permeability in all levels may explain the sense of isolation within the site and

separation from outside. Two New Urbanist communities, Kentlands (Traditional Neighborhood Design) and Laguna West (Transit Oriented Development) are definitely more permeable than a conventional suburban model like Four Colonies. Nevertheless, these New Urbanist communities are still less successful in terms of permeability than a true traditional community like Elmwood.

Although Kentlands possesses many positive traits that contribute to permeability, the community also has kept some negative features of modern suburbs, including cul-de-sacs and loops; hence, Kentlands' positive aspects may be offset by its negatives. Likewise, in terms of permeability, Laguna West does not depart enough from the conventional low-density suburban model. Laguna West has considerably reduced the conventional suburban model's negative characteristics such as cul-de-sacs and loops, but positive aspects of permeability are still minimal.

The next chapter uses the second responsive environment quality – *variety* – to evaluate the four study sites in terms of their specific land uses and functions and their spatial distribution.

CHAPTER 8

VARIETY AND THE FOUR COMMUNITIES

As explained in chapter 6, variety is the quality of an urban district that contains different functional uses resulting in different building types and therefore attracting different users at different times of day and night. If all the places were the same in a district, it would not become a viable place because users could experience only one thing. Thus, unless a district offers a wide range of accessible places involving a choice of potential experiences, permeability is irrelevant.

Since variety relates to the range of experiences that a place offers, providing the widest number of uses is the key to increase variety. A wide range of uses, in turn, implies varied building types and forms, and the attraction of varied people, which creates varied meanings at varied times for varied reasons. The result is a rich perceptual and experiential mix. Therefore, a community's land use pattern is closely related to the fundamental level of variety and is also the largest-scale indicator of function and activities.

According to Jacobs (1961), to generate diversity, a district must serve more than one *primary function* – a use that attracts people in its own right such as dwellings, workplaces, large stores or markets. A primary function can help ensure the presence of people who go outdoors on different schedules and are in a place for different purposes (ibid., p. 152). A mixture of primary uses expands

activity time and helps *secondary uses*, like restaurants and shops, for example, which lack the pulling-power alone to attract people. In other words, these secondary uses live off the people drawn to the place by its primary uses.

There should be mutual support between people who are drawn by primary and secondary uses. Although secondary uses are dependent on people going to and from a district throughout the day and night, without these smaller establishments, diversity cannot be achieved. Jacobs (1961), therefore, criticizes conventional single land use zoning that disables such mutual support between primary and secondary uses and fails street diversity by limiting land use to one function and one purpose.

In this chapter, I examine the degree of variety for the four study sites. To measure variety as an evaluation criterion, I focus on land use and primary and secondary uses. As I did in the previous chapter on permeability, I provide a series of analyses, each of which concludes with a ranking of each community's variety in terms of "high," "medium," or "low." These analyses draw on a consideration of a series of map readings that include the interpretation of land use and primary and secondary uses to identify the relative degree of variety for each study site.

1. Land use

As the largest-scale indicator of function and activities, land-use pattern determines each community's fundamental level of variety. Following the designation of planner Michael Southworth (1995), one can categorize each

community's land use patterns into seven different uses: (1) single-family detached, (2) single-family attached, (3) multi-family, (4) retail/commercial, (5) light industrial, (6) civic/institutional, and (7) multi-use (a mixture of residential, commercial, or industrial).

“Single-family detached” refers to single-family residential uses or owner-occupied dwellings that stand on their own and are not joined to other buildings. This land use represents typical low-density suburban residential subdivisions. “Single-family attached” can also refer to some types of owner-occupied one-family residential use; however, this type of single-family housing is an attached dwelling sharing a wall with another building, and thus not standing alone. Duplex units are the most common type of this kind; nevertheless, triplex, four-plex, five-plex, and six-plex are also included. “Multi-family” also refers to residential use, but it houses several families sharing common entrances and hallways. Apartment buildings are typical of this type, which also includes rooming houses and hotels.

In turn, “retail/commercial” relates to commerce involving the buying and selling of goods or services, ranging from a small business to a large retail park. At the smallest scale, this land use involves the selling of goods in small amounts directly to customers such as in smaller stores, which generally stand alone or are in small commercial centers. Examples would include convenience stores, beauty salons, restaurants, grocery stores, drug stores, clothing stores and specialty shops. In addition, this land use can include office and service uses, for

example, doctor and dental offices, professional offices, and large-scale office buildings with single or multiple tenants.

At a larger scale, “retail/commercial” provides services to a larger area as well as automotive traffic generated from a major highway that may include uses such as restaurants, motels, automotive service uses, building-supply uses, large retail and other related uses. At the largest scale, this land use can incorporate a regional commercial retail in concentration that serves a larger regional market and may include uses such as large grocery superstores and discount stores, warehouse clubs, large specialty retailers, manufacturers outlet stores, and department stores. Such uses are usually located in large commercial centers along major highways. Further, “retail/commercial” includes business parks that are predominately office or research type facilities with lower intensity or smaller-scale manufacturing, warehousing and wholesaling.

“Light industrial” is also a nonresidential use and involves the manufacture of comparatively small products, especially consumer goods made without the use of heavy machinery. This land use also includes space for offices, warehousing, assembly, manufacturing and buildings with a mixture of these uses. An example would be a high-end mixed use corporate "campus" with multiple functions on one site.

“Civic/institutional” uses are closely related to governmental functions of a town or city. Because this land use typically is connected with public administration, it is often categorized as public or semi-public and involves educational, health care, and recreational purposes. Most buildings are open for

public use and include schools, religious centers, community centers, golf courses, country clubs, cemeteries, hospitals, public or civic buildings, museums and other similar uses.

“Multi-use,” on the other hand, refers to more than one land use for several different purposes. Possibilities include a mix of residential and commercial land uses such as retail/commercial on ground level and residential use above, or a mix of residential and industrial uses such as low-intensity residential use and limited industrial uses.

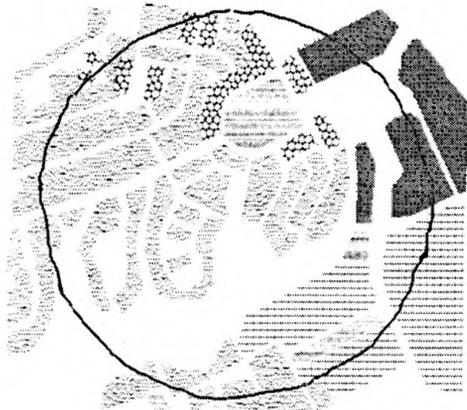
Table 8.1 identifies the types of land use in each of the four study areas. In a simple count, Laguna West has the widest range of land uses, with seven, while Kentlands and Elmwood have five uses each, and Four Colonies has the least, with four different land uses. However, these simple counts do not consider the scale or spatial distribution of the various functions. Thus, the spatial distribution of land use also needs to be taken into account.

	Kentlands	Laguna West	Elmwood	Four Colonies
(1) Single-family detached	Yes	Yes	Yes	Yes
(2) Single-family attached	Yes	Yes	No	Yes
(3) Multi-family	Yes	Yes	Yes	No
(4) Retail/commercial	Yes	Yes	Yes	Yes
(5) Light industrial	No	Yes	No	No
(6) Civic/institutional	Yes	Yes	Yes	Yes
(7) Multi-use	No	Yes	Yes	No
Number of land uses	5	7	5	4

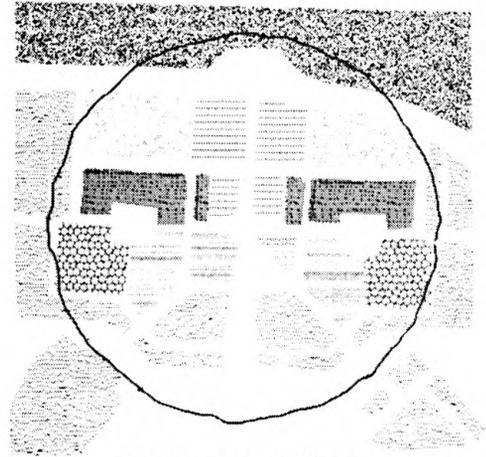
Table 8.1 Land Use for the Four Study Sites

The maps in figure 8.1 illustrate the spatial distribution of each study area's land use patterns. As illustrated in map A, Kentlands incorporates five land uses: single-family detached, single-family attached, multi-family, retail/commercial, and civic/institutional. The mixture of land uses is accomplished quite well as a whole in Kentlands. By maintaining a considerable amount of natural environment, which includes several lakes and natural woods in its varied topography, Kentlands offers a unique environmental experience for its residents. However, each land use tends to be clustered in one place, a pattern which reduces the ease of access to different uses. For example, the multi-family residential area is largely located in a northeastern sector, and the commercial area is marked by a large shopping center in the southeastern sector. Such single large land uses tend to minimize the potential richness of place experience, thus, undermining variety. In this sense, Kentlands' land use pattern echoes the standard zoning characteristic of separating functions, activities, and land uses.

As illustrated in map B, Laguna West incorporates seven land uses: single-family detached, single-family attached, multi-family, retail/commercial, light industrial, civic/institutional, and multi-use. The distribution of each land use is formalized in the sense that each land use is mostly identified and separated by blocks. Similar to Kentlands, a considerable water body offers a unique experience to users, although the lakes in Laguna West are manmade and lack the feeling of a fully natural environment. However, Laguna West's strict adherence to functions tied to blocks works against variety because of large

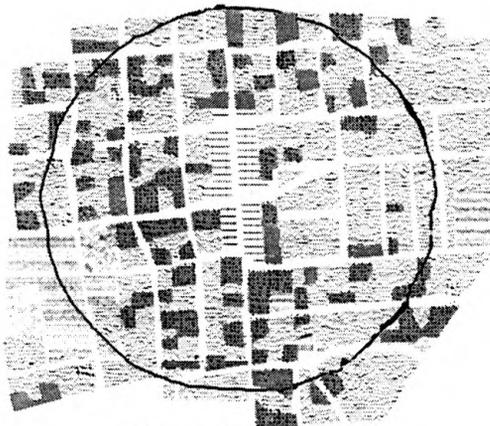


Map A. Kentlands

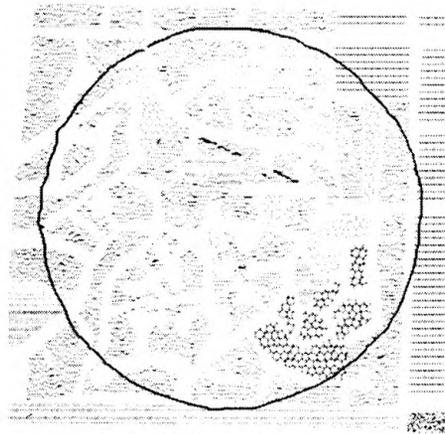


Map B. Laguna West

N



Map C. Elmwood



Map D. Four Colonies

-  Single family detached
-  Single family attached
-  Multi family
-  Multi use
-  Retail/commercial
-  Light industrial
-  Civic/institutional

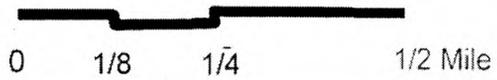


Figure 8.1 Land Use for the Four Study Sites

block size; each land use appears to be too large to create a good mixture of experience for users. In other words, a block can provide only a single experience in Laguna West. Therefore, Laguna West also resembles a typical specialized-zoning suburban pattern just like Kentlands.

In contrast, as illustrated in map C, Elmwood has a varied, smaller-grained mixture of land use. Its land uses are five kinds: single-family detached, multi-family, retail/commercial, civic/institutional, and multi-use. Although the number of land uses is less than Laguna West's seven, a strong sense of variety is potentially available in Elmwood due to the small-scaled variation of its land use patterns. Moreover, a mixture of many apartments in single-family detached dwellings suggests an abundance of mingling of people of different social economic and demographic status. Further, unlike Laguna West, most land uses are not subject to blocks; they occupy portions of the neighborhood's relatively small blocks. In Elmwood, zoning by function appears to be nonexistent, yet this much more complex mixture may be the most effective in creating a high degree of variety.

On the other hand, as illustrated in map D, Four Colonies expresses its strong conventionality of specialized zoning; similar land uses are clustered in larger-scale sectors that have a sense of clear specialization. There are four kinds of land uses in Four Colonies: single-family detached, single-family attached, retail/commercial, and civic/institutional. Although some degrees of mixture of single-family detached and single-family attached exist, their differences are minimal due to the fact that most single-family attached structures

are condominiums in Four Colonies. This tendency of large-scale specialized land use is even more apparent when we look at the immediate surroundings of the study site. A shopping center is part of a large planned commercial/business park across from Four Colonies on its eastern edge. Single-family residential units extend north and west; a large cemetery occupies the southern sector, while large manufacturing and industry occupy sectors in the southwest. Similar to Laguna West, each land use is too large-scale to offer users a sense of easily-accessible variety. The extent of separation in Four Colonies is much more intense than in Laguna West due to the much larger parcels devoted to single land use. Four Colonies, undoubtedly, is a product of conventional suburban zoning.

Based on the preceding analysis, I rank Elmwood as high in terms of variety of land use, Kentlands and Laguna West as medium, and Four Colonies as low.

2. Primary and secondary uses

Primary and secondary uses are two kinds of building functions relating to the degree of pulling power that an activity or function has to attract people to a district. The idea of primary and secondary uses is from Jane Jacobs' (1961) condition for generating diversity and is here used to analyze the degree of variety in each of my four study sites.

According to Jacobs, a primary use is a function that attracts people in its own right. In other words, it is an anchor or magnet – people must go to it. A

dwelling and workplace concentration, therefore, are primary uses. Large stores or markets are also included as primary uses because they can have a similar effect. Jacobs argues that to generate diversity, mixed primary uses are necessary; more specifically, the district must serve more than one primary function, preferably more than two, because primary functions insure the presence of people who go outdoors on different schedules and are in a place for different purposes (ibid., p. 152).

In contrast, a secondary use is a function that lacks the pulling power to attract people. Rather, secondary uses live off the people drawn to a place by primary uses. Small business enterprises like shops and restaurants are considered to be secondary uses. These supportive uses are dependent on residents and users going to and from the district throughout the day.

Primary and secondary uses work together in order to create variety in the district. Primary uses support secondary uses by creating pedestrian flow and potential users for secondary uses, while secondary uses support district variety. A mixture of primary uses such as workplaces and homes contribute potential users on different schedules and help secondary uses such as restaurants and taverns by providing customers who appear at different times throughout the day and night.

In the analysis of my four study sites, the residential uses, workplace concentrations, and large stores or markets are considered to be primary uses, while smaller retail/commercial and recreational uses are considered to be secondary uses. I analyze number, kind, and location of each use in terms of

potential movement of pedestrians who might contribute to variety. This is because Jacobs' premise of primary and secondary use as a condition of generating variety is largely based on "foot people" or pedestrians in a city.

Maps in figure 8.2 illustrate each study area's primary and secondary uses and potential pedestrian flow. As illustrated in map A, Kentlands has three kinds of primary uses: residents, a shopping mall, and work places. Potential flows of people among these three functions may be fairly high. Work places are part of a mixed-use area that includes offices, retail, and some residential above; in this sense, this area has achieved a high level of variety. Beyond the site of Kentlands, there is a large work place within a mile to the northeast – the National Institute of Standards and Technology, which hosts several thousands employees. However, a major highway separates Kentlands and the institute campus, which limits the connections to automobiles. Also, there are no secondary uses between the residents and work place, thus, the contribution to variety may be minimal. In general, the lack of work places in close proximity in Kentlands may restrict people's movements to a limited time of the day. Moreover, the location of secondary uses such as a recreation center and museum could be more effective if they were located between the different primary uses that generate traffic.

As illustrated in map B, Laguna West has two primary uses: residents and work places. Similar to the mixed-use area in Kentlands, Laguna West's two mixed-use areas have achieved a high level of variety, which are indicated as

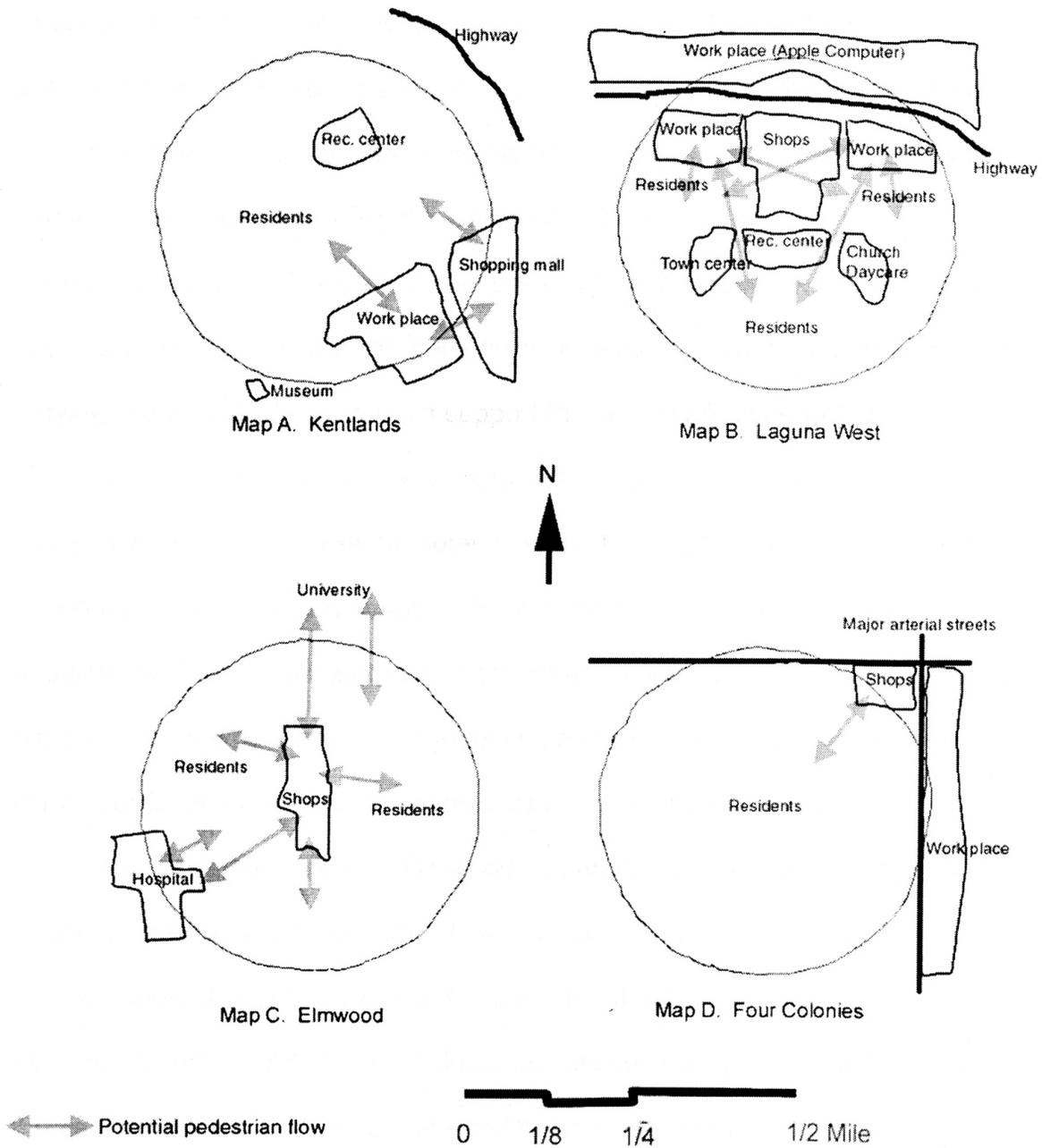


Figure 8.2 Primary and Secondary Uses
 Arrows indicate potential user flows between different primary uses.

“work place” and contain offices, retail, and some residential above. Primary and secondary uses are conveniently placed side by side for both workers’ and residents’ needs; Laguna West’s neighborhood shops, town center, recreation center, church, and daycare (all considered to be secondary uses) are surrounded by three different primary uses: light industrial work places, offices, and residents. This layout can potentially generate a good amount of traffic flow between work and living, and can support the secondary uses well, which contributes to variety. However, a major drawback may be that residents and users must use automobiles to move between the largest work place – an Apple Computer plant that hosts about 1,000 employees – and shops or houses. In addition, this plant is separated from the other uses by a divided highway. This fact may restrain people’s movements and hamper achieving a high level of variety by limiting the mutual support between primary and secondary uses.

As illustrated in map C, Elmwood’s primary uses are three kinds: residents, shops, and a hospital. Unlike shops in Laguna West, the concentration of shops in Elmwood is considered to be a primary use because there are so many. Although individual businesses may be secondary uses by themselves, as a concentration of small businesses, it is a well-established market with a wide variety of shops, restaurants, and other businesses that attracts people from and beyond its neighborhood. Unlike Kentlands and Laguna West, Elmwood has only one major work place in the study area: a hospital in the southwest sector, nonetheless, the district has a very large primary use about a half mile north – the University of California, Berkeley campus that hosts more

than 37,000 students and employees. This is a major advantage over Kentlands and Laguna West because the university population is much larger than the work place populations in Kentlands and Laguna West, and university students and faculties are, in general, more flexible in their work hours, and thus, may support shops by visits throughout the day and night. Furthermore, in contrast to Kentlands' and Laguna West's highways that separate work places and other uses, there is no highway separating the university campus and shops or residents; people can walk and bike freely between uses. Elmwood's pedestrian-friendly streets may foster a high degree of variety in the shopping area by providing easy access to a variety of users. In this sense, pedestrian-friendly streets may be necessary for a concentration of secondary uses – small businesses – to become a primary use – an attractive marketplace.

As illustrated in map D, Four Colonies' primary use are two kinds: housing and work places. These work places are part of a large suburban business park, which hosts several thousand employees. Similar to Kentlands and Laguna West, a major arterial street separates the business park and residents or shops; therefore, transportation is limited to automobiles. This restriction is also observed in the shopping center, the location of which may be appropriate between two different primary uses because the potential of traffic flow between work and living is usually high; however, facing a intersection of two the major arterial streets, Four Colonies' shopping center may be destined to become a strip mall for auto users. Although it is designed to accommodate pedestrian users in the residential area by providing several rear walkway connections, the

shopping center works more so as a barrier between inside and outside Four Colonies. While visitors have to use automobiles to get to the shopping center, automobiles are not allowed to go into the community because there is no direct connection between the shopping center and the residential area. Users from the community, on the other hand, are encouraged to walk to the shopping center, yet they are unable to move beyond without an automobile. The shopping center may be designed to become a primary use with a strong pulling power to attract people, but, ironically, the very design works against becoming a market place by limiting transportation means.

Based on the preceding analysis in terms of primary and secondary uses' potential contribution to variety, I rank Elmwood as high, Kentlands and Laguna West as medium, and Four Colonies as low.

Variety and the Four Communities

Table 8.2 shows the summary rankings for the two themes discussed above. As the table indicates, Elmwood ranks high on two themes and demonstrates the greatest variety among the four communities. Elmwood's varied and smaller-grained mixture of land use generates a mingling of people of different social economic and demographic status. The community's substantial shopping district makes a primary use and attracts people beyond its neighborhood including another large primary use – a university campus – which, in turn, generates users throughout the day and night. Elmwood's pedestrian-friendly streets provide easy access to a variety of users. Therefore,

Elmwood incorporates all aspects of variety including varied functions, varied users, and varied uses throughout the day and night.

	Kentlands	Laguna West	Elmwood	Four Colonies
Land use	Medium	Medium	High	Low
Primary and secondary use	Medium	Medium	High	Low
Total	2 mediums	2 mediums	2 highs	2 lows

Table 8.2 Rankings of the Four Study Sites for Variety

In contrast to Elmwood’s high degree of variety, Kentlands is ranked in table 8.2 as medium in regard to land use and primary and secondary uses. Kentlands offers a unique environmental experience with a considerable amount of natural environment in its varied topography. Kentlands’ mixed-use areas also offer a high level of variety. However, Kentlands’ land use pattern – i.e., clustering large-scale land uses in one place only – reduces the ease of access to different functions and minimizes the variety of place experience. The lack of work places in close proximity in Kentlands also restricts people’s movements to a limited time of the day. Moreover, a major highway separates Kentlands and the large work site outside the community by limiting the connections to automobiles only. Inconvenient location of retail uses also limits users’ transportation to the automobile. Further, ineffective locations of secondary uses that are not located between the different primary uses undermine Kentlands’ variety.

As table 8.2 indicates, Laguna West is also ranked with two mediums, which places the community at the same level as Kentlands in terms of variety. Laguna West incorporates seven land uses, which is the most among the four study sites, and a large water body offers a unique experience to users. Laguna West's mixed-use areas also have a high level of functional variety. However, Laguna West's strict adherence to functions tied to blocks works against variety because of block size, which is too large to create a good mixture of user experiences. Laguna West's primary and secondary uses are placed side by side for both workers' and residents' needs, but both residents and users must drive to move between the largest work place – a computer plant – and shops or houses.

As table 8.2 indicates, Four Colonies has the least degree of variety, ranking low on both themes. Four Colonies has four kinds of land uses, the least among the four study sites. Four Colonies' conventionally specialized zoning model clusters similar land uses in larger-scale sectors than Kentlands'. Each land use is of too large scale to offer users an easily accessible variety like Laguna West, yet the extent of separation in Four Colonies is much more intense than in Laguna West because of the much larger parcels allocated to single land uses. Four Colonies' two primary uses – work places and residences – are separated by a major arterial street, and transportation is limited to automobiles. Inconvenient retail locations also demonstrate Four Colonies' auto-oriented pathway system. Limiting transportation to only automobiles, Four Colonies diminishes the potential of traffic flow between work and living, resulting in a

minimally supported secondary use – a small shopping center – located between these two different primary uses.

Overall, as a traditional community, Elmwood exhibits the greatest variety among the four study sites, encompassing varied functions, varied users, and varied activities throughout the day and night. Elmwood's smaller-grained mixture of land use mingles many different types of people, and easy street accessibility invites varied transportation modes and users. Also, the variety of primary uses creates varied activities day and night. Elmwood's high degree of variety is synergistically created by a strong interdependence among the districts' many diverse environmental and human components. In contrast, a conventional suburban development Four Colonies as an auto-oriented environment demonstrates the least level of variety with such conventional suburban characteristics as specialized zoning and auto-oriented pathways, none of which supports variety.

The two New Urbanist communities of Kentlands and Laguna West have more variety than a conventional suburban development like Four Colonies, but these New Urbanist communities are much less successful in terms of variety than a traditional community like Elmwood, largely established before the dominance of the automobile. These New Urbanist communities simply lack a sufficient number of elements to support variety, and the number of uses that are available are isolated and, thus, unavailable to offer mutual support through proximity. Moreover, such conventional suburban characteristics as specialized land uses, distant work places, and collector streets work synergistically against

environmental variety by creating auto-oriented environments. The negative outcome overwhelms such few positives as attractive lakeshores or mixed land use areas that support variety.

CHAPTER 9

LEGIBILITY AND THE FOUR COMMUNITIES

As explained in chapter 6, the third quality that helps create responsive environments is legibility, a designable feature that makes a place mentally graspable and visually coherent as a physical environment and thus imageable and coherent cognitively. The authors of *Responsive Environments* argue that residents and users need to recognize a district's layout and what is going on in that district because otherwise people cannot take advantage of the choices that qualities of permeability and variety offer. In other words, a place needs to be legible in order to appreciate its permeability and variety.

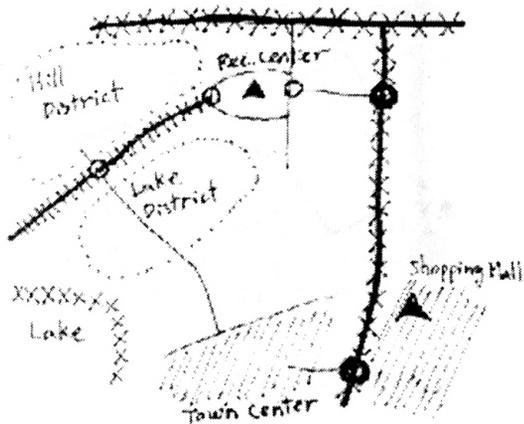
To examine environmental images systematically, Kevin Lynch (1960) explored their contents. He found that there are shared aspects of environmental images and that certain sorts of physical features play a key role in the content of these shared images. Lynch classified these features into five types of elements that refer to physical form: (1) paths, (2) nodes, (3) landmarks, (4) edges, and (5) districts. These elements closely relate to visual quality of the apparent clarity of the cityscape, and legibility is largely dependent on these five elements. Using Lynch's work, the authors of *Responsive Environments* draw upon these elements in the urban design process to create potentially legible environments which support responsiveness.

In this chapter, I examine the degree of legibility for my four communities. I use Lynch's (1960) five elements as evaluation criteria for legibility; I identify the

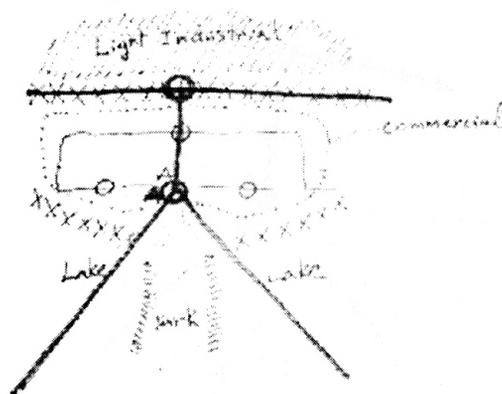
arrangement and number of paths, nodes, landmarks, edges and districts by looking at any existing forms that may be used to make the place more legible within the site and any nearby areas that can be seen from the site. As I did in previous chapters on permeability and variety, I do a series of analyses, each of which concludes with a ranking of each community's legibility in terms of "high," "medium," or "low." These analyses draw on a series of map readings that include the interpretation of physical elements to identify the relative degree of legibility for each community.

Ideally, I should interview and collect actual users' mental maps; however, because the circumstance did not allow for such data collection (especially the costs of traveling to each site), I have used my own understanding as an expert; thus the maps in figure 9.1 are my specialist's definition of each study site's image. These maps include major and minor elements according to the strength of legible elements in each community as judged by my personal evaluation.

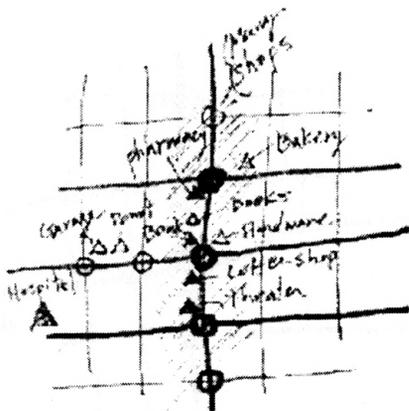
It is also important to point out that the structure or spatial arrangement of the elements in these mental maps is distorted, and each map encompasses a larger area than my 1/4-mile radius study area. In order to compare and contrast each community more precisely, adjustment is necessary; therefore since these elements are perceived rather than real, I have plotted identified elements in figure 9.1 onto my 1/4-mile study-site maps even when these elements would not be present geographically (but would probably be present in users' mental maps). In looking at these image maps, one immediately notes that Laguna West and Elmwood appear to be more legible and contain many elements, while



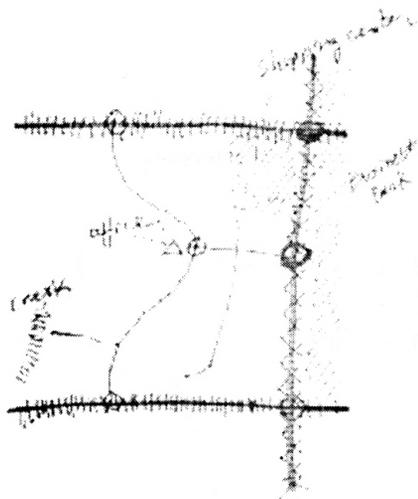
Map A. Kertlands



Map B. Laguna West



Map C. Elmwood



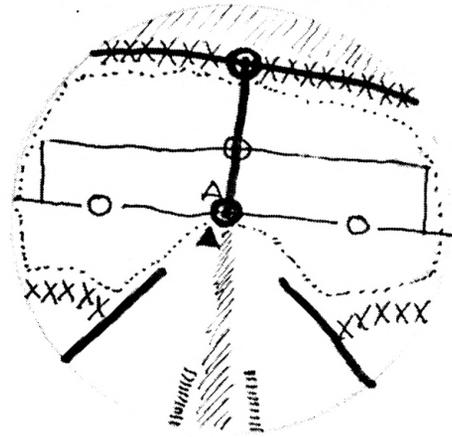
Map D. Four Colonies

	Path	Node	Landmark	Edge	District
Major element	—	●	▲	XXXXXX	▨
Minor element	- -	○	△	xxxxxx	▤

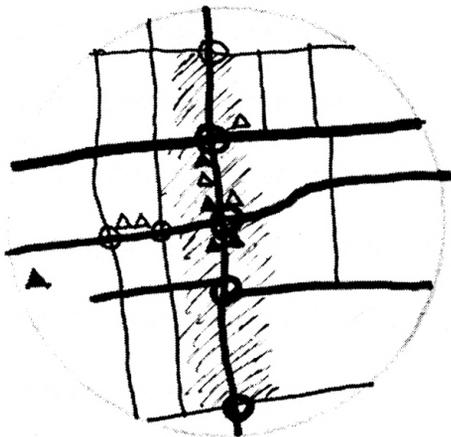
Figure 9.1 The Author's "Expert" Mental Maps of the Four Study Sites



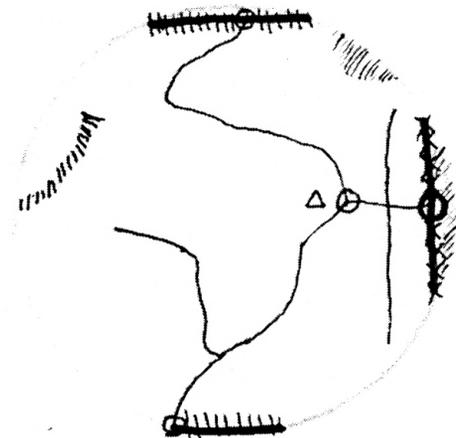
Map A. Kentlands



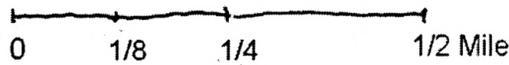
Map B. Launa West



Map C. Elmwood



Map D. Four Colonies



	Path	Node	Landmark	Edge	District
Major element					
Minor element					

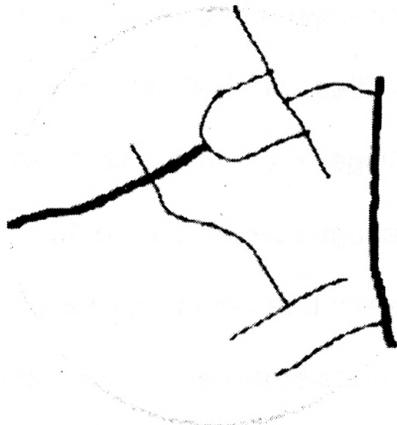
Figure 9.2 Adjusted Mental Maps for the Four Study Sites

Four Colonies appears the least imageable and Kentlands is somewhere in between. However, because each of Lynch's five elements plays different roles in a place's legibility, more precise analysis is necessary, which is provided in the following sections.

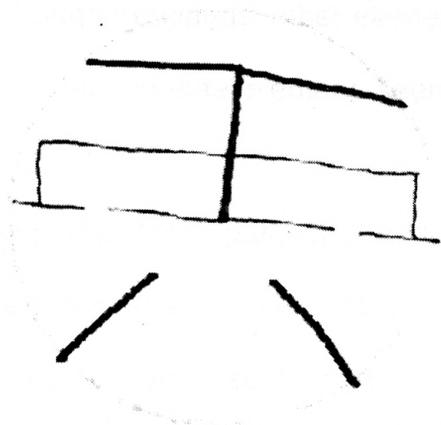
1. Paths

According to Lynch (1960), paths are the channels of movement in a place. They may be streets, alleys, walkways, railroads, transit lines, and canals. People observe the city while moving through paths, and other elements of the place are arranged and related in users' minds along paths. Because Lynch found that paths are predominant elements in many people's mental images, he concluded that paths are the most important element for legibility (Lynch, p. 96).

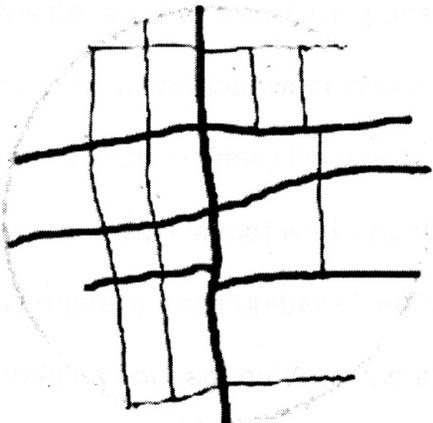
Map A in figure 9.3, illustrates Kentlands' legible paths as I have imaged them in my own expert cognitive map of the study site. These paths are major arteries that have four lanes with plantings in the middle and some two-lane streets that have immediate links to these arteries. These major paths also relate to the boundaries of districts, while minor paths connect these districts. These minor paths also help create memorable nodes by intersecting major paths. These paths are most used and probably most remembered by users. Nonetheless, because of the tilted street direction and warped grid shape, Kentlands' paths are probably more or less confusing. Despite Kentlands' large number of streets, directional ambiguity undermines users' imagibility of paths. The number of loops and cul-de-sacs also works against legible paths by



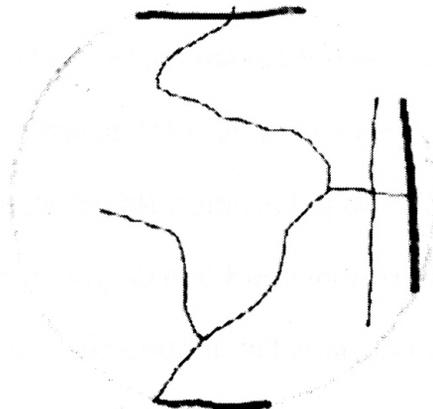
Map A. Kentlands



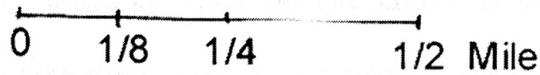
Map B. Laguna West



Map C. Elmwood



Map D. Four Colonies



— Major path
— Major path

Figure 9.3 Probable Paths for the Four Study Sites

creating isolated and broken connections. Although Kentlands' other elements likely have high legibility, path, which is the most fundamental element, seems to be overlooked in terms of legibility.

Map B illustrates Laguna West's legible paths. Major paths are likely a four-lane major artery and three radiating streets from the centrally located roundabout. These streets are more used than others because they are connected to the main entrance to the community and lead to different areas within the community. Minor paths intersect with these major paths or hinge on landmarks. These paths are likely more easily remembered than Kentlands' paths because of their strong directional clarity. Most streets are laid out either in a north-south or east-west direction symmetrically, which makes the whole pathway system easily knowable for users. A typical New Urbanist design of formal pathway layout works positively to create legible paths in Laguna West. Nevertheless, the number of legible paths is comparable to Kentlands' due to the coarseness of Laguna West's pathway system. Although directional clarity may be important for legibility, high street density also may need to be considered.

Map C illustrates Elmwood's most legible paths. Most paths are long straight streets, which make them easily graspable for users mentally. Major paths run around the shopping area; College Avenue runs in a north-south direction along the shopping area, and the other three paths dissect College Avenue in an east-west direction perpendicularly. These three paths are well used and probably easily remembered because of the existence of distinguishable shops on each corner. Minor paths are also remembered by the

existence of unique landmarks along them, but more importantly, the predictable grid street pattern makes these paths much more graspable than Kentlands' and Laguna West's. Streets in Elmwood are denser than Laguna West and are laid out in strictly north-south and east-west directions unlike Kentlands. In a sense, Elmwood has best part of Kentlands and Laguna West in terms of legible paths: large number of streets and clear streets direction. Helped by these positive factors, Elmwood has achieved the greatest number of legible paths. Since path is the most important element to become legible as a whole, Elmwood has greater potential than other three communities.

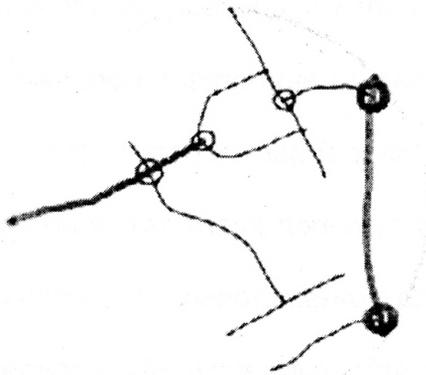
In contrast, as illustrated in map D, Four Colonies demonstrates poor legibility in terms of paths. Major paths in Four Colonies are major arteries, and minor paths are collector streets. Because major arteries surround Four Colonies, users have to move along them in order to enter or leave the community. Likewise, users are forced to use collector streets in a conventional suburban development like Four Colonies, and naturally, users' most remembered paths are the most used arteries and collector streets. Constantly meandering paths in Four Colonies are directionally confusing, and numerous loops and cul-de-sacs with directional ambiguity also create isolated spots that are difficult for users to picture in their minds. As a result, Four Colonies has the least legible paths despite the fact that there is a large number of streets. In this sense, directional clarity may be the most important aspect in order to create legible paths over street density, and Four Colonies fails miserably in this regard.

Based on the preceding analysis of paths, I rank Elmwood's legibility as high, Kentlands' and Laguna West's as medium, and Four Colonies' as low.

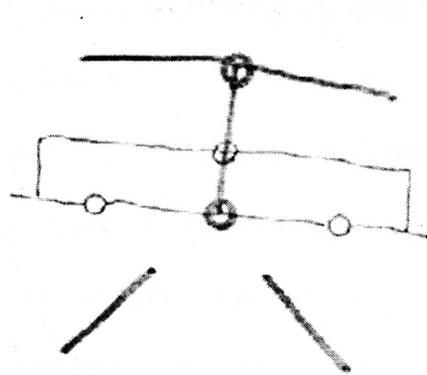
2. Nodes

According to Lynch (1960), nodes are major points of intersection for the user. They may be enclosed squares, places of a break or junction in transportation, a crossing or convergence of paths, or moments of shift from one structure to another. Nonetheless, the existence of nodes is largely dependent on legible paths.

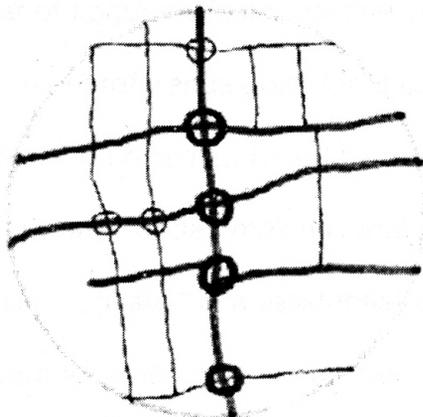
As illustrated in map A of figure 9.4, Kentlands can be said to have five legible nodes: two major nodes and three minor nodes. These nodes include two more traveled intersections and three medium-traveled intersections that are demarcated by changes of land use or district. These most active intersections are nodes through which most users have to go past in order to enter or leave the community and are likely to be well remembered by users. One node may probably be seen as an entrance to Kentlands' residential district, which is marked by the most active intersection in the community, while the other major node may be seen as an entrance to the Kentlands' town center, which is marked by a rotary. Three medium intersections signify changes in land uses; two of the medium intersections introduce users to Kentlands' recreation center rather theatrically by meeting with the recreation center perpendicularly, while another intersection connects two of the most topographically interesting districts: Hill District and Lake District. These intersections involve relatively heavy traffic



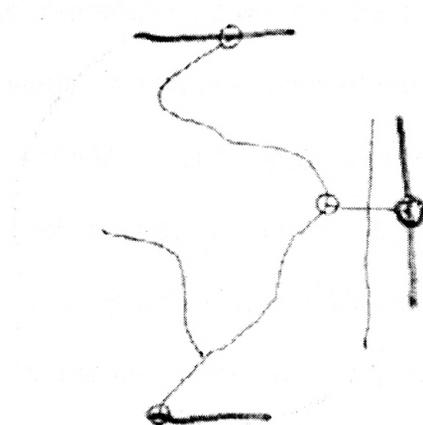
Map A. Kentlands
(2 major nodes, 3 minor nodes)



Map B. Laguna West
(2 major nodes, 3 minor nodes)



Map C. Elmwood
(4 major nodes, 3 minor nodes)



Map D. Four Colonies
(1 major node, 3 minor nodes)



0 1/8 1/4 1/2 Mile

 Major path  Major node
 Minor path  Minor node

Figure 9.4 Probable Nodes for the Four Study Sites

because of their locations, but the genius of design and interesting topography may make them memorable as well and strongly legible.

As illustrated in map B of figure 9.4, Laguna West can be said to have five legible nodes: two major nodes and three minor nodes. These include two major intersections, one minor intersection, and two small squares. One major intersection is literally a main entrance to the community, while another major intersection is the spatial center of Laguna West and marked by a rotary with fountain. As in Kentlands, these well-used intersections are such because users must pass them through for entrance and exit. The one minor intersection is the center of Laguna West's commercial area; the intersection is likely to be a convenient reference point for shoppers. Similarly, two small-enclosed squares are likely to be remembered by users in specific districts, and are good examples of deliberate "nodes making" and more than likely successful in their degree of legibility. Located in a residential area, these squares probably provide users a memorable amenity. Overall, because of the formal and symmetrical layout of streets and squares, Laguna West's nodes are probably easily imagined and located by users.

As illustrated in map C, Elmwood can be said to have seven nodes: four major nodes and three minor nodes. These nodes are all street intersections and surrounded by various land uses and unique buildings. Most major nodes represent the cores of Elmwood's shopping district and are likely remembered because of the existence of unique corner shops, while one major intersection represents the southern boundary of this shopping district. Minor nodes do not

have such unique corner shops but are located on a legible path with memorable buildings leading to a significant landmark – Alta Bates Hospital. These minor nodes are likely to be remembered by their connective function between residential and commercial districts. Since different elements meeting in juxtaposition tend to create memorable physical environments, Elmwood’s small-grained land use pattern has a great advantage in terms of creating legible nodes. Elmwood’s land use pattern is essentially a mixture of commercial and residential functions; however, even in each land use, there is a wide variety of shops and housing types plus a wide range of building styles. Although Elmwood lacks consciously-created public space, the community’s numerous legible paths and diverse land uses no doubt negate this shortcoming.

As illustrated in map D of figure 9.4, Four Colonies’ nodes are four: one major node and three minor nodes. This small number may be due to the area’s confusing pathway system and single-function land uses. One major node represents Four Colonies’ main entrance, and two minor nodes are community “back entrances.” The one last minor node is located where a collector street from the main entrance meets the community office. All of these nodes have stop signs for traffic safety, and in a community like Four Colonies, where a few collector streets dominate, users are likely to remember only places where an automobile has to stop. Where only auto transportation is assumed in a community, creating legible nodes may be difficult because automobiles’ speed and cocoon-like isolation reshape users’ environmental experiences. The

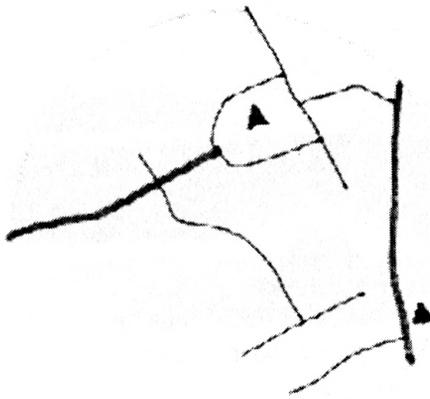
resulting image may be less fine-grained than if, like Elmwood, the community is pedestrian based.

On the basis of this analysis of nodes for the four sites, Elmwood's legibility can be ranked as high, Kentlands' and Laguna West's as medium, and Four Colonies' as low.

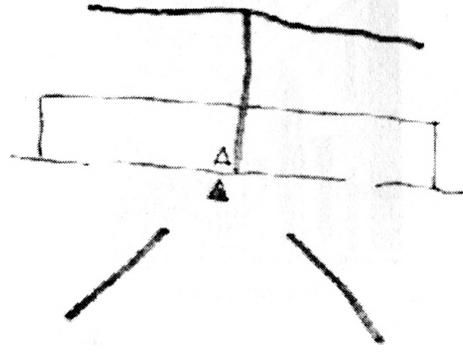
3. Landmarks

Landmarks are objects in the environment used for orientation. They are usually a rather simply defined physical structure such as a building, sign, store, or mountain. The existence of landmarks may be dependent on location, character, size, and other elements, especially paths.

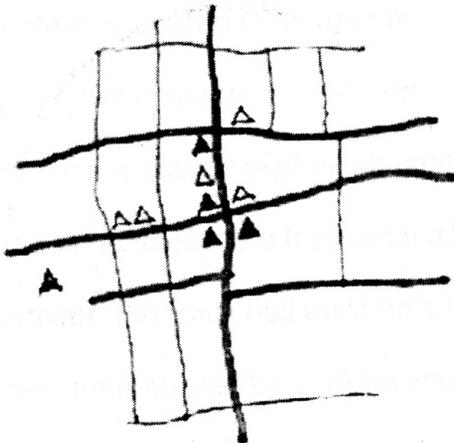
As shown in map A of figure 9.5 and figure 9.6, Kentlands has two major legible landmarks: a recreation center and a shopping mall. The existence of these landmarks is largely dependent on paths. Kentlands' recreation center is likely remembered due to not only its unique postmodern character but also its plaza-like location that feeds six streets from all directions at the end of four of these streets, the recreation center offers a highly visible termination point. Helped by the street pattern, the recreation center is probably highly perceptible for any user including pedestrians and bikers. In contrast, the postmodern shopping mall's visibility is likely assured by auto users only. Large mall buildings are placed right next to the busiest artery that allows mostly for auto use only. The building is large, and drivers can perceive the building easily and probably remember it.



Map A. Kentlands
(2 major landmarks)



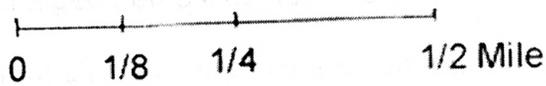
Map B. Laguna West
(1 major landmark,
1 minor landmark)



Map C. Elmwood
(5 major landmarks,
5 minor landmarks)



Map D. Four Colonies
(1 minor landmark)

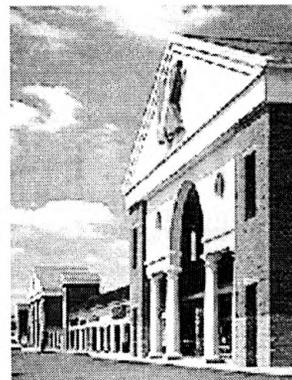


- | | |
|--|--|
|  Major path |  Major landmark |
|  Minor path |  Minor landmark |

Figure 9.5 Probable Landmarks of the Four Study Sites



Recreation Center Clubhouse

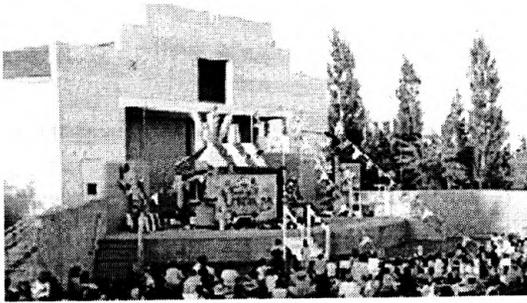


Shopping Mall

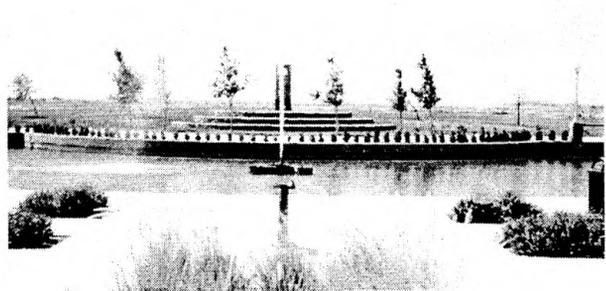
Figure 9.6 Landmarks in Kentlands

As shown in map B of figure 9.5 and figure 9.7, Laguna West has two probable landmarks: the town hall and the fountain in the mid-lake plaza. The fountain is located in the middle of a traffic rotary that is literally a geometric center of the site from which run five streets placed symmetrically. In turn, the town hall is placed slightly off center and located outside the rotary. Clearly, the fountain possesses a locational advantage as a landmark over the town hall; however, the town hall building's larger mass and distinctive design are probably more remembered by Laguna West users. Accordingly, the town hall is considered here a major landmark, while the fountain is considered to be a minor landmark. Nonetheless, Laguna West's landmarks resemble landmarks in any traditional community with a geometrical center. Such landmarks are highly perceptible for all users from all directions and are community focal points. In this sense, the New Urbanist attempt to create focal points may succeed well in Laguna West.

As shown in map C of figure 9.5 and figure 9.8, Elmwood has ten landmarks: five major landmarks and five minor landmarks. Most of these are

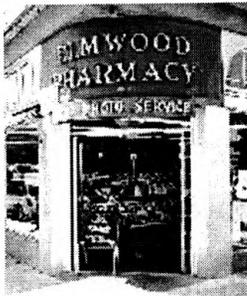


Town Hall



Fountain

Figure 9.7 Landmarks in Laguna West



Pharmacy



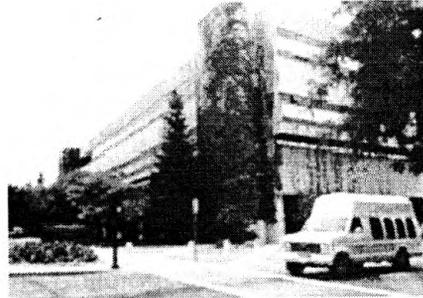
Bank



Coffee Shop



Theater

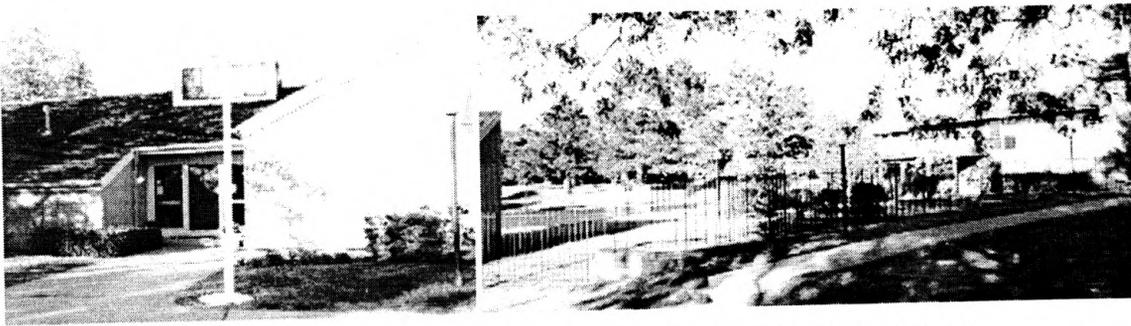


Hospital

Figure 9.8 Five Major Landmarks in Elmwood

located in Elmwood's shopping district. Major landmarks include a pharmacy, a bank, a coffee shop, a theater, and a hospital, while minor landmarks include a bookstore, a bakery, a hardware store, a garage, and a donut shop. Major landmarks are likely remembered by users because these landmarks are corner establishments with a distinct building character. Minor landmarks are also shops with unique character and are likely remembered by users, although these minor landmarks are with less locational advantage for legibility than corner shops. Unlike Kentlands and Laguna West, landmarks in Elmwood were not deliberately planned by designers but were developed by the business ingenuity of individual or corporate entrepreneurs. Even so, each building's unique characteristics effectively make these establishments legible point-references in Elmwood. Nonetheless, these landmarks can never be independent from legible paths; along which these places in turn become important landmarks.

As shown in map D of figure 9.5 and figure 9.9, Four Colonies has only one minor landmark: a community center. Although Four Colonies' community center could easily blend with the rest of the buildings due to a similar design scheme throughout the community, the community center's relatively large size and central location contributes to its probably being remembered by users. For Four Colonies residents the community center is probably familiar, also because office of owners' association is located in the building, and a swimming pool, two tennis courts, and a basketball court is located behind. However, Four Colonies' unifying building design and enclosed landscaping result in a lack of differentiation and a difficulty in creating discernable elements, including this



Community Center (front)

Community Center (back)

Figure 9.9 Landmark in Four Colonies

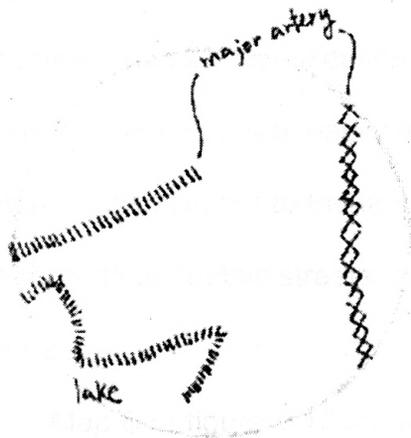
community center. In fact, there are two other community centers in Four Colonies, but their architecture is nondescript and hardly noticeable by visitors.

Based on the preceding analysis of landmarks, I rank Elmwood's legibility as high, Kentlands' and Laguna West's as medium, and Four Colonies' as low.

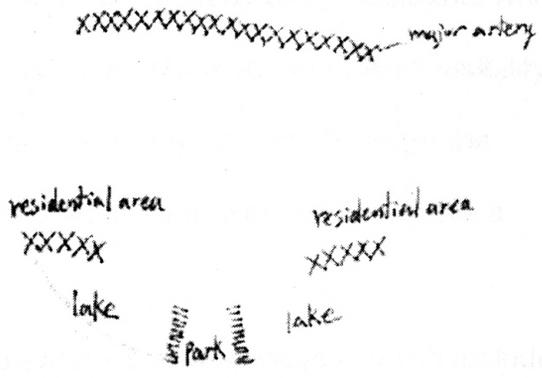
4. Edges

Edges are linear breaks or barriers in the urban environment, for example, shore lines, rivers and other topographical edges, railroad cuts, railway viaducts, elevated highways, walls, and edges of development.

Map A of figure 9.10 illustrates Kentlands' probable edges. These edges include major arterial streets and a lakeshore. Although these major arterial streets are considered legible paths, they are also considered legible edges because they are major auto routes. The widest and busiest, Kentland Boulevard, is regarded as a major edge and the second widest and busiest, Tschiffely Square Road, as a minor edge. These arteries' four-lane streets with dividing islands effectively break continuity from one side to the other and are



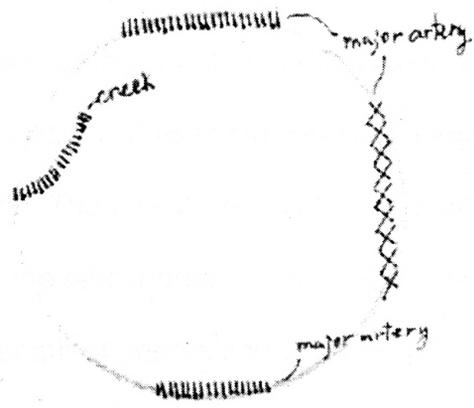
Map A. Kentlands



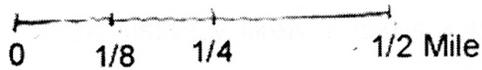
Map B. Laguna West



Map C. Elmwood



Map D. Four Colonies



XXXX Major edge ||||| Minor edge

Figure 9.10 Probable Edges of the Four Study Sites

likely to be remembered as edges by users. Kentlands also has a topographical edge generated by the lakeshore that is located in the study site. Residents who live by the lake no doubt easily remember the lake. However, the lake's visibility is more or less limited to the larger public because only about 500 feet of the lakeshore faces public streets, and this fact potentially makes the lakeshore a minor edge.

Map B of figure 9.10 shows Laguna West's probable edges, which include a major artery and lakeshores. Like Kentlands' major arterial streets, Laguna West's busiest four-lane street, Laguna Boulevard, is considered a major edge because users likely remember this street's strong dividing effect from one side to the other. Users also likely remember Laguna West's two kinds of lakeshores – shores by the residential areas and park. The lakeshores by the residential areas are considered major edges, while the lakeshores by park are considered minor edges according to the relative strength of impression of the edge. The distance to the opposite lakeshore in the residential areas is relatively small – about 300 feet – and this short distance likely invokes a sense of being easily able to reach the opposite shore in people's minds, but in reality, the residents have to make a considerable physical detour. This discrepancy between visual impression and physical reality likely causes a stronger sense of “edge” in people's minds. On the other hand, the lakeshores by the park faces a much wider and longer lake view and probably does not invoke such a sense of easy reach, therefore, the impression of edge is probably not as strong for in the lakefront of the residential areas. Laguna West effectively reinforces legibility by

creating a public walkway along the lake, although Laguna West's manmade lakeshores' legibility may be weaker than Kentlands' lakeshores' imageability due to the lack of topographical interest.

As shown in map C, Elmwood has no edges. Elmwood's topography is flat, and there is neither lakes nor wide highways in the study area. This fact may be a reflection of the ease of movement in the community because an edge, by definition, is potentially an obstacle against movement. Moreover, lack of planned public space may be another reason for no edges in Elmwood. As in Kentlands and Laguna West, some edges are byproducts of public space such as lakeshores and parkland.

As shown in map D of figure 9.10, Four Colonies has four edges: three arterial streets and a small creek. Like Kentlands' and Laguna West's busy four-lane boulevards, Four Colonies' busiest four-lane artery, Quivira Road, is considered a major edge and likely remembered by users because of the street's strong separating effect from one side to the other. Two other arteries are considered as minor edges because these are two-lane streets with less traffic than Quivira Road. Nonetheless, pedestrian users likely remember these arteries as edges because these streets with no sidewalks are virtually inaccessible to pedestrians. A small creek is one of few topographically interesting places and could be utilized as a Four Colonies' public space with a walkway like Laguna West's lakeshore. However, this creek is located in secluded woods behind a residential neighborhood with no walkways and is

probably known to only nearby residents and is therefore considered a minor edge.

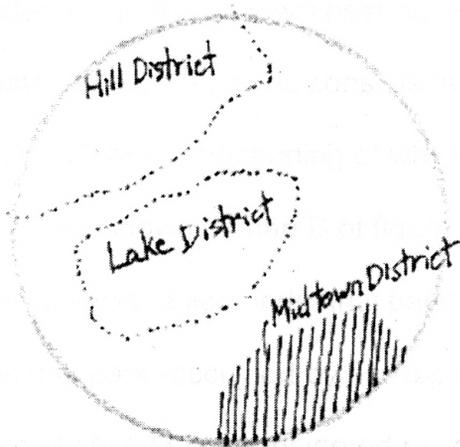
On the basis of this analysis of edges for the four sites, Laguna West's legibility can be ranked as high, Kentlands' and Four Colonies' as medium, and Elmwood's as low.

5. Districts

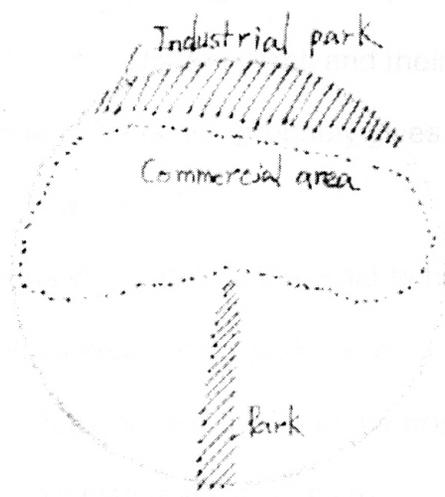
Districts are medium-to-large sections of the city recognized as having some particular visual and experiential character by users. Districts are conceived of as having two-dimensional extent so that the observer can mentally enter "inside of" the area, for example, a neighborhood, park, or plaza.

As illustrated in map A of figure 9.11, Kentlands can be said to have three legible districts. In fact, creating distinctive districts is a major intention of Kentlands' designers, and the result is areas the designers have called "Midtown District," "Hill District," and "Lake District." Midtown District includes cottages and live/work units, which provide housing above commercial spaces occupied by restaurants, retail stores, and entertainment facilities. This area is a mixed-use area and is considered a major district and likely most remembered and therefore the most legible district in Kentlands.

Hill District and Lake District are essentially single-family-dwelling residential areas and are considered here to be minor districts, with each having definable characteristics related to the sites' unique topography. As their names indicate, Hill District is on a hill and Lake District is by a lake, and these districts



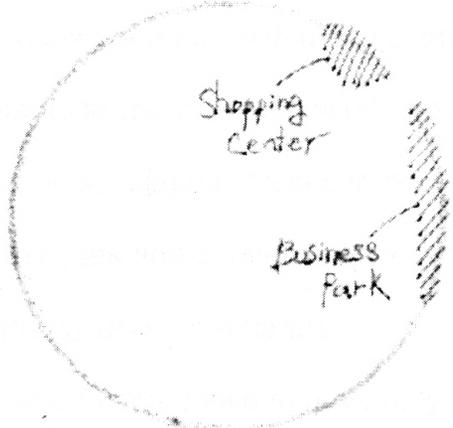
Map A. Kentlands



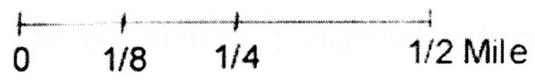
Map B. Laguna West



Map C. Elmwood



Map D. Four Colonies



 Major district
  Minor district

Figure 9.11 Probable Districts of the Four Study Sites

are easily discernable and likely remembered by users, though since they are residential areas, they will best be imaged by the districts' residents and their guests. In all, Kentlands consists of well-defined districts and probably gives users a clear understanding of which district they are in.

As shown in map B of figure 9.11, Laguna West also can be said to have three districts: a light industrial park, a commercial area, and a park. The industrial park (occupied by an Apple Computer factory) and a park in the portion of the study site are considered major districts because these are clearly demarcated, and most residents probably remember them without any difficulty. The commercial area also is likely remembered by users but is identified as a minor district here due to its potentially ambiguous boundary with an adjacent mixed-use area. In fact, housing above commercial space in the mixed-use area can be seen as pure commercial use. Nevertheless, Laguna West's formal street pattern, by and large, clearly defines land uses and creates legible districts despite the site's flat and uninteresting topography unlike Kentlands'.

As shown in map C of figure 9.11, Elmwood can be said to have only one district: a major shopping area on the centrally located College Avenue. The area is characterized as a conglomeration of neighborhood shops including restaurants and coffee shops, and this shopping area likely gives a strong impression in users' minds. The rest of Elmwood is largely of small-grained mixed uses, but this section of Elmwood cannot be identified as a district because each use is too small to form a clearly demarcated or large enough area.

As shown in map D of figure 9.11, Four Colonies can be said to have two identifiable districts: the Four Colonies Shopping Center in the northeastern sector and a business park on the eastern edge. Users likely remember these areas because their land uses are clearly defined as commercial and business districts and are easily distinguishable from the larger residential area. The rest of the extent of Four Colonies is comprised of low-density residential land use, which is not distinguishable in any way visually or environmentally. As its name suggests, the Four Colonies' designer's original intention was to create four distinctive districts, and, indeed, the community consists of four "districts" or "colonies" according to the original construction plan. However, these districts' boundaries are not legible for users because of the uniformity of land use and residential design.

Based on the preceding analysis of districts, I rank Laguna West's legibility as high, Kentlands' as medium, and Elmwood's and Four Colonies' as low.

Legibility and the Four Communities

Table 9.1 summarizes the rankings of the four study sites for the five elements discussed above. As the table indicates, Elmwood ranks high on the first three elements – paths, nodes, and landmarks – and therefore demonstrates the greatest legibility among the four communities. Since paths are the most important element for legibility, a high rank for paths indicates Elmwood's fundamental advantage over other communities in terms of clarity of movement

	Kentlands	Laguna West	Elmwood	Four Colonies
Paths	Medium	Medium	High	Low
Nodes	Medium	Medium	High	Low
Landmarks	Medium	Medium	High	Low
Edges	Medium	High	Low	Medium
Districts	Medium	High	Low	Low
Total	5 mediums	2 highs 3 mediums	3 highs 2 lows	1 mediums 4 lows

Table 9.1 Rankings for Legibility

and spatial orientation. Elmwood's paths are mostly long straight streets forming a rectangular grid with a clear directional layout. These paths are experientially predictable yet memorable and also helped by distinctive landmark buildings. These landmarks, although mostly unplanned, are for the most part corner establishments and are conversely dependent on the paths on which the establishments are located. Strong mutual support between paths and landmarks would seem to make Elmwood fundamentally imageable. Legible paths and landmarks also support Elmwood's nodes, which are mostly intersections.

In contrast, with only one district and no edge, Elmwood ranks low on edges and districts. This is partly because Elmwood has no planned public space to create a public presence and clear sense of boundary. Nonetheless, Elmwood's few edges and districts are a reflection of the ease of movement in the community because edges and districts potentially delimit movement. Moreover, Elmwood's small-grained land use cannot form identifiable districts but

juxtaposes architectural variety and creates a memorable environment that, in turn, encourages various activities on the streets for example, recreational shopping. In a sense, Elmwood's few districts and edges paradoxically reinforce the legibility of paths, nodes, and landmarks by encouraging users' street movement.

As table 9.1 indicates, Laguna West is ranked with three mediums and two highs, which places the community slightly behind Elmwood in terms of legibility. Although Laguna West's coarseness of pathway system leads to that community's ranking behind Elmwood, Laguna West's paths (which comprise a formal symmetrical street layout with directional clarity) contribute to the community's legibility as a whole by helping to create and reinforce the other elements for legibility. In a sense, geometry is effectively utilized in Laguna West to create a memorable environment. Laguna West's landmarks, for example, are purposely placed as central focal points like typical landmarks in a traditional community and are not so much dependent on street traffic, a situation which contrasts with the traffic-dependent landmarks in other study sites (e.g., the corner establishments in Elmwood and the shopping mall in Kentlands).

However, when a clear geometry is supported by public traffic, legibility is heightened considerably. In fact, edges and districts in Laguna West are not only supported by such geometrical ingenuity like the formal street pattern, but also by public traffic, and these twofold supports would seem to make Laguna West's edges and districts rank high in terms of legibility. Laguna West's manmade lakeshores, for instance, are already moderately imageable edges

with a clear symmetrical geometry, yet these shores are further made public by adding walkways. Such civic-minded design reinforces these shores' legibility and, indeed, these lakeshores can be identified as strong legible edges contrasting with Kentlands' and Four Colonies' less imageable lakeshores and creek that are for the most part kept in private.

All five elements for legibility are explicitly expressed in Laguna West and greatly helped by the use of formal geometry in street design. Nonetheless, the community still lacks legible paths to reinforce other elements of legibility with the result that paths, nodes, and landmarks are not ranked as high in Laguna West as they might be otherwise.

As table 9.1 indicates, Kentlands demonstrates a lesser degree of legibility than Laguna West with all five elements ranking in the medium category. Kentlands' pathway system consists of a confusing street grid of loops and cul-de-sacs. These pathway characteristics probably create an ambiguous overall image in users' minds and undermine pathway legibility despite the fact that there are many streets in the community. Since other elements for legibility are largely dependent on paths, Kentlands' complicated street system negatively affects other elements' legibility and, therefore, environmental legibility as a whole. Nevertheless, Kentlands' land use pattern in harmony with the community's varied topography helps to create imageable elements. Further, strong interdependence among nodes, edges, and districts and distinctively designed landmarks and districts reinforce each element's legibility and provide Kentlands with a reasonable degree of legibility.

In short, Kentlands has a number of potentially legible elements with a gracious design expression; however, many of these elements are difficult to find due to the lack of legible paths.

As table 9.1 indicates, Four Colonies is the least legible community, incorporating only one medium ranking and four low rankings. In spite of the large number of streets in the community, Four Colonies' paths rank low due to a directionally ambiguous pathway system. Dominating collector streets, segregated pedestrian pathways, and numerous cul-de-sacs and loops demonstrate Four Colonies' strong auto-oriented tendency by which the auto users' mental map becomes the only image of the community. In other words, Four Colonies' elements for legibility are mostly reduced to a reflection of auto users' experience. Four Colonies' nodes, for example, are not only path-dependent but also exclusively auto-dependent, since all nodes are traffic intersections without any pedestrian sidewalks.

Such an auto-oriented environment weakens the legibility of most of Four Colonies' environmental elements, since fast moving and isolated automobiles lead to a movement-based environmental experience. For instance, many auto users probably cannot easily recognize Four Colonies' landmarks and the boundaries of most residential districts (both of which rank low in terms of legibility).

Ironically, by being pedestrian-hostile, Four Colonies' auto-friendly environment creates the most legible elements in the community – edges shaped by major arteries with no sidewalks and having a strong separating effect against

pedestrian movement. Being nearly inaccessible to pedestrians, Four Colonies' paths largely promote a limited mode of environmental interaction by auto users only. In this sense, an authentic public realm accessible to everyone is lost in Four Colonies, and one result is minimal legibility.

Overall, Elmwood as a traditional streetcar community exhibits the greatest legibility of the four study sites, having such positive qualities as a clear spatial layout, mutual support of image elements, inclusive accessibility, and distinctive architectural character. On the other hand, Four Colonies as representative of a conventional suburban development, is the least legible community with few environmental qualities contributing to a coherent and comprehensive environmental image. The two New Urbanist communities, Laguna West and Kentlands, share some of Elmwood's imageable qualities but not all. Laguna West, with a clear spatial orientation and inclusive accessibility, ranks second to Elmwood, while Kentlands, with a mutual support of image elements and a distinctive architectural character, ranks third. Since Lynch (1960) claims that paths are most significant in terms of legibility, Laguna West's positive qualities closely related to legible paths have an advantage over Kentlands' less clear pathway layout. Partially capturing some pre-auto environmental qualities for legibility, these two New Urbanist communities are certainly more legible than a conventional suburban plan like Four Colonies but are still less successful than a smaller-block, higher-density, mixed-use community like Elmwood.

CHAPTER 10

AN OVERALL EVALUATION AND THE PROSPECTS FOR NEW URBANISM

This chapter presents an overall evaluation of the four study sites in terms of responsiveness, which is interpreted in terms of the three responsive-environment qualities of permeability, variety, and legibility. I then discuss the viability of New Urbanism in light of these evaluation results.

Evaluating the Four Study Sites

Table 10.1 is an integration of the earlier rankings from the three previous chapters and helps to identify the relative degree of responsiveness for the four study sites. As the table indicates, Elmwood ranks as the most responsive community with 11 highs and two lows. With 13 mediums, Kentlands ranks second, and Laguna West ranks third with two highs, eight mediums, and three lows, while Four Colonies ranks as the least responsive with two mediums and 11 lows.

From table 10.1, we can conclude that Elmwood ranks highest for all three responsive environment design qualities, and Four Colonies ranks lowest, while the two New Urbanist communities rank in between. More specifically, Kentlands ranks higher than Laguna West in terms of permeability, whereas, in terms of variety, they rank the same. In terms of legibility, on the other hand, Laguna West ranks higher than Kentlands. Since the authors of *Responsive Environments* suggest that the qualities of permeability, variety, and legibility are

Permeability	Kentlands	Laguna West	Elmwood	Four Colonies
Pathway system	Medium	Medium	High	Low
Street patterns	Medium	Medium	High	Low
Access points	Medium	Low	High	Medium
Intersections	Medium	Medium	High	Low
Aggregate street length	Medium	Low	High	Low
Number, size, and shape of blocks	Medium	Low	High	Low
Total	6 mediums	3 mediums 3 lows	6 highs	1 mediums 5 lows
Variety	Kentlands	Laguna West	Elmwood	Four Colonies
Land use	Medium	Medium	High	Low
Primary and secondary use	Medium	Medium	High	Low
Total	2 mediums	2 mediums	2 highs	2 lows
Legibility	Kentlands	Laguna West	Elmwood	Four Colonies
Paths	Medium	Medium	High	Low
Nodes	Medium	Medium	High	Low
Landmarks	Medium	Medium	High	Low
Edges	Medium	High	Low	Medium
Districts	Medium	High	Low	Low
Total	5 mediums	2 highs 3 mediums	3 highs 2 lows	1 mediums 4 lows
Grand total	13 mediums	2 highs 8 mediums 3 lows	11 highs 2 lows	2 mediums 11 lows

Table 10.1 Rankings for Responsiveness

hierarchical in nature, and the existence of permeability promotes and enhances the existence of the other qualities (Bentley et al, 1985), Kentlands can be said to have an advantage over Laguna West, since its permeability indicators rank higher.

In addition, the authors of *Responsive Environments* emphasize that these responsive environment qualities are mutually supportive. Kentlands demonstrates such mutual support, since all of its permeability rankings are at the medium level whereas Laguna West has three low permeability rankings – access points, aggregate street length, and block characteristics. Yet again, Elmwood’s high permeability rankings indicate a strong base for variety and legibility, while Four Colonies’ five low permeability rankings help explain why its variety and legibility rankings are weak.

As table 10.1 also indicates, Elmwood is the most responsive environment of the four study sites, even though the community ranks low on the two legibility themes of edges and districts. However, these lower rankings are a reflection of the community’s pre-World War II character when such a concept as planned public space in a residential area did not exist. In this sense, responsive environment qualities may not perfectly correspond with a pre-auto era environment. Nonetheless, we can conclude that, for the most part, Elmwood is one good example of a responsive environment.

As the second most responsive environment, according to table 10.1, the New Urbanist community of Kentlands demonstrates a well-balanced responsiveness, although this responsiveness could be stronger, since the study

site scores only mediums for all 13 themes evaluated. Kentlands possesses all the qualities of responsive environments without ranking low on any themes, unlike Laguna West, which ranks low on three themes. Therefore, it can be said that Kentlands touches all aspects of a responsive environment to a significant degree. In this sense, Kentlands is a kind of responsive environment having responsive environment characteristics, although Kentlands is not as responsive as a traditional community like Elmwood.

New Urbanist Laguna West ranks as the next responsive environment after Kentland. Although its overall rankings are not much different from Kentlands, Laguna West does not show the well-balanced responsiveness that Kentlands does, since it is ranked with three lows and two high as well as eight mediums. This scattered ranking distribution from high to low may demonstrate that the community is not consistent in its design principles and results. Especially, Laguna West's low-density character, which receives low scores for three of the permeability themes, may have led to a site design that inhibits permeability and therefore weakens variety and legibility as well.

As also shown in table 10.1, Four Colonies ranks as the least responsive environment. Evidenced by the many low rankings, in table 10.1, Four Colonies reveals its lack of responsiveness in most aspects. Although the community ranks at a medium level on two themes – access points and edges – these results are rather odd reflections of overwhelmingly negative characteristics like numerous cul-de-sacs and loops and nearly complete pedestrian inaccessibility. Unlike Kentlands, which encompasses all three responsive environment themes

to a meaningful degree, Four Colonies has few qualities of a responsive environment. In this sense, it can be said that Four Colonies is a different kind of development from the more responsive patterns exemplified by the three other study sites. This difference, of course is very much so because Four Colonies was developed with an auto-dominant design in mind, unlike the other study sites.

The Prospects for New Urbanism

As the preceding evaluation demonstrates, the two New Urbanist communities considered in this thesis have created more responsive environments than a conventional suburban development like Four Colonies, yet as the evaluation also indicates, these communities do not have the greater range of responsiveness of a more traditional community like Elmwood. To indicate how a New Urbanist community can in fact fully incorporate responsive environment qualities, I want to end this thesis by briefly presenting such a design – the New Urbanist community of Eastgate Town Center located five miles from downtown Chattanooga, Tennessee.

Shown in figure 10.1, the Eastgate Town Center master plan was adapted by the city government of Chattanooga in 1998 and involves the transformation of a failed shopping mall (Dover, Kohl & Partners, a, b) that had been built in the 1960s but was devastated by a newer 1980s mall built several miles farther outside of Chattanooga (Peirce, 1999). Designed by the New Urbanist firm of Dover, Kohl & Partners, this project includes a multipurpose town center that

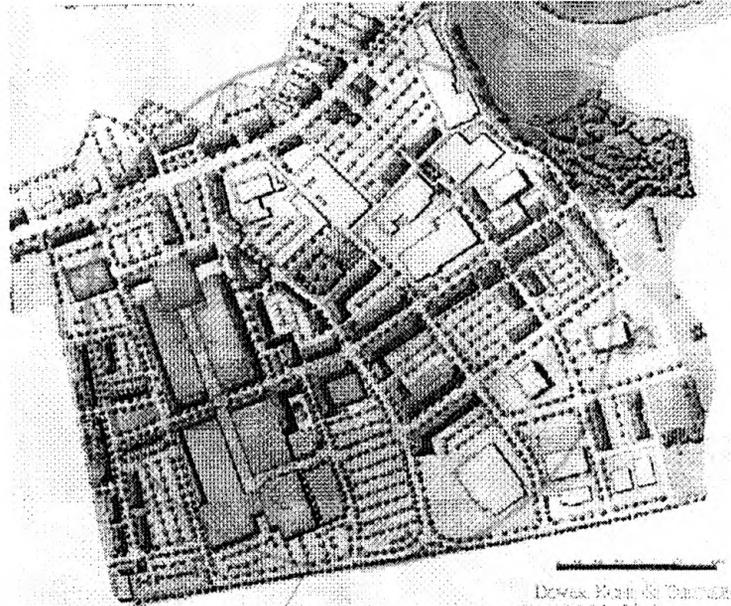
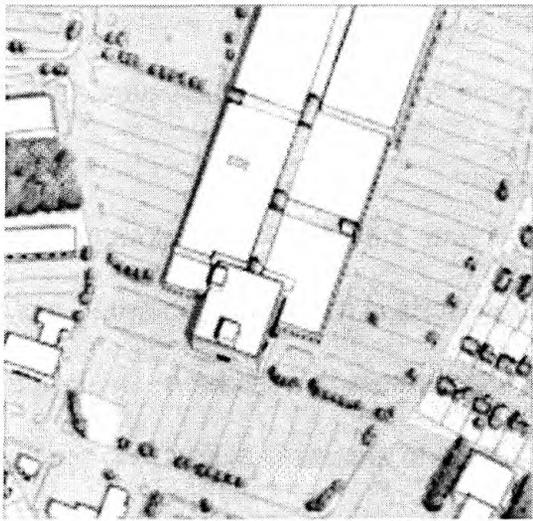


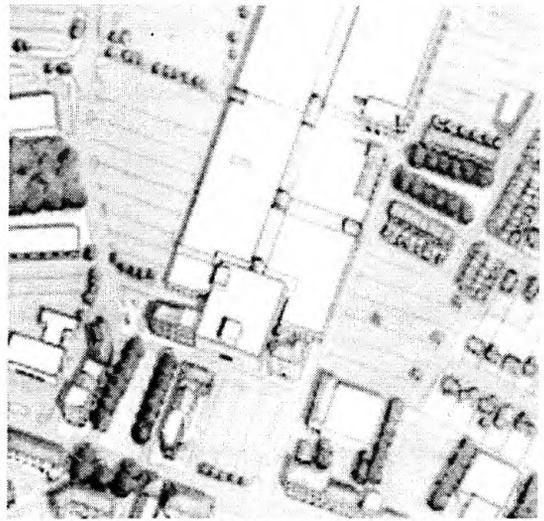
Figure 10.1 Site Plan for Eastgate Town Center
Area of 1/4-mile radius indicated by circle

incorporates an older mall structure in a new street grid with retail, residential, and workplace construction (Peirce, 1999). The plan comprises a substantial reconfiguration of the mall property, infill development in the surrounding parking areas, and new development to connect the new uses with a surrounding neighborhood and nearby office park (Dover, Kohl & Partners, a). An emphasis is also placed on creating a plan that can be implemented incrementally, thereby responding to market demand. As figure 10.2 illustrates, the original mall building is to be gradually replaced with mixed-use buildings arranged to form well-defined public streets and spaces (Dover, Kohl & Partners, b).

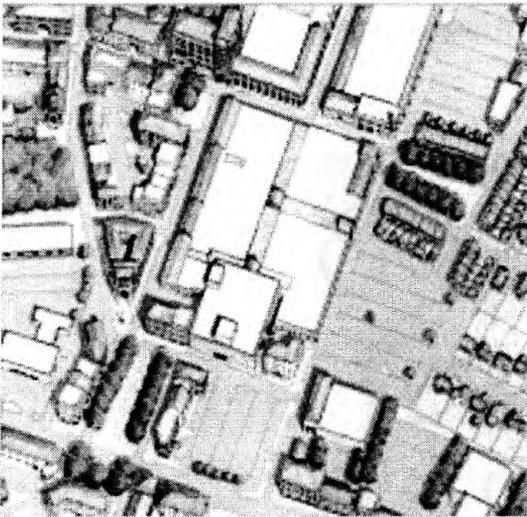
In the initial phase of this project, illustrated in figure 10.2b, the mall's blank walls have been refurbished by a brick façade and replaced by outward-facing storefronts and a two-story office building (Peirce, 1999, Dover, Kohl & Partners, b). Already in 2001, businesses are leasing these storefront spaces on



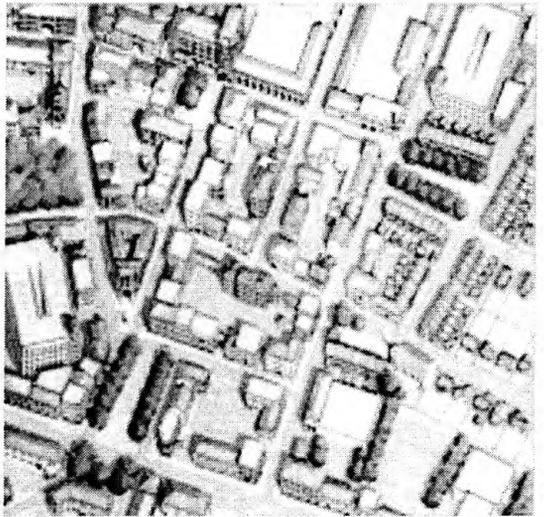
a. 1998 Condition



b. Initial Projects (to be completed by 2002)



c. Developments by 2020



d. Long Term Developments by 2030

Figure 10.2 Development Phases for Eastgate Town Center

the square, and the mall has also re-leased one of the empty department stores that now houses a large telemarketing center (Dover, Kohl & Partners, b). Thus, offices with many jobs have joined the mall. A YMCA, a day-care center, a skating rink, a hotel, and numerous stores have also been added to the site (Peirce, 1999). The design impact of these projects is strong and has attracted a variety of establishments to the town center within a short period of time. In other

words, the renovation has created a dramatic contrast to the monotonous mall, which consisted of only a big-box shopping center surrounded by large parking lots.

In looking at figure 10.1, one immediately notices the permeable pathway layout of the design, which is shown more clearly in figure 10.3, an axial map of the project. In addition, the permeability and new buildings add variety of function and legible elements of nodes and landmarks to the empty site. Also, the multi-story buildings help anchor the sides of the town square, and businesses in taller buildings benefit from greater visibility (Dover, Kohl & Partners, b).

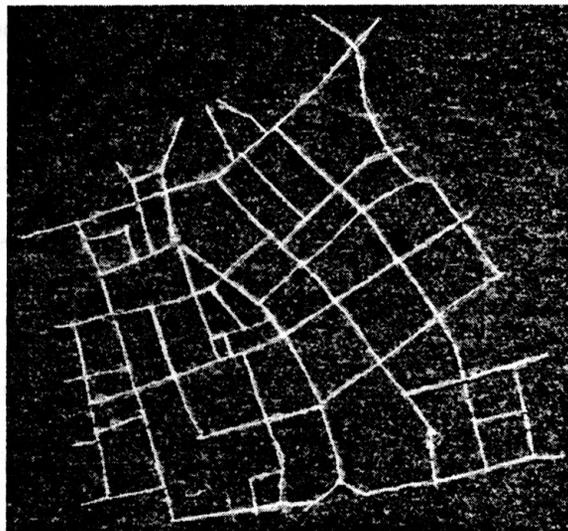


Figure 10.3 Axial Map of Eastgate Town Center

As the project advances in stages over time (See figure 10.2 c and d), one notes how the permeable street pattern is further strengthened, and the project eventually will have a network of interconnected streets and blocks, with buildings abutting streets and easily accessible public spaces. In addition, a new formal street will connect the mall structure with nearby residential streets and

office development. The pathway system also includes pedestrian-friendly connections to adjacent neighborhood areas and eventually leads users to nearby wetlands and a proposed greenway that includes a major hiking trail and (Dover, Kohl & Partners, a).

The variety of functions in the project will also be very high because most of the fifty acres of the former mall parking lots will become new housing, parks, civic buildings, and a town square (Peirce, 1999). Since there are also work places and shops in the redesigned mall building, combined with new housing nearby, there will be an ideal mixture of different primary uses and mutual support between these primary uses and additional secondary uses. Providing mixed-use buildings and varied public spaces will also help to generate a high degree of variety in the area. Moreover, most of these varied functions are located within a quarter mile radius, or five minutes walking distance. Thus, users' variety of environmental experience will be wide-ranging yet easily accessible.

In terms of the project's potential legibility, there are many elements that will make the neighborhood highly imageable. The coherent street pattern coupled with well-defined street spaces are memorable features and should be perceived as strongly legible paths by the users, while the well-designed public squares should be remembered as legible nodes. Moreover, some of the public establishments like the YMCA, day-care center, skating rink, hotel, and eventual church should become legible landmarks as well as multi-story buildings and civic structures strategically located on the site. The wetlands to the east should

work as a legible edge as should the clearly defined boundaries of Eastgate itself.

In short, the responsive environment qualities of permeability, variety, and legibility are effectively created in the New Urbanist design for Eastgate Town Center. As this development demonstrates, more new ideas and efforts are forthcoming from New Urbanists, and the vigor and acumen indicated by Eastgate prove the movement's potential for the future.

Many modern suburban developments in the United States have often created a placeless situation and an environmental isolation by separating people and place and providing environmental choices that are limited in terms of pedestrian accessibility. Although efforts like New Urbanism hope to reverse this current situation, "natural gravity" still leans towards the low-density, auto-dependent suburbs, thus, an alternative vision of community development based on a clear understanding of how real-world communities actually work is crucial today. A sense of place and humanly scaled community can be achieved only through deliberate action in the planning and design process. As Hall et al. (2001) write, "True communities do not just occur; they are born of vision. Where no vision for growth exists, sprawl results" (ibid, pp. xxi-xxii).

The work of the New Urbanism offers one powerful model around which this vision might unfold.

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