Principles and Practice of Urban Design: Towards an Integrated Project Assessment Model for City Planning

By

Ian R. Shaw

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF CITY PLANNING

Department of City Planning
University of Manitoba
Winnipeg, Manitoba

October, 1991

ISBN 0-315-76806-1

PRINCIPLES AND PRACTICE OF URBAN DESIGN: TOWARDS AN INTEGRATED PROJECT ASSESSMENT MODEL FOR CITY PLANNING

BY

IAN R. SHAW

A thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF CITY PLANNING

To Kimberly, You are my greatest inspiration.

Abstract

This thesis explores the theoretical and practical influences on contemporary urban design planning in order to develop a workable methodology and evaluation model for design review. It recognizes that the diverse nature of the urban design field has made it increasingly difficult to find meaningful parameters of design-related impact that relate development policy to specific physical design projects, while at the same time, connecting urban design theory and practice. On the basis of an extensive literature review, the thesis argues that both formal and informal review procedures should have as their basis a set of measurable design attributes which can be related to larger dimensions of planning performance.

The Project Assessment Model (PAM) presented in the final section consists of 45 review criteria grouped into seven design elements. These design elements are further grouped into three performance dimensions that are intended to approximate transpatial qualities which contribute to the liveability of all urban environments. These performance dimensions are: *Character and Interest*, *Contextual Integrity*, and *Environmental Liveability*. A weighting system is also developed so that the PAM can be calibrated to reflect local priorities and interests.

Five basic conclusions are reached: 1.) the PAM provides a consistent and reliable review mechanism thereby facilitating the comparison of different projects or policy directions; 2.) the PAM strengthens the relevance of design review by relating planning policy to design theory; 3.) the PAM serves as a common design language which facilitates the discussion of development proposals in all types of review situation; 4.) the PAM requires additional testing to refine its validity as a decision-making mechanism; and, 5.) the potential exists for identifying new applications of the PAM as an exploratory tool within the planning process.

Acknowledgements

This thesis is in part a product of the assistance that has been provided to me by a number of individuals and organizations. I wish to thank my committee members – Dr. Mario Carvalho, Professor Geof Bargh, and Professor Carl Nelson – for their helpful comments and criticism at all phases in its preparation. I am equally indebted to my fellow classmates, friends, and family for being a better person because of our association.

Several people deserve special recognition for their guidance as I enter into the planning profession – Dr. Geoffrey C. Smith, whose insightful interpretation of the urban environment lead me to develop my own fascination with the city; Peter Monteith, Gerry Couture, and Doug Clark, for the opportunity to develop my own thoughts about urban design and planning; and, the Downtown Brandon Business Improvement Area, for affording me the opportunity to give something back to my community.

Finally, I am grateful for the financial support of the Canada Mortgage and Housing Corporation, without which, this research would not have been possible.

List of Figures

Table of Contents

PART I

Introduction

CHAPTER ONE

THE ROOTS OF URBAN DESIGN IN CONTEMPORARY PLANNING PRACTICE

"The answers to many problems lie at the end of a winding road. If you do not set out, you will never arrive."

– Jonathan Barnett, 1974

"...the vital tasks of city design, the creation of the collective work of art, remain for the most part an unfulfilled dream, and the lack of town planners as creative space-time designers and effective design coordinators continues."

– Patrick Geddes, 1915

Almost throughout history there has been an universal interest and fascination with the physical form of human settlements. The contributions of planners and architects in shaping these environments cannot easily be overlooked since these professions have played a major role in determining the structure of urban places – their buildings, streets, parks, and plazas. Over time, however, the many factors and philosophies which have guided their actions have changed to reflect the social, political, and environmental conditions affecting society at-large. This has caused a myriad of settlement forms and city building techniques to be realized. In this sense, it has long been the challenge for architects, planners, and policy makers to search for those aspects of the physical environment which contribute to the liveability, richness, and diversity of our towns and cities. To a considerable degree, this challenge remains a significant one today.

1.1 An historical context for urban planning

As the drive towards urbanization began, ancient civilizations were faced with the first significant decisions in city development. The same challenges of urban life which still must be overcome today as a significant part of the urban planning field were present – to build a

place to live; to provide suitable housing and adequate services; to construct public buildings and transportation routes; to defend and secure the city; and, to manage and administer the growth of the urban place. To guide them in meeting these demands, these societies relied heavily on the strength of the intuitive associations that they had formed with the environments in which they lived (Rykwert, 1988). The city was viewed as a microcosm of the universe, and by structuring it accordingly, man's relationship to god and the world around him was brought to life. As a result, the form and location of the city can be said to have been dictated in certain instances by the requirements of important religious festivals and ceremonies as well as by the superstition and fear that necessitated them. Similarly, the provision of a defensible environment was central to the planning and organization of these first urban places. This is evidenced by the remains of many towns and cities which show that often a substantial fortification was constructed and maintained to mark their outer limits. These walled towns represented a compact settlement form that was confined and structured by the areal limit of the existing wall. The density and continuity of the resulting environments are attributes which are highly valued by designers even today.

However, as advances in technology, food production, and government afforded the development of even larger urban areas, it became necessary to breach the fortification wall. This is a critical point in the development of an historical context for the practice of urban planning. For the first time, inhabitants of urban places not only had to appreciate the compact settlement form and the positive sense of space which was so distinctive in those parts of the town inside the fortification wall, but they also had to *actively investigate* alternative techniques for connecting inside and out; new and old; well-formed and formless (Barnett, 1986; Lynch, 1984; Mumford, 1961; Sprieregan, 1965). The thematic association of these investigations to the present practice of urban design is significant. Interpreted as an activity which is something greater than the intuitive appreciation of urban form and development, it is this seeking out of alternative physical design solutions which marks the beginning of the practice of urban planning and design.[1,2]

1.2 A working definition of urban design

It is important at this point to understand more fully what is intended by the term *urban design.* By definition, 'design' refers to the creative art of arranging various elements into a compositional work like a building or city, while 'planning' relates to the development of detailed schemes for undertaking a particular course of action. In this light, there is an *a priori* connection between urban design and urban planning as a direct consequence of the relationship of architecture to the larger processes of city building. Throughout history, this relationship has been expressed in various ways. For example, the early Renaissance masters relied on the association of specific architectural patterns (i.e. symmetry, axis, or perspective) with particular design intentions (i.e. justice or truth) to direct their planning practice, while the architects of the Modern Movement rallied around well known design tenets like "Less is More" and "Form follows Function". These various expressions are unified by the fundamental belief that urban planning can respond to the intrinsic needs of society through design by communicating a higher meaning or purpose in the physical form of the built environment (Rapoport, 1982). The emphasis here is placed on "designing" and the underlying aesthetic and visual qualities of the environment as critical determinants of this process. From this perspective, the urban planning decisions of the past have tended to reflect an aspiring concern for artifice while planning itself has been viewed as an art (see for example, Bacon, 1967; 1985; Cullen, 1961; Geddes, 1915/1968; Lanchester, 1925; Sitte, 1885/1986; Unwin, 1909/1971). There is little effective separation between design, architecture, and planning. Practically, they are viewed as critical parts of the same enterprise with the pursuit of beautiful and well-designed environments comprising their central objective.

In contrast, the modern practice of urban planning is perhaps best defined as a complex decision-making process within which pure design often plays only a modest role.[3] Friedmann (1987, 1988) identified the trend which moved planning toward this position as a reaction to the increasing dissatisfaction with the traditional practice of planning prior to and during the

post-war years. This dissatisfaction reached its peak with the growing number of proposals for urban renewal and freeway development projects in many North American cities during the 1950s and 60s (Jacobs, 1961; Tindal & Tindal, 1984). Planners (many for the first time) were being challenged during this period to openly demonstrate the social relevance of their physical design proposals. They were required to isolate and identify the positive and negative impacts of new projects in a more substantial manner than had been required at any time in the past.

Davidoff (1965) explained the essential nature and rationale for these developments in the following way –

> "The prospect for future planning is that of a practice which openly invites political and social values to be debated. Acceptance of this position means rejection of prescriptions for planning which would have the planner act solely as a technician...[and which] sharply reduce the unique contribution planning can make: understanding the functional aspects of the city and recommending appropriate future action to improve the urban condition" (p. 331).

The net effect was a shift away from the role which many planner's had previously occupied to new fields of interest – "They became facilitators, regulators, implementors, mediators, simulators, and occasionally political insiders" (Kreditor, 1990, p.156). This required a corresponding adjustment in the skills which planners needed to function adequately. Process and implementation often became more important than the final product which these processes were intended to realize. Furthermore, design came to be valued only in its relationship to other key areas like economic development and strategic planning.

In real terms, the cumulative effects of this shift in orientation are not yet completely understood. Recent investigations are, however, pointing to the weaknesses of the stream-lined policy plans which the years following the 1970s produced. While they may have been very effective at generating large amounts of capital investment and regulating the pace of development, they have also not produced satisfying urban environments. Of these findings

Alan Kreditor (1990) has concluded that,

> "Our urban surroundings suggest that planners know much less about design than they should and architects know much less about city building processes than they claim. The roots of their shortcomings stem largely from educational traditions and *the growing separation between architecture and planning...*"(p. 157, emphasis added).

The main point is that the substantial gains which have been made in achieving a consistent and ordered planning process have resulted in the development of a new "technicality" which has further divested planning from its early heritage as an activity concerned solely with the physical environment and its design. Paradoxically, perhaps, these same developments lead to a renewed interest in the form and structure of the the urban environment (Palermo, 1990). It is this interest which has worked to formalize the modern field of urban design.

It is significant to note that as this contemporary urban design has emerged, its scope has moved well beyond that of the roles traditionally associated with either the architect or the planner. Urban design begins where city planning leaves off and starts before architecture begins. Similarly, it rests between the more traditional design-oriented practice of city planning and the complex planning environments of the present day by placing an equal emphasis on the physical and functional dimensions of the built environment. It is both multi-disciplinary and inter-disciplinary in its approach (Kreditor, 1990; Palermo, 1990). Quantitatively, contemporary urban design is a means-to-ends process which actively recognizes that the built environment supports and enhances the quality of life in the city. Intervention, change, regulation, designing, and building are all activities which are considered to be a part of this larger process of urban designing. The purpose of which

> "...is to synergize those constituent factors in our society which have form generating capabilities to build a physical environment which will be representative of the needs of our society [functional, aesthetic, social, ecological, psychological, economic, etc.]; to provide richness and diversity; to communicate value and meaning; and to increase personal choice" (Asad et al., 1984,

p.4).

The range of influential ideas and areas of study that are generally accepted to have relevance to the practice of urban design is very diversified. It can be broken down into six broad areas of concentration. The first relates to the interpretation and understanding of the symbolic meaning of the urban environment. Closely associated with the research of architecture, anthropology, and sociology, this area places emphasis on the role the environment plays in shaping our experiential awareness and appreciation of cultural, societal, and personal symbolisms. The second general area relates to the theoretical development of design theory as it has been applied to the environment at the urban scale. Primary consideration is given here to the visual and aesthetic qualities of the city. Especially important in this regard are the normative positions which designers have maintained at various times in addition to techniques and strategies which they have utilized to achieve them. This research area is predominantly concerned with the manipulation of the built environment through design and building.

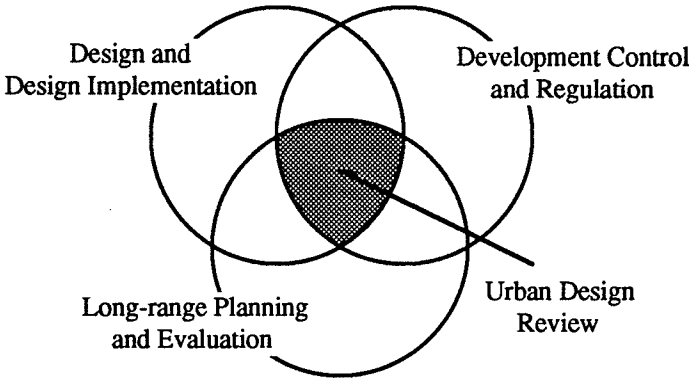
In contrast, the lead role in the third area of concentration has been played by participating researchers in all fields of the social sciences. It is related to the assessment of the impacts of the urban environment on human behaviour. This research has blurred the distinct separation which has traditionally been maintained between the physical and human dimensions of city planning. The fourth area concentrates on the relationship between planning, design, and the natural physical environment. The primary focus of much of this research has been directed at environmental impact analysis, alternative design techniques, and developing ecological models for planning and design. The fifth grouping gives special consideration to the nature of the design process itself. Recent investigations in this area have affirmed the importance of expanded participatory design contexts and the design thought process. Finally, the sixth area that has warranted consideration analyzes the urban design programs and review processes that have been instituted as a part of the planning process in most jurisdictions. It is a growing area of interest that associates urban designing with the

political decision-making process, funding programs, and regulatory environments.

1.3 The problem stated – Ineffective urban design review

From the practitioner's standpoint, urban design planning is a synthesis of three basic activities. *Design and design implementation* focus on the active processes of designing a physical project and constructing it on a particular site. *Development control and regulation* involve controlling the impacts of the development process in order to sustain the lasting visual, aesthetic, and contextual qualities of the urban environment that contribute to its overall liveability. Finally, *planning and evaluation* require working towards medium and longer range design goals by carrying out specific urban design strategies. While each of these "roles" places different demands on the urban designer in terms of planning and design abilities, it is equally evident that they are mutually dependent and reinforcing. The process which brings together aspects of all three of these design planning roles is *urban design review* (See Figure 1.1).

Figure 1.1 - Urban design review and its relationship to the three basic urban design planning *roles*.



Urban design review consists of any formal or informal procedures established for the purposes of evaluating the design-related characteristics associated with proposed development and/or re-development projects.[4] Design review has many applications that reflect this tripartite distinction in urban design planning. For example, it has been used to assess how well projects meet established visual and aesthetic criteria that reflect the character of their

sites in addition to planning goals that have been articulated for the city as a whole. Design review also represents one of the preferred regulatory mechanisms that have been developed for testing development proposals for compliance with restrictions that are contained in municipal zoning by-laws. Similarly, design review has been utilized to compare the relative merits of specific proposals that have distinctively different implications for the same site location. The main point is that the application of design review procedures affords planners with a means of quantifying the intangible merits of specific design proposals by establishing a basic framework of investigation and identifying pertinent design-related review attributes. This type of investigation procedure enhances their ability to understand the impacts of a project for its site; in contrast to competing proposals; and, with respect to the policies for growth and development contained in official plans and supporting by-laws. In this way, design review plays a substantial role in helping to shape and effectively meet important urban design objectives.

The fact that some form of urban design review occurs for most projects is not in itself surprising. This is because design always culminates with a conscious decision based on an evaluation of its possible consequences for the future (Gold, 1980; Rapoport, 1977b; Tzamir & Churchman, 1984). In fact, the activity of urban design as it was defined in the previous section is predicated upon the decision to take action. The problem is that it is becoming increasingly more difficult for urban designers to objectively discern appropriate goals, objectives, and decision-making parameters within the context of this diversified field. Where aesthetic judgement and design theory once operated as the sole organizing mechanisms for design inquiry, today's urban designer lacks a similar coordinating methodology. The various positions taken with respect to *quality urban design* all seem to act as competing notions of those attributes that are desirable or even merely acceptable for a given design proposal. To compound this problem, the urban design field is being challenged to recognize a widening circle of concerns that threaten to alter its identity even further. Taken together these conditions make project assessment exceedingly difficult, highly subjective, and time

consuming. Given that Cats-Baril and Gibson (1986, 1987) have concluded that the evaluation of development proposals is becoming a larger and more important component of the regulatory functions performed by municipal and regional governments, it is likely that these problems will continue to inhibit effective design review for some time to come.

1.4 The purpose[5]

The purpose of this thesis is to provide a conceptual framework within which it should be possible to create a workable project assessment model for urban design review. The intention is *not* to develop a technically accurate or precise evaluation mechanism at this stage. Rather, this thesis works to expand upon the "state of the art" in urban design planning thought by relating critical design notions and formative planning constructs to the design review process. Given the exploratory nature of this research, it is expected that this thesis will contribute significantly to an innovative definition of design suitability. Similarly, it is expected that the findings of this thesis will serve as a basis for the further investigation of the critical strengths and weaknesses of current urban design review procedures.

To accomplish this task, this thesis will investigate the following questions about the contemporary practice of urban design – "On what basis do urban designers make decisions?"; "What types of information are most useful in this decision-making process?"; "Does theory play a role in urban design?"; and, "What cues help to shape a better understanding of the environment in which we live?". Conclusions will be drawn about the nature of the design review process itself, in addition to the key areas that seem to be influencing its application as a planning tool. From these conclusions, a basic assessment model will be developed and critically evaluated with respect to the requirements of the larger planning process. Furthermore, a scoring procedure will be developed to demonstrate the applicability of the assessment model to real-world design review situations, while at the same time, providing a mechanism by which the robustness and practicality of the model can be tested for the future.

1.5 The rationale

This thesis can be shown to respond to three of the pressing concerns which have been expressed from practitioners and academics in the field by an examination of the following three points. First, the lack of a coordinating mechanism that aids in the evaluation of design proposals makes this evaluation process inconsistent and unreliable (Ndubisi et al., 1984). Design review often slips into a subjective argument based on aesthetic judgement and taste. Consequently, many of the decisions regarding the appropriateness of a proposal rests solely on the physical components of the design and does not consider the wider implications of the proposal for the living environment in which it is located. It has been demonstrated that this type of review often contributes to the acceptance of impersonal design solutions which are not sensitive to the needs of the community and their respective user populations (Hester, 1987; Seidel, 1981; Sneddon & Theobold, 1986; Sommer, 1974).

Second, Cats-Baril and Gibson (1986) have demonstrated in a survey of professionals working in fields related to urban design that the development of a "dynamic, systematic, reliable, valid, and implementable methodology" which recognizes social and cultural values as well as the potential for participation at all levels through education was the first priority for research in the field (p. 95). Effectively, this means that research should be directed at developing an approach to urban design review which is effective for evaluating the physical, aesthetic, and social implications of development proposals in larger participatory contexts (Owen, 1987). This thesis works to extend the urban design field in this key area.

Finally, current design review procedures do not accurately reflect the goals of stated planning strategies. This is because planning goals often have little meaning with respect to the formation of the physical environment. Similarly, these goals are often inefficiently translated or applied for the purposes of design review. It is significant that this thesis develops an assessment model that relates planning objectives to other important assessment criteria. This integration gives the process of design review greater credibility and facilitates an assessment process which better represents the overall needs of the community.

1.6 The nature of urban design theory and research

Before proceeding, it is necessary to provide a general overview of the structure of urban design research and of the relationship between the various fields which contribute to it. It has generally been recognized that there is very little pure urban design theory (Lynch, 1984). Most of the influential concepts and ideas have been extended to urban design from other areas. It is possible, however, to make several key organizational distinctions. First, a distinction can be drawn between purely theoretical or academic approaches to urban design research and a growing body of urban design *praxis*. Much of that which comprises the state of the art in urban design knowledge is contained in this large body of reports, professional articles, plans, and competition submissions. In addition, a considerable amount of information is present in published case studies. This distinction is very important since it serves to underline the critical discrepancies which exist between what urban designers say and that which they have actually accomplished within the regulatory planning environment.

Second, there can be other distinctions made with respect to the fundamental meanings of the term "theory" itself. The first reflects the view that theory can be used to formulate an hypothesis that a certain outcome will be derived from a certain action. In this light, the practice of urban design could be seen to be built upon a coherent set of general propositions which can be used to explain a particular occurrence or series of events. This type of theory is termed *positive* (or descriptive) theory because it consists of a series of positive statements or assertions about reality (Bolan, 1983; Faludi, 1978; Lang, 1987; 1988).[6] While it is true that designers do formulate positive theories about the environment – either consciously or unconsciously – it is also evident that designers have not been quick to articulate and systematically test these basic assumptions. In contrast, much of the knowledge that planners have utilized to undertake the development of the urban landscape rests upon implicit assumptions which have grown in one way or another out of personal observations and experience or from formal design principles taught in school (Lang, 1987; Norberg-Schulz, 1965; Proshansky, 1974). These guidelines and design principles collectively presuppose

well-developed ideological positions that specify what the environment, the city, and urban design "ought to be" (Bolan, 1983, p. 4). In other words, they reflect the established *normative* theoretical position of the designer. Herein lies the fundamental difference between positive and normative theory – positive theory attempts to describe, explain, and predict the world's phenomena reserving judgement about the virtue of the change, while normative theory represents a call to action. "In the end, normative theories do not make predictions about the future – they make prescriptions about how people ought to act. Predictions are only implicit – if we act properly we will have happier, more fulfilling lives or a better community, etc" (Bolan, 1983, p. 4).

It has been suggested by a number of researchers that the field of urban design is weakened considerably by the absence of a consistent positive theory (Gold, 1987; Lang, 1987; 1988; Ndubisi et al., 1984). This conclusion is based on the role which positive theories of urban design can play in informing practice. As in other fields of study, it can be used to organize thoughts and structure explorations of key design problems. In addition, positive theory can help the planner identify areas of concern and weaknesses in a given situation through directed inquiry and by substantiating or disproving key assumptions. Contrasting this position, other researchers have suggested that all of urban planning – including urban design – should work towards the development of more stable and fundamentally valid normative theoretical positions (see for example, Bolan, 1983; Jacobs & Appleyard, 1987; Klosterman, 1978; Lynch, 1984). This is because normative theory develops generalizable connections between the physical form of the environment and important or necessary human, social, and cultural values (Lynch, 1984, p. 37-50). The position taken here is that both types of theory deserve equal emphasis since some form of positive theory clearly informs and supports any normative theoretical position. In other terms, normative theory provides designers with a rationale for action while positive theory can be seen as a mechanism for substantiating and testing that which is known.

This leads to another key distinction between procedural and substantive theory (Faludi,

1978, p. 162). *Procedural* theory places an emphasis on the knowledge which is necessary for solving a given problem. It is concerned with the process of planning as an activity and consequently explores the analytical, evaluative, procedural, and decision-making processes of urban design. In contrast, *substantive* theory concentrates on the nature of the urban design field – the natural and built environments and their relationship to the human world. Bolan (1983) has restated the distinction between procedural and substantive theory in the following way: "It concerns, broadly speaking, theory about the objects being planned (cities, industrial empires, construction projects, military campaigns, etc.) versus theory about the human subjects engaged in planning" (p. 3).

Together with the distinction of positive from normative theory, it is possible to develop a four-fold classification of urban design theory as in Figure 1.2. From this figure, several observations can be made. First, it underlines the inter-relationship of the various theoretical perspectives informing modern urban design practice. It also contrasts those fields which have been traditionally considered as design theory with some of the key emerging areas of interest such as the behavioural sciences and ecology. Third, it highlights the strong

Figure 1.2 - The structure of urban design theory. Shaded cells denote those areas which have traditionally been promoted as urban design theory.

	Orientation	
Subject	Positive/Descriptive Theory (Facts)	Normative Theory (Values)
Substantive (Material World)	•urban growth models •ecology/urban environmentalism •cognitive-behavioural sciences	• the good city/the good society •meaning and symbolism •utopian ideology •aesthetics and urban form
Procedural (Conceptual World/ Relational World)	•design as decision-making process •design as product •design strategy and technique •design as dialogue	•theories of effective planning •social design

relationship which exists between normative and procedural theory in the urban design field. This is significant because it demonstrates that urban design thinking is often bound and inseparable from particular normative positions. As a result it is not possible to make a clear distinction between positive and normative urban design theory for most purposes. Figure 1.2 does show, however, that it is possible to differentiate substantive and procedural notions along thematic lines. This creates a workable structure from which it is possible to undertake a review of the major research areas which contribute to the body of urban design theory.

1.7 Methodology

The research for this thesis was conducted in three phases. In order to develop an understanding of the theory of urban design, the first research phase consisted of an extensive literature review. This inquiry was directed at the findings of those fields which could be seen to be shaping the current understanding of urban design theory. As such, the relevant literature on design and architecture, environmental psychology, behavioral geography, participatory design, and urban ecology all played key roles. As a part of this review process a distinction was made between the substantive design notions and the actual techniques, decision making strategies, and processes of design intervention which have been proposed by various urban designers.

The second research phase consisted of an analysis of the contemporary design review process in several North American cities. While this phase also consisted primarily of a literature review, considerable effort was made to attain a significant number of primary research sources from municipal and regional governments.[7] The objective of this phase was to uncover a basic understanding of the contemporary design review process and to identify its strengths and weaknesses.

The final research phase consisted of a synthesis of the research findings and the development of the project assessment model. To complement the basic findings, alternative sources which reflected new decision making approaches, innovative planning strategies,

and organizational models were explored at this stage where necessary.

1.7 Structure of the thesis

The remainder of the thesis has been divided into four parts. Part Two presents a synthesis of the substantive theory of urban design planning. It is meant to develop a referential definition of what urban design has become and to identify the source of some of the critical design ideas which shape it. These findings are employed in the final section to develop the specific parameters of the design review model. Chapter Two concentrates on the meaning of urban environments and the integral role that design can play in strengthening these symbolic qualities. Chapter Three elaborates on the contributions of architectural and design theory. It details the significant utopian visions and critical normative approaches to urban design that planners have tended to emphasize throughout history. Chapter Four approaches urban design from a behavioural perspective and emphasizes the impact of the built environment on human cognition, perception, and behaviour. Finally, Chapter Five investigates the influence of the ecological perspective on the nature of urban design thinking.

Part Three explores the body of procedural urban design theory. In Chapter Six, the process of designing is viewed as the key object of analysis. By concentrating on the participatory nature of the contemporary design process as well as the decision making strategies and informational requirements that are employed by designers, it is intended that this chapter will strengthen the basis of the proposed assessment model.

Part Four is focused on contemporary urban design praxis. Chapter Seven concentrates on the specific design review practices that have been implemented in several North American cities. Specific attention is given to the structure of the review process, the formulation of design goals, the effectiveness of design regulation, and the discrepancies which exist between theoretical and practical urban design models.

In Part Five, the findings of the previous chapters are combined to develop an alternative assessment model for urban design review. Chapter Eight explains the rationale for its

construction and details its structure, main components, and the related analytical techniques that would complement its implementation. The final chapter examines the strengths and weaknesses of the proposed urban design review model. It analyzes the conflicts which must be overcome in order to implement this new approach and attempts to set the stage for its further development. In conclusion, it is expected that recommendations can be made for structuring an integrated approach to design review using this model as a basis.

Notes

[1] Amos Rapoport (1977, 1982) is one commentator who believes that the *design of the city* is the end product in a cumulative process of individual actions based on a personal understanding and interpretation of the meaning of the environment. The fact that one chooses to "design" does not negate the fact that "design" may already have been occurring as a collective action in society. Similarly, Hillier and Hanson (1984) have shown that it is an intimate understanding of the spatial nature of society by its members which causes physical environments to develop. Hence, it is likely that they would argue the point that urban design has always existed intuitively, beginning with the development of the first small settlements and towns. I do not disagree with the central point of either of these arguments. Clearly, they represent a fundamental point which is central to any discourse on urban design. However, while my categorization may not be chronologically accurate or complete in these terms, I am more interested here with the practice of urban design as a part of the larger processes of city planning. Hence, the point at which individuals actively entered into the practice of urban design is significant as a starting point for the discussion.

[2] Exactly when the terms *urban* or *city planning* were used for the first time is not known. Although Collins and Collins (1986) dismiss it as a semantic inefficiency of the translation from German to English (p. 28), it is interesting to note that the literal translation of Sitte's Der Stätbau nach seinen künstlerischen Grundsätzen (1886) is "*City Building* According to Artistic Principles". This reflects a common traditional phraseology which can be found in many texts from several different countries (see for example, Geddes, 1915/1968; Lanchester, 1925; Unwin, 1909/1971). While it cannot be substantiated, I believe that the term "city building" was more appropriate to the task and mind set which these individuals had developed and reflects the view that planning was not differentiated from the associated activities of architecture and landscape design.

[3] This statement holds true at least for urban design planning at the municipal or metropolitan level. It should be noted, however, that several jurisdictions have taken a more pro-active design approach to planning efforts in recent years rendering this statement less accurate.

[4] For the purposes of this thesis, the terms "development proposal" and "design proposal" will

be used interchangeably to refer to any form of evidence or documentation which describes the parameters, appearance, and/or implications of a potential development project for a given site regardless of its degree of accuracy or finality. Hence, a preliminary design concept, a completed design scheme, and a finalized development project application all will be considered as design proposals. This approach has been adopted because it recognizes that there is an underlying connectivity in the design process over time. Furthermore, it recognizes that the substance of any proposal for *development* is dependent to a large degree on the shape it takes as a finalized *design.*

[5]The original intent of this thesis through the proposal and research phases was to develop an automated simulation of a project assessment model which integrated a number of complementary computer technologies. It was hoped that this type of system could aid in the design review process by improving visualization abilities, reducing the time required for the processing of development applications, and introducing a number of well-developed analytical procedures such as "what-if analyses" and "pathway visualization". However, over the course of these preliminary phases it became evident that there had been little attention directed at the development of assessment models in general. Similarly, there was little overall development of the inter-connectedness of the various areas of urban design knowledge which planners have commonly referred to when analyzing a project during the design review process. The absence of these types of assessment models for urban design review served to substantially alter the focus of the thesis to its present form. Still, the original intent of the thesis remains in tact as the final chapter expands on the potential for this type of system and lays some of the ground work for making the transition from this "manual" assessment model to a more "interactive" system.

[6]This is not to be confused with the positivist paradigm which posits that no truth exists which is beyond the bounds of verification and falsification, usually by testing through the scientific method.

[7]Since the early 1980s many authors have taken considerable time to document the ongoing activities of design review authorities in cities like New York, San Francisco, and Vancouver. While these findings were relied upon heavily, considerable effort was maintained to ensure the accuracy of these findings. Where this could not be done, information will be designated and acknowledged to its original source as identified in the references.

PART II

The Notion

By definition, any examination of substantive theory should deal with the real or essential nature of some activity. In terms of urban design, this distinction implies a concern for the form, structure, visual impact, and aesthetic qualities of the urban environment. It also anticipates an appreciation of the natural physical environments within which urban places are located as well as the social and psychological impacts of cities on their inhabitants. Finally, it is indicative of the full range of conceptual models – both real and imaginary – that describe what the city might or should become through design and planning. Effectively, substantive urban design theory can be viewed as that part of design thinking which deals with the person-environment *interface* (Gold, 1980; Lang, 1987; Proshansky, 1974; Rapoport, 1982). It is concerned with the full range of ideas and philosophies informing urban design; with facts and opinion; with its heart and soul. Thematically, substantive urban design theory can be broken down into four general areas of interest – symbolism and meaning of the urban environment; aesthetics, architecture, and design theory; urban ecology and environmentalism; and the contribution of the behavioural sciences. Each of these areas will be addressed in considerable detail in the following chapters.

CHAPTER TWO

SYMBOLISM AND URBAN DESIGN

"It is the idea of the street, not the reality that is important."

– A.P.Smithson, 1970

As a reaction to the poor working and living conditions of the industrial cities of the 19th century, the Modern Movement in urban design and planning has influenced the development of urban areas to a degree which was unknown in the past. While it is certain that the development controls, zoning by-laws, and functionalist design schemes of this period can be viewed positively as they have worked to eliminate many problems associated with city living, it cannot be said that these advances have been made without any costs. In place of elaborating on the shortcomings of these "modern" cities, it is sufficient to state that their cumulative effect has been to weaken and change that aspect of urban places which has been an enduring factor since urbanization began – the *idea* of the city.

This problem has served as the point of departure for many explorations of the meaningfulness of city environments in the fields of anthropology, architecture, urban planning, geography, psychology, and sociology. Given this diversity of interests, it is interesting to note that the findings of these research initiatives can be aggregated into a coherent framework of investigation which emphasizes common themes. Some of the important questions that have been addressed in these studies can be summarized as follows: "How does the physical form of cities reflect meaning and symbolism which is inherent *or* intended in their design?"; "What helps an urban place to be meaningful?"; "How are urban symbolisms expressed and adapted over time and between cultures?"; and, "What can designers do to improve the viability and meaningfulness of city environments?". The

answers which have been provided to these questions are of considerable importance to the practice of urban design. They point to the essential characteristics of the built environment and underline the critical connection between the design process and the urban form.

The purpose of this chapter is to explore some of the fundamental theoretical positions that have been defended in the areas of urban meaningfulness and symbolism. The concluding section synthesizes these findings and compares them with other relevant works in the field. It is intended that this approach will highlight important themes that have implications for city planning and an emerging framework of urban design review.

2.1 Theories of urban symbolism and meaning

The objective of this section is to evaluate the key theoretical positions that been advanced to explain the relationship between the physical form of the city, its internal symbolisms and meaning, and their significance for urban design.

2.1.1 Jung: Archetypal meaning and the collective unconscious[1]

The foundation of the Jungian approach to urban symbolism is an elaboration of his definition of the archetype –

> "What we properly call instincts are physiological urges, and are perceived by the senses. But at the same time, they also manifest themselves in fantasies and often reveal their presence only by symbolic images. These manifestations are what I call the archetypes. They are without origin: and they reproduce themselves anytime or in any part of the world" (Jung, 1964, p.58).

Central to his thinking (as *archaic remnants* were for Freud before him) these archetypes represent psychic elements surviving in the human mind; historical associations linking the rational and conscious world with the world of instinct. Jung theorized that man has evolved this "basic psyche" out of the biological, prehistoric, and unconscious development of the mind. This basic psyche – which he termed the "collective unconscious" (1964, p. 57) – is made up of symbolic associations which lie beyond the grasp of reason and penetrate to the

central meanings of the existence of man in society.

Within this basic framework, Jung states the central problem which faces today's society in this way:

> "Modern man does not understand how much his 'rationalism' (which has destroyed his capacity to respond to numinous symbols and ideas) has put him at the mercy of the psychic 'underworld'. He has lost his spiritual values to a positively dangerous degree. His moral and spiritual tradition has disintegrated and he is now paying the price for this breakup in world-wide disorientation and dissociation" (Jung, 1964, p. 84).

The challenge is to realize and act on the imagery and symbolic content of dreams in order to establish an internal psychological equilibrium. The resolution of this dialectical tension between the conscious and unconscious mind is viewed by Jung as the central activity of human life. It is this activity which is meaningful and brings individuals to a sense of purpose as well as to symbolic and spiritual growth (von Franz, 1964).

As the agents of this growth process, the symbolic representation of archetypal themes takes on even greater significance with the distinction of a *sign* from a *symbol.* A sign is a mere representation of some object or event, while a symbol stands for something which is beyond its obvious and inherent meaning (Jung, 1964, p.41). Archetypal symbols, on the other hand, have their own initiative and specific energy as a reflection of the struggle between the conscious and unconscious mind. They have a mysterious quality which points to the unknown. The specific form or structure of the symbol, therefore, is rendered less significant than the meaningful interpretation of the wider message. This is not the case for the sign as it has been defined. Moreover, an individual is only able to respond to these themes because they hold for them something which is beyond their immediate consciousness; a message of a fundamental and symbolic importance (Henderson, 1964). For this reason, it is important to note that while the specific expressions of these archaic patterns change to fit different contexts that their larger meaning evolves slowly as a reflection of the developing

collective unconscious in society.

It is not, therefore, possible to set out and consciously create symbolic meaning in anything – that is, to design or build a symbol. Jung writes, "No matter what fantastic trapping one may put upon an idea of this kind, it will remain a sign, linked to the conscious thought behind it, not a symbol that hints at something not yet known" (1964, p. 41). In this light, it is possible to differentiate two types of symbol. *Natural symbols* are developed out of the content of the archetypal images of the psyche, while *cultural symbols* are collective representations of primeval dreams and fantasies (Jung, 1964, p. 42). The significance of this distinction is made more evident in the following way. A natural symbol for perfection, for example, can be expressed in many forms – a circle or the colour white, perhaps. The realization of its meaning is unrelated to and independent from its particular expression. On the other hand, a cultural symbol of the union of heaven and earth such as a church has come to be more or less dependant on the specific characteristics of a particular culturally determined definition. Hence, the cultural symbol seemingly begins to lose its connection with the unknown (that is, its meaning) upon its expression as a knowable and recognizable form. It returns in character to the nature of a sign and comes to serve a conservative purpose – namely, the preservation of a previously existing order.

This contradiction in terms is resolved in the following way:

> "[The Church] also serves the creative purpose of giving expression and form to something that does not yet exist, something new and unique...What restores the old order simultaneously involves some element of new creation. In the new order, the older pattern returns on a higher level. The process is that of the ascending spiral, which grows upward while simultaneously returning again and again to the same point" (von Franz, 1964, p. 247-248).

The various expressions of what constitutes a church within the general cultural definition, forces an individual to continually re-examine and re-interpret the archetypal images of heaven and earth. This activity perpetuates the church as a symbol and assures its significance

as a viable expression of archetypal meaning in society.

2.1.2 Rykwert: The idea of the town

The conclusion reached by Joseph Rykwert (1988) in his morphological analysis of ancient cities is that today's society lacks a synthesizing concept similar to that which was played by the symbolic inter-connection of the physical environment, myth, and religion in the past. Rykwert contends that cities in these ancient societies had a higher personal level of meaning which facilitated a clearer definition of one's place in the universe and his or her attachment to the surrounding environment (1988, p. 188-189). This union of man and environment was reinforced by ritual practices and festivals.

To demonstrate this point, Rykwert investigated the widespread utilization of orthogonal planning as a technique for the laying out of cities and towns. He writes,

> "Orthogonal planning is not, after all, a techniques which may become isolated from its social religious content to percolate through trade exchanges. It is hardly analogous to the adaptation of a tight discipline and its adoption by a people...was not in the least likely to have occurred as a simple matter of convenience. The orthogonal plan and the matter of orientation was too important in the life of a people to have been taken over arbitrarily as one good idea among others. It must in fact have had a context in the general world picture of the Etruscans [and other societies] into which it might fit, or else have modified that world picture in such a way as to leave definite traces of the upheaval" (Rykwert, 1988, p.86).

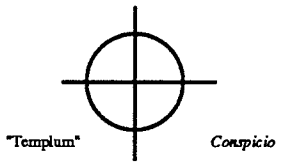
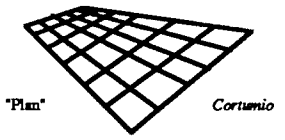
Clearly, the latter has not happened.

Rykwert believes that orthogonal planning is only *one* technique which is representative of the ancient practice of unifying the fundamental "world view" of society with its culture, customs, and the form of its environment. Rykwert detailed the Etruscan rite of "*inauguratio*" to defend this position (1988, p. 44). This complex ritual that was used for founding new townsites consisted of prayers in addition to the naming and interpretation of signs. The ritual actions of the *inauguratio* were culminated in three parts – *conregio*, *conspicio*, and

cortumio. For the conregio, the *augur* (equivalent to a prophet or soothsayer) drew a diagram corresponding to the cardinal directions on the ground in order to fix the regions of heaven and earth which were in view before him. In the conspicio, the augur's eyes imitated the actions of the first step in order to unite the four different *templa* which had been created into a single *templum* by sight and gesture. Finally, the augur specified which natural signs he wished to see and interpreted their symbolic implications for the chosen site in the *cortumio* (Rykwert, 1988, p. 45).

As can be seen from Figure 2.1, "...the three procedures [*conregio*, *conspicio*, and *cortumio*] were three modalities of the same ordering of space" (Rykwert, 1988, p. 90). They recall the divine 'instituting' of a center of the world, the augur dividing the town into four

Figure 2.1 - Three levels of symbolic meaning in the *Inauguratio*.

Level of Meaning	**Interpretation**	**Representative Sign**
Symbolic	Divine "instituting" of the center of the world	
Religious	Augur uniting "spiritual" quarters with the physical world	
Temporal	"Parcelling out" of the orthogonal survey	

'spiritual' quarters by the *cardo* and *decumanus*, and the act of 'parcelling out' the town site by the orthogonal survey. The given place in which it has been carried out is transported from the ordinary to an archetypal ordering and conception of the universe in a single ceremonial action. This is also shown in figure 2.1 by the visible representations or signs that correspond to each of the three levels of meaning that are developed in the *inauguratio*. As it has been

presented here, the strength of this conception can (in the Christian world at least) be seen to result in a progression from the Greek sign ,  , representing Christ to the orthogonal survey map or street layout.[2]

Parallel cosmologies which have been used in similar ways are common throughout the ancient and modern world. This has been Rykwert's contribution – to demonstrate the power that these powerful notions have for creating unified and meaningful spatial environments within a given society. Rykwert elaborates,

> "However, frail your structure, the act of choosing a site for [the city] of setting it up is different from the animal's choice of nest or lair. A man knows that he is doing it, the animal does not. Therefore, the setting up of it, and the choosing must also contain the act of explaining the action to the actor, and also – since its is in some way an action against nature – of justifying it" (1988, p. 174).

This is the role played by these symbols and the celebrations and festivals which recall their presence. They re-affirm the presence of man in the face of great uncertainty.

2.1.3 Norberg-Schulz: Genius loci and creative participation

For Christian Norberg-Schulz, there do not exist different kinds of architecture but only different situations which require different solutions in order to satisfy man's physical and spiritual needs. This realization makes it possible to distinguish between the 'style' and the 'content' of particular design solutions. That is, different stylistic representations only become deep and meaningful (i.e. they contain content) when they represent the quality or spirit of a place; its *genius loci* (Norberg-Schulz, 1980, p.10-11). A space's 'content' is an integral part of its existence – a total qualitative phenomenon, having shape, substance, texture, and colour – which is realized as the sense of environmental character that transforms the space into a place. Norberg-Schulz describes the basic properties of these man-made places as concentration and enclosure. In his own words, "...they are 'insides' in a full sense, which means that they 'gather' what is known" (1980, p. 10). Only in the gathering of the

properties of a place is it possible to concretize the genius loci, bringing its meaning closer to an interpretation by man.

This is the essence of Norberg-Schulz' concept of "creative participation" (1980, p. 185). By understanding and respecting the genius loci and the structural properties of the space which make it possible, man is able to adapt the *spirit of the place* into new and changing historical circumstances. This is the existential purpose of building – to uncover the meanings potentially present in the given environment and to take them beyond the specific circumstances in which they are realized. Creative participation represents a symbolization of the genius loci in order to "...constitute man's existential foothold, his *culture*" (Norberg-Schulz, 1980, p. 185). By understanding his place, man is able to participate and contribute meaningfully to its history.

The problem, in these terms, is that today's city environments do not possess the enclosure and density of the past indicating a loss of place. Norberg-Schulz writes,

> "Lost is the settlement as a place in nature, lost are the urban foci as places for common living, lost is the building as a meaningful sub-place where man may simultaneously experience individuality and belonging. Lost is also the relationship to earth and sky" (1980, p. 190).

These environmental conditions present several challenges which imply a crisis of human identity. For Norberg-Schulz, these challenges must be met with a careful and considerate understanding of man's own needs and the places in which he lives.

2.1.4 Rossi: Typology and urban memory

There are two basic ways to study the city according to Aldo Rossi. The first views the city as a product of the generative processes of urban development and in the second the city is seen as an identifiable spatial structure. The former – the traditional research focus of economics, sociology, and political studies – has not been successful in his view since it has tended to reduce the *raison d'être* of the city and its architecture to a series of functional

classifications (Rossi, 1982, p. 46). The form and structure of the city is subordinated to its function and is therefore rendered meaningless. In contrast, Rossi believes that by studying the city as a spatial entity through its architecture, it is possible to move beyond these functional classifications to see the city as the ultimate act of humanity – "...the creation of the environment in which it lives" (1982, p. 21). This way the life of the city becomes evident in the form of its buildings and the shape of its streets. Rossi writes, "The urban image, its architecture, pervades all of these problems and invests all of man's inhabited and constructed realm with value. It arises inevitably because it is so deeply routed in the human condition" (1982, p. 27).

Central to this position is Rossi's consideration of "type" as the essence of architecture (1982, p. 41). Just as the city is the object of analysis, typology becomes the method. The classification and definition of specific architectural types subsumes, and at the same time, penetrates to the quality and uniqueness of buildings as urban artefacts. In other words, "type is something permanent and complex, a logical principle that is prior to form and constitutes it...The problem is to discern the modalities within which it operates, and moreover its effective value" (Rossi, 1982, p. 41). Far from being an elaboration of a specific structural arrangement of buildings in the city, an understanding of typology is much more general in its intention. It specifies only a series of relationships within which it was (or is) possible to create a specific meaningful form.

The city, therefore, is meaningful at two levels. The first as a unified man-made object and the second as a collection of urban artefacts which have their own particular history and form. Both of these levels represent and reflect a larger spatial relationship through their typology. Rossi employs this conceptualization to create a dynamic tension between this ideal typological form and the specific circumstances of a particular site. It is this interplay between the ideal and the particular which structures the urban environment and unifies it as a meaningful collective act of construction.

Rossi's (1982) analysis can be seen to proceed at another level –

> "For Rossi, the city is a theatre of human events. This theatre is no longer just a presentation; it is a reality. It absorbs events and feelings, and every new event contains within it a *memory of the past and a potential memory for the future*. Thus, while the locus is a site which can accommodate a series of events, it also is a unique or characteristic place, a 'locus solus'...The new time of architecture is thus of *memory* which replaces history. The individual artefact for the first time is understood within the psychological construct of collective memory" (Eisenman, 1982, p. 7; emphasis added).

The significance of this observation can be demonstrated by a discussion of Rossi's concepts of "permanence" and "primary elements" (1982, p. 60).

To talk of the permanence of some thing is to mention its capacity to continually represent the city; its history and art; its being; and, its memory. Primary elements, on the other hand, are those things which consciously or unconsciously develop in the urban environment a series of "rules" or ordering relationships that give it a certain structure. For example, a series of monuments or a development plan can be considered to be primary elements. It is from the permanence of primary elements that it is possible to interpret the city as something that is not only substantiated in a particular form and space, but as something which is understood in time. The city becomes a synthesis of form and value at a particular point in history.

2.1.5 Hillier and Hanson: The social logic of space

Hillier and Hanson (1984) make a clear distinction between the two dimensions of logic which can be seen in the design of any artefact. The first is the achievement of functional objectives which point to the artefact's practical use. The second is the articulation of its dimension of style, thereby identifying the object and assigning its own *meaningful* purpose through that identification. This distinction is further extended to the concept of buildings and architecture. Hillier and Hanson (1984) explain,

> "Buildings may be comparable to other artefacts in that they assemble into a physical object with a certain form; but they are incomparable in that they also create and order the volumes of space resulting from that object into a pattern.

> It is the ordering of space that is the purpose of building, not the physical object itself" (1984, p.1).

Architecture is important *not* because of the symbolic value which is contained in it, but rather because it creates and orders space allowing us to recognize and affirm the existence of society.

In order to more fully realize the implications of this position, Hillier and Hanson challenge us to reject the mutually reinforcing notions that the physical environment has little social content and that society has little or no spatial content. This is significant since it removes a paradoxical relationship which has been a barrier to the reconciliation of the physical and social worlds – "...that of finding a relation between abstract immaterial 'subjects' and a material world of 'objects'" (Hillier and Hanson, 1984, p. 9). In contrast, the authors theorize that society is spatial in at least two ways. First, society arranges people in relation to others by processes of aggregation and separation. Second, it arranges itself by means of markers, identifiable zones, and districts. From both of these spatial processes, it becomes possible to discern a recognizable social structure. It follows, therefore, that different types of social formations would require different spatial arrangements in order to sustain themselves, and vice versa.

Hillier and Hanson (1984) write,

> "The most striking property of a society is that although it may occupy a continuous territory, it cannot be regarded as a spatially continuous system. On the contrary, it is a system composed of large numbers of discrete entities called individuals. We do not have available in rational thought the concept of a system of autonomous, freely mobile, spatially discrete individuals...Society, it appears, if it is a system at all, is in some sense a discontinuous or discrete system, transcending space" (p. 32).

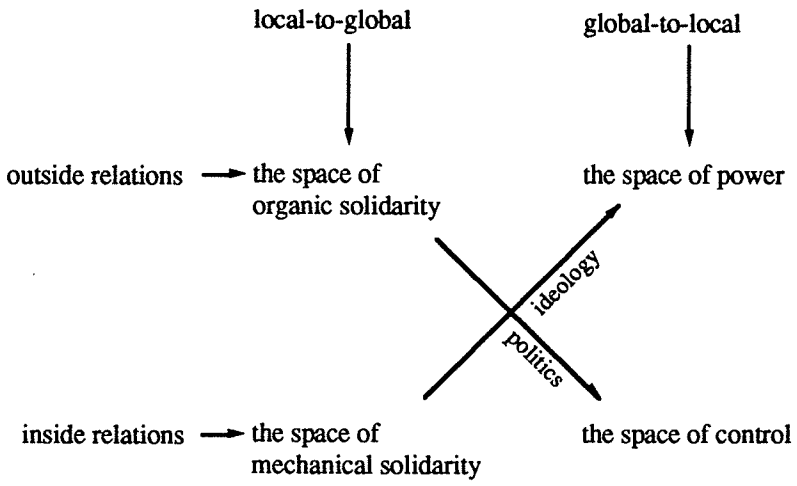
It is this hypothesis which forms the platform upon which they have developed their "re-spatialized" theory of society.

The "transpatial" nature of society is clearly demonstrated by using the concepts of *genotype* and *phenotype* (p. 34). The phenotype, in this instance, is any particular discrete spatio-temporal form such as a building or a settlement. The genotype, in contrast, is the transpatial relationship between the various phenotypical arrangements – relating rooms to the building or buildings to the town. This analogy is a literal extension of the biological application of these terms. On this point Hillier and Hanson elaborate that, "The consistency in human activity at the social level is not the product of the biological genotype but of an artefactual genotype: one that is retrieved from reality itself which has already been constructed by the activity of man" (p. 44). Hence, the transpatial nature of society seems to operate on an "inverted genotype" where the structured information on which the system is built is carried in the reality of the spatio-temporal world. This is a very interesting position since it leads to the realization that the global object (i.e. the form of a town) results from a local rule (i.e. the required arrangement of buildings according to the needs of society), and similarly, that the local object (i.e. the building itself) is determined by a global rule (i.e. the relationship between interior and exterior spaces resulting in the form of the town). Furthermore, each of these objects has a describable form.

Hillier and Hanson elaborate on this point by developing the concept of a morphic language. A morphic language is "...any set of entities that are ordered into different arrangements by a syntax so as to constitute social knowables" (1984, p. 48). This definition serves two purposes. First, it reduces the potential number of spatio-temporal arrangements to a series of principles describing the social relationships which are acceptable and known to a given society. Second, these principles are given a structure or syntax which permits these various spatio-temporal arrangements to exhibit systematic similarities and differences. In these terms, a class of objects (i.e. a transpatial integration) is an unarranged set, while an arrangement of these objects creates a new relational identity from which it is possible to interpret new patterns. This structure allows the syntax model to avoid the deterministic notion that there is a relationship between the environment and social behaviour

by highlighting the real relationship between the *transpatial generators* of settlement form and the operating societal forces. The significant point is that Hillier and Hanson have shown that it is useful to distinguish between the morphological or arrangemental principles of a society and the actual social and spatial mechanisms by which they are realized (p. 253). This allows for comparison of the dynamic principles behind particular structures as opposed to the structures themselves. This is shown in Figure 2.2.

Figure 2.2 - Social solidarity and its relationship to space.



Source: Hillier and Hanson (1984, p. 22).

This figure summarizes how space comes to be viewed as a function of the forms of social solidarity in society. A society which exhibits a strong *global-to-local* ordering will be structured by a system in which the major public buildings play a considerable role and are actively represented in ceremonial activities. Conversely, where there is a strong *local-to-global* ordering one would expect a freer definition of forms with the dispersion of the significant buildings throughout the city resulting in a less structured urban environment. These findings are supported by real world examples in many cultures. This fact points to the efficacy of analyzing the urban environment as a reflection of socially determined transpatial relations.

2.1.6 Alexander: A pattern language

Christopher Alexander (1979) makes the central hypothesis that there exists "one timeless way of building" which has formed the core of all acts of construction for thousands of years. He works to elaborate this timeless way by developing an extensive generative model consisting of *patterns* – spatial relationships between the physical environment and the processes of human life. This model he calls a "pattern language" (Alexander, et al., 1977: 1979). Structurally, the patten language is ordered from the largest (i.e. a pattern for regions) to the smallest (i.e. a pattern for construction detail) patterns. As a result, the language progresses in a straight linear sequence with the more detailed patterns nested inside the more general patterns of relationships. Each pattern functions as "...a rule which describes what you have to do to generate the entity which it defines" (Alexander, 1979, p. 182). Mathematically, Alexander has attempted to define a set of basic physical elements with a set of rules for combining these symbols in a recognizable syntax structure. This is the essence of the pattern language – it specifies a series of meaningful relationships within which endless variety can be generated (Alexander, 1979, p. 183).

This language-based design model attempts to respond to the critical problem facing designers, planners, and the general public. Alexander, et al. (1977) explain,

> "...the languages which people have today are so brutal, and so fragmented, that most people no longer have any language to speak of at all – and what they do have is not based on human, or natural considerations" (p. xvi).

They believe that this inability to interpret and communicate the inherent patterns of relationships in the built form has destroyed the essential quality of the environment which is meaningful to us. Alexander continues,

> "All things and people and places which have this quality without a name, reach into the relay of the eternal. Some are eternal in almost a literal sense: they are so strong, so balanced, so strongly maintaining, that they are not easily disturbed, almost imperishable" (1979, p. 37).

An examination of the various patterns in the language illustrates the depth in understanding which is required to operate within it. Alexander and his colleagues have tried to articulate specific morphological relationships which could be employed to develop more meaningful and responsive environments. In fact, they believe that at least part of the language which they have presented is the archetypal core of all possible pattern languages (1977, p. xvii).

Viewed from this perspective, the language itself is intended to represent the *basic thematic content* of man's relationship to his environment which is common to all peoples. This condition is only met with the important proviso that individual and/or cultural biases will alter the significance of each pattern in order to reflect its true impact at the cultural level. Moreover, while it is these specific personal or cultural languages which are the significant generators of form, it is the commonality between them which allows for their comparison and interpretation at all levels. It is this factor which supports the language analogy and gives this conception its strength.

2.1.7 McMillan: The inherent meaning of structure

Ronald McMillan (1979) arrives at the conclusion that the concept of architecture is solely dependent on structure in his analysis of structural forms and techniques. He elaborates on this point by describing the three primary characteristics of any man-made structure.[3] The first is that of its functional use as a mechanism of construction. Second, structure provides stability and resistance to the elements thus giving an object a degree of permanence. Finally, as implied by the first two characteristics, architectural structure allows for the communication of complex meanings and relationships through its form. It is this final characteristic which stands as the foundation of McMillan's central argument that it is necessary to strive for more universally acceptable and meaningful forms of expression (1979, p. 24).

Good design, therefore, should penetrate to the heart of the problem and by defining appropriate structural associations, illuminate both the conflict and its resolution in the

particular architectural solution. McMillan believes that this approach is central to an understanding of context and is therefore critical in the development of meaningful environments. He also contends that while architects and designers have been able to understand these structural relations reasonably well that a more complete appreciation of time has been neglected (p. 36). The challenge is to resolve the demands of the seemingly unchanged existing environment in an evolving new one. This observation leads to the realization that any architectural solution is only one potential response at a given point in the history of the development of a city. As such its influence on the environment is only partial. McMillan proposes that a new architecture should be developed as a dynamic synthesis of time and space. It is this evolving fourth dimensional complex which should work to unite the environment into a meaningful synthesis of space and history.

2.1.8 Lynch: Good city form

Kevin Lynch's seminal work, The Image of the City (1960), took as its point of departure an individual's ability to reference a coherent and recognizable mental picture or image of the environment. His two concepts of *imageability* and *legibility* are of central importance in this regard. Imageability is that quality in a physical object which gives it a high probability of evoking a response in any given observer, while legibility is the ease with which the physical elements of a city could be organized into a recognizable mental pattern (Lynch, 1960, p. 2-9). His argument is that a well-formed image of the city with its specific identity and structure is meaningful to city residents and is employed by them to understand and orientate themselves in the environment. Lynch explains the importance of this point – "If an environment has a strong visible framework and highly characteristic parts, then exploration of new sectors is both easier and more inviting" (1960, p. 110).

This same attitude carried over into the development of his theory of "good city form" (Lynch, 1984). Making reference to what he interpreted as a common feeling of dissatisfaction with urban places, Lynch sought to develop a workable model of city form within which

it would be possible to articulate weaknesses and to identify alternative courses of action. The result of this effort was the positive assertion that the effectiveness of the integration of form and value could be objectively identified using five performance dimensions and two meta-criterion. These he called *vitality*, *sense*, *fit*, *access*, *control*, *efficiency*, and *justice*, respectively (1984, p. 118).

Vitality is the degree to which the physical form of an urban settlement supports the life functions and biological requirements of the people which live in it. This dimension reflects the need for relatively safe and supportive living environments. Sense is the extension of Lynch's imageability concept into a dimensional structure. It is defined as the degree to which settlements can be perceived and mentally differentiated in time and space. In contrast, fit is achieved when the form and capacity of a given space matches the demands that are placed on it the urban populace. This dimension emphasizes the development of manipulable environments with high degrees of resiliency. Finally, accessibility refers to the degree to which people can repair, manage, and modify the spaces which they occupy. The two meta-criterion – efficiency and justice – apply to each of the performance dimensions and place considerable emphasis on the maintenance and just distribution of costs and benefits throughout society (Lynch, 1984, p. 121-235).

Admittedly, Lynch (1984) accepts that these performance criterion are not mutually exclusive and that their relative importance or transferability between cultures is subject to question. These criticisms miss the point of his exploration, however. As he explains,

> "Design deals with qualities, with complex connections, and also with ambiguities. City design is the art of creating possibilities for the use, management, and form of settlements or their significant parts. It manipulates patterns in time and space and has as its justification the every day human experience of those patterns..." (p. 290-291).

The five performance dimensions are not to be accepted in these terms as universal standards of what makes environments meaningful and vibrant. Rather, they provide a starting point

from which it is possible to investigate and assess the relative merits of the environment. Each performance dimension embodies a normative statement about what cities should be and a procedural notion of how to attain them.

2.2 Synthesis: A shared vision of urban space

Each of the various theoretical positions has been related as a distinct and isolated approach for investigating the significance of meaning and symbolism as critical determinants of the urban environment. It should be evident, however, that these theories are far from being independent of each other. Rather, it is the position taken here that although there is considerable variation that fundamental similarities can be uncovered. It is the objective of this section to highlight these similarities in order that they may be contrasted to some of the other relevant research in this field. This section will attempt to use these comparisons as a basis for developing key insights which have relevance to the field of urban design.

At the most general level, three observations which form useful starting points for discussion are apparent. First, our present inability to develop meaningful urban environments can in part be attributed to a lost or weakened idea of the city (Jung, 1964; McMillan, 1979; Rykwert, 1988). The second observation restates this problem as a crisis of models that effects the urban designer's ability to understand which factors contribute to the identity of the urban place (Ferri, 1988). Not only has the comprehensive notion of those factors that constitute a vibrant city been eroded, but there is also little appreciation of those environmental characteristics that are understood (Norberg-Schulz, 1965, 1980). Finally, there is a need to develop a common language which relates physical form, environmental quality, and human values (Alexander, et al. 1977; 1979; Lynch, 1984; Rossi, 1982). The challenge is to develop a vocabulary that can speak to the processes of city building rather than to its "contours" at any particular moment (Appel, 1988, p. 15).

Clearly, the realization of meaning is predicated upon some internal notion of merit or value. This is evidenced by Jung's (1964) observation that a true process of spiritual growth

(which he termed individuation) is solely dependent on a personal assessment and interpretation of symbolic themes. Meaning is valuable since it restores the psychological equilibrium and facilitates the process of individuation. Taken in a broader context, it is possible to see that

> "...the very character of the environment itself – of what is or may be environmental to [any individual] – is expanded so that it becomes necessary to think of the environment not as a given reality, but as a reality subject to symbolic definition" (Hewitt, 1984, p. 33).

This is not troublesome since it is logical that individuals are only able to respond to those environments which hold some symbolic value for themselves (Lowenthal, 1961). Conversely, however, where there is general disagreement about which elements define the urban environment (i.e. when the conception of what cities "ought to be" is poorly articulated), it follows that urban symbolisms should become weaker and more fragmented. This is a very significant point in light of recent articles which point to the growing divergence between the theory and practice of urban design (Kreditor, 1990; Palermo, 1990; San Martin, 1988) and that the challenges of the next century will surely force an ongoing evaluation of what constitutes good city form (Colbert, 1988; Pihlak, 1988).

While the implications of these findings are self evident, the possible responses are not. To elaborate on this point consider the following quotation –

> "Simply calling to mind what the city or the house, nature, tools or work have become for modern and nonreligious man will show with the utmost vividness all that distinguishes such a man from a man belonging to any archaic society, or even from a peasant of Christian Europe. For modern consciousness, a physiological act – eating, sex, and so on – is in sum only an organic phenomenon...But for the primitive such an act is never simply physiological; it is, or can become, a sacrament, that is, a communion with the sacred" (Eliade, 1959, p. 14).

Clearly, today's society is a long way from those unified ancient civilizations like the one

portrayed above and around which Rykwert (1988) and others have centered their arguments. In fact, Rykwert admits that it is extremely unlikely that a single urban idea will be so predominant as to give meaning to city forms in so many cultures as was possible in these ancient societies. This is not the point. Although it is certain these cosmologies had a significant impact upon the societies of the time, it is much less certain what the ethical, psychological, and behavioural implications of this type of image would be, imposed or otherwise, on society in general (Gold, 1980; Lang, 1988). Speculations by Lynch (1984) and experiments with computer simulation by Hillier and Hanson (1984) seem to suggest that this ideological rigidity may be as harmful as it is valuable to the establishment of stimulating and meaningful urban environments.

That it is necessary to develop a language which expresses the relationship between physical form and urban quality is a helpful conclusion. This is evidenced by the fact that designers must be able to describe a situation before it can be recognized and communicated effectively through design (Alexander, 1979; Kemble, 1989, p. 52). This is no easy task. Realistically, none of Lynch's (1984) *performance dimensions*, Norberg-Schulz' (1980) *genius loci*, Rossi's (1982) *typology*, or Alexander's (et al, 1977; 1979) *pattern language* has the stability to work as a soul basis for proceeding in this direction since they have not clearly articulated the relationship of space and society. Therefore while an environment may be well-designed, it is also possible that it will not be socially viable. Hillier and Hanson (1984) seem to have provided a theoretical position which resolves this conflict, and in fact, lends greater relevance to these other "languages".

As it was presented in the previous section, Hillier and Hanson's (1984) theory emphasizes the relationship between social forces and the transpatial generators of particular physical forms. A transpatial integration of objects once arranged, develops a series of socially workable environmental forms. By extending this distinction to the concepts of "type", "performance dimension", "pattern", and "genius loci" it is possible to re-define them not as spatial relations, but as parallel expressions of similar transpatial qualities inherent in

society. This way their differences are minimized and the essence of their message as relations which exist as precursors to form is maximized.

Still, there is relatively little in this re-defined morphological language which could be of practical use for urban designers. Overwhelmingly, each of the authors has understood that symbolic meaning is developed only through an evolutionary process which usually takes place at the intuitive or unconscious level. Since many arguments support the importance of meaning for the fulfillment of human life – "Man is always reaching out for meaning, always setting out on his search for meaning; in other words what I call the will to meaning is even to be regarded as man's primary concern" (Frankl, 1978, p. 3) – a paradoxical situation for the urban designer is created. The question is no longer – "Is a meaningful environment important?" – but rather – "How is it possible to *plan* for meaning in the urban environment?". In many ways, the answer to this question is the question itself, forcing us to continually understand our environment and our place in it. That is, to understand our humanity.

This is the approach to urban designing which is theorized as "a possibility for the 21st century" by Thomas Vint (1988). Effectively, Vint translates Heidegger's three part definition of the structure of being – self-actualization, self-awareness, and self-realization – into a normative model for city building at a truly human scale. Self-actualization is the manifestation of our own existence by the achievement of some action designed for that purpose.[4] It occurs by and implies a state of being with some thing. This constitutes for Heidegger the concept of "dwelling" from which a personal world of meaning is created (Vint, 1988, p. 51). This definition emphasizes the directionality and ordering of one's intentions and an identification with the closeness of other things. The requirements of this *space of self-actualization* are therefore characterized by a variety of types and contextual forms; spaces which are bounded to delimit places; space which is defined by loosely fit and irregular mosaics; a predominance of diverse and asymmetrical shapes; and ambiguity at the edges of spaces (Vint, 1988, p.52).

Similarly, self-awareness is an interpretation of "how one is" through an examination of

conditions which cannot be changed, inherited traditions, and sedimented personal experiences. Consequently, the *space of self-awareness* is intrinsically non-spatial, placing an emphasis on the internal synthesis of intentions. The urban form consequence of this relation is a highly articulated environment which gives priority to and affirms human existence (Vint, 1988, p. 54). Finally, self-realization is the discovery of new ways of existence. The *spatial conception of self-realization* emphasizes investigation and contact. Here Vint underlines the importance of environments with fine to medium grain texture; systems of inter-penetrating spatial patterns; and open endedness. His final conclusion is that the effective aggregation of these formal characteristics which correspond to the three forms of human existence will develop a more versatile and affective environment (p. 56). Space is then able to take on an even greater level of meaning as an expression of those themes which are internal to every human being.

2.3 Chapter summary

There is little doubt that it is necessary for our urban environments to be meaningful and responsive. It remains unclear, however, what steps or actions can make the difference in assuring that future city environments will develop in this way. In a positive light, two key points have been identified that will be given additional consideration in the following chapters.

The first point is that meaningful city environments are built out of a clear conception of what the city should contain, who it is for, and what its physical environment should be like. This is not to say that everyone should have the same "idea" or that some positions are inherently better than others. Rather, it is much more important that future approaches to urban design be predicated upon a search for those environmental qualities which are of critical importance to the collective understanding of what the city is all about. This implies that meaningful urban design results from a process of investigation, differentiation, experimentation, and evaluation. Intuitively, this is a radically different position than that

which has been previously taken. The urban designer of the future is not the master builder of the past.

The second point is that a well-founded spatial language or urban design vocabulary is essential to the success of our vision for the future. As in the first instance, it is not possible to ascertain what the form of this language should be beyond the most general assertions. Clearly, it must recognize that there is a fundamental difference between being able to describe physical space and spatial relationships and being able to explain the utility of space and space systems. For this reason, it is encouraging that the findings of the following chapters demonstrate that recent efforts in this area have attempted to account for this difference.

A final observation serves well to put these two basic findings into context. It is that the search for these two elusive *necessities* will be the significant feature of the practice of urban design into the future. This is, perhaps, the only thing which is certain. As a certainty, the future for urban design looks bright since it is the search for a shared vision of urban space which may be the most constructive source of meaning in the urban environment.

Notes

[1]The contribution of C. G. Jung cannot be characterized as true urban design theory. Rather, it is much more valuable to view it as a general theory of symbolism and meaning that has had a seminal influence on research efforts in many fields of study. From this perspective, Jung's work is of critical importance to all designers because it establishes a comprehensive platform from which it is possible to interpret and explain the relationship of man to his environment. This point supports the inclusion of his work for the purposes of this chapter.

[2]An illustrative interpretation of the Christ sign in this way recalls the reconciliation of man to God by Christ's death in the doxology – "Through Him, With Him, and In Him". This extension of the concept is speculative at best. Still, it serves well as an example to demonstrate the linkage between the various levels of meaning which have been unified by this conception of space in yet another way. It has been retained for this reason.

[3] Here McMillan provides an elaboration of the Vitruvian tripartite classification of the function of architecture – *venustas*, *firmitas*, and, *utilitas* (Vitruvius, c. 27 B. C./1960). Others such as Norberg-Schulz (1965) and Steele (1973) have employed this same or similar

distinctions. McMillan's adaptation (while not perhaps the most well developed) is employed here as it is familiar to the author.

[4]Frankl (1978) prefers the term "self-transcendence". In this sense, "it is the very 'pursuit of happiness' that obviates happiness" (p. 39) not the achievement or *actualization* of it. I also prefer this notion to Heidegger's.

CHAPTER THREE

THE LANGUAGE OF URBAN DESIGN

"To influence the growth of cities, the designer must have a clear concept of the underlying design structure that must be produced to set in motion the involved processes of city-building."

– Edmund N. Bacon, 1967

"For a designer, what is not lit up is as important as what is deliberately illuminated and how it is lit: the considerations of raw realism versus the intrigue and drama backstage. People will fill in the unknown places from their private stock of visions and make what they see their own. That is the chiaroscuro effect, endless levels and planes for the imagination to pursue. It is better to trust the audience to paint into the shadows themselves and embellish the darkness with the richness of their own fantasy."

– Andrew Bridge, 1990

Qualitatively, design is both a science and an art. It is concerned with the necessary techniques of construction as well as with the aesthetic composition and development of particular environments. As a part of the planning field, the design work of architects and planners has often sought out the essential linkages between these two aspects of designing. It has even been argued by many writers that the purpose of urban design has always been to develop connections between the ideal and practical through the creative process. Today, this position is receiving renewed recognition as planners and architects are returning to the classical works on city building in search of forgotten design principles and strategies (Barnett, 1986).

For this reason, the notions which have shaped and continue to form the active visions that designers hold about the function and structure of urban environments are central to the understanding of urban design practice. The purpose of this chapter is to explore the answers

which *designers* have provided to the following questions – "What is a city?"; "What are some of the key motivations in city design?"; "What factors make well-designed urban environments?"; and, "What are the critical qualities of specific urban forms?". In other words, this chapter is intended to provide an overview of the substantive *language* [1] of design as it relates to urban planning.

To accomplish this task, the following sections concentrate on two main areas. The first gives emphasis to the influential role played by utopian city visions as determinants of urban form and design practice while the second concentrates on the relevant contributions of architecture and design theory. Conclusions are drawn about the inter-relationship of urban design techniques and these two types of over-arching philosophical construct. The concluding section summarizes these findings and highlights those issues which are critical for developing a detailed understanding of the place of design within the fabric of urban planning.

3.1 Utopian visions and urban design

Even though most utopias aspire to be comprehensive in their orientation, it is possible to identify groups of utopian proposals that focus primarily on the physical environment and social reconstruction, respectively. The utopian socialists – Owen, Saint-Simon, Fourier, J.S. Mill, and others – concentrated on the reformation of society.

> "If [they] wanted to create that 'no-place' of the perfectly interacting community all [they] might do is increase the communications facilities and let the rest take care of itself. Or [they] might also decide that since all communication has to take place in some place, then [they] might give them all a memorable image. Either way, whatever [they] did its arbitrary nature was bound to appear and also the fact that it reflected a particular ideology or philosophy. *The whole question of place-non-place was thus in a sense rendered obsolete by the growing awareness that all urban problems were based on certain shared values...*" (Jencks, 1986, p. 332; emphasis added).

The substance of these reformers calls for entirely different economic systems and standards of moral behaviour was in this way underlined and given additional merit. Still, the societies that were to occupy Owen's "Villages of Cooperation" or Fourier's "Grand Phalanstère" were so highly evolved that their proponents could not avoid commenting on their particular implications for the form of the environment. As Heilbronner (1961) remarks, "The 'utopia' was not a just matter of idealistic ends; it was also a key to the means"(p. 105). Hence, these utopian visionaries sought to mobilize the active reformation of society, in part, by controlling its shape through the design of buildings, towns, and cities. In contrast, many utopias are meant to be interpreted as ideal physical plans that responded to the harsh realities of life in existing urban environments. "Perhaps the most persuasive characteristic [of these physical utopias] is the way in which they express the city as a singly conceived, complete design solution" (Gosling & Maïtland, 1984, p. 32). It is important to note at this point, however, that all utopias are united by the fact that they represent basic expressions of how people should live in the world around them. They enumerate societal reforms which would significantly impact the function and structure of towns and cities . All utopian proposals viewed from this perspective are relevant to the field of urban design.

After Lynch (1984), it is possible to separate utopian theory into three thematic groupings each focused on a different basic metaphor of what a city is and how it should function (p. 72). The first is comprised of those utopian proposals that are based on a cosmic or monumental model of the city. It reflects the fact that there is a common bond which can be uncovered between ancient cities like Téotihuacan and the idealized baroque city with its concentric plan of radiating avenues. The point is that key themes of domination, control, and mystery are developed using common design techniques such as bilateral symmetry, visual linkages and axial views, varying elevations or size, hierarchy, and enclosure (See Figure 3.1). Similar motivations can also be interpreted in the underlying structure of classic development plans like Haussmann's Paris (c. 1853) and L'Enfant's Washington (c. 1791) even though they were not set out as true utopian statements. Vestiges of this cosmic vision

can also be seen in the overpowering presence of the cathedral in the overall landscape of many towns and cities. The resulting effect is an urban environment which visually expresses the ability of particular groups to exert power over society, the city, and/or the natural environment.

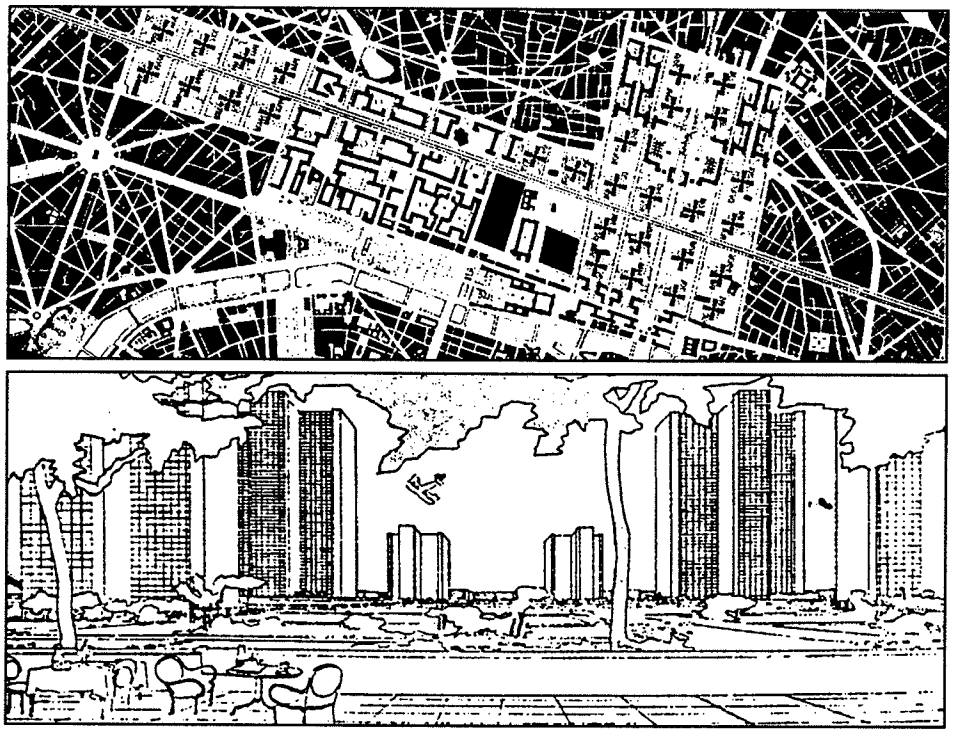
Figure 3.1 - L'Enfant's plan of Washington, D. C. (1791) showing the rigid urban formenvisioned by many cosmic utopian proposals. *The Observations Explanatory of the Plan* (lower left) clearly state that "The positions of different Edifices, and for the several Squares or Areas of different shapes, as they are laid down, were first determined on the most advantageous ground, commanding the most extensive prospects...".

Source: Trancik (1986, p. 153).

The second common utopian metaphor defines the city as a machine. The city is viewed as a completely functional object supporting human life and social development. Some of the key themes which are emphasized in this type of utopia are separation, connection, and efficiency. To illustrate this point, consider that Frank Lloyd Wright's (1958) Usonian ideal – 'Broadacre City' – proposed the decentralization of urban populations to acreage homesteads as the penultimate act of democracy. Similarly, Le Corbusier (1923/1967, 1948, 1971)

believed that the city should be viewed as a machine for living. He developed the 'Radiant City' (*Ville Radieuse*) concept as a series of freeway connected skyscrapers which vertically separated housing, working, industrial, commercial, and recreational areas to expand on this position (See Figure 3.2). These same ideas were taken to yet another extreme in the

Figure 3.2 - Le Corbusier's Voisin Plan (1925) for the reconstruction of Paris embodied the principles of his *Ville Radieuse* concept.

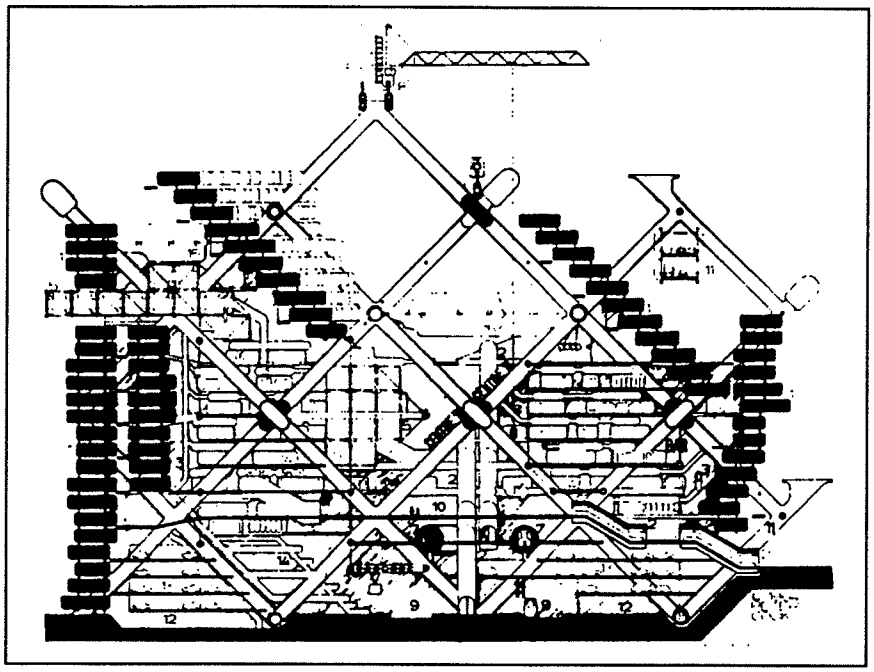


Source: Gosling and Maitland (1984, p. 19) and Trancik (1986, p. 28).

proposals of the Archigram group. Peter Cook's (1964) 'Plug-in City' was based on an urban vision which permitted the city to be infinitely tailored to the needs of individuals. It consisted of a series of towers, inverted pyramids, and modular housing units all connected by tubular transportation connectors (See Figure 3.3). In contrast, Ron Herron's (1964) 'Walking City' was developed as a series of ovoid megastructures supported on huge telescoping legs.

The essential characteristics of this particular segment of utopian theory have characterized much of the development of the modern city. The well known *Congrès Internationaux*

Figure 3.3 - Peter Cook's (1964) 'Plug-In City' represents an extreme elaboration of the city as a machine metaphor.

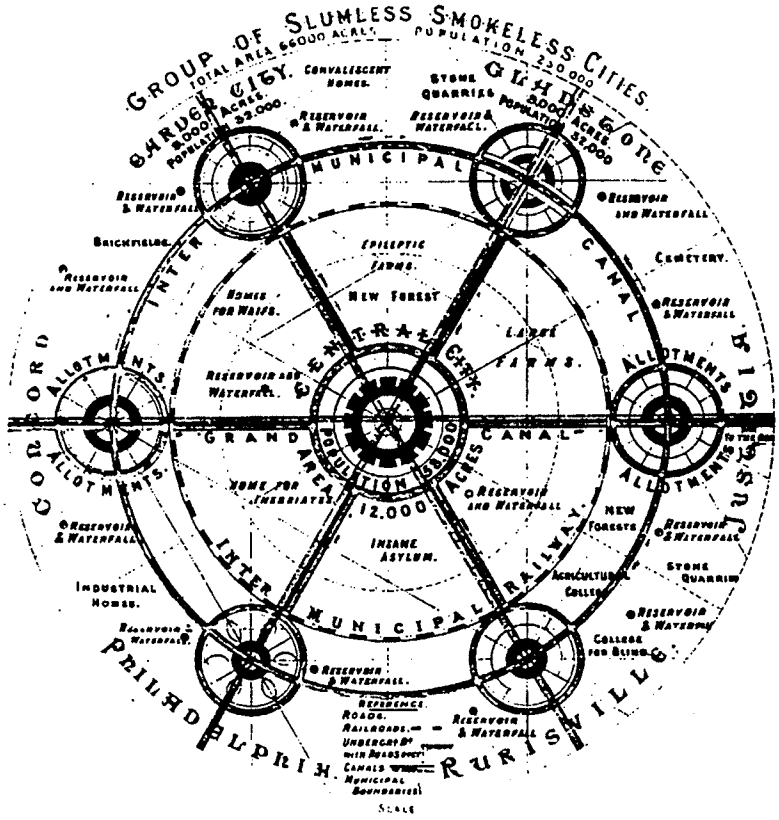


Source: Trancik (1986, p. 111).

d'Architecture Moderne (CIAM) Charter of Athens (1933/1963) is a case in point. It stood for many years as a practical elaboration of development principles based on a classification of the four primary functional purposes of the city – dwelling, recreation, work, and transportation (p. 264-265). It may even be argued that the modern techniques of development control like the zoning by-law and building code are extensions of the principles developed years earlier in the CIAM Charter. Morphologically, however, there is little that unifies the range of machine-based utopian statements. Some notable exceptions include a strengthened emphasis on linear linkages, identifiable parts, and movement systems.

The final group of utopian theories views the city as an organism. The city is interpreted as a complex of inter-related parts which exhibits its own internal "homeostatic dynamism" (Lynch, 1984, p. 89). Furthermore, these inter-related "communities" are believed to operate as distinct and identifiable social and spatial objects. Ebenezer Howard's (1898/1965) vision of the "Garden City" as a unified urban form that brought together the values of country living

Figure 3.4 - Howard's 'Garden City' is a classic example of utopian planning that employed the *organic* metaphor. Here it is pictured as a 66,000 acre development of six "slumless smokeless cities" surrounding a central city with a population of 58, 000. Each of the various nodes are inter-connected by an elaborate canal system and inter-municipal railway.



Source: Tod and Wheeler (1978, p. 118)

and the merits of the city is representative of this school of thought (See Figure 3.4). Combined with the developing ideology of the social sciences at the time and the influential writings of people like Clarence Perry, Howard's vision of the city as a collection of cell-like neighbourhood clusters has had a lasting impact on the modern city as a contribution to the development of the neighbourhood unit principle (Rohe & Gates, 1985). Buckminster Fuller's (1972) candid reliance on technological innovation as the determinant of new architectural structures like the geodesic dome to preserve and enhance the natural living capacity of "Spaceship Earth" is also relevant to this view. The common values expressed

by these utopian statements are adaptation, integration, succession, invasion, and growth. It is not surprising, therefore, that these visions have tended to rely on organically determined forms and shapes as well as strong linkages to the natural environment.

Some general observations can be made about these various utopian constructs as a whole. Since it was first coined by Sir Thomas More (1516/1967) to describe an imaginary island upon which all aspects of social, economic, legal, and political life had been developed to perfection, the concept of utopia has come to hold a much wider significance. This point is easily made in the following way. Many scholars like Tod and Wheeler (1978), Tafuri and Dal Co (1979), Jencks (1986), and Gosling and Maitland (1984) have observed that More's term was developed as a semantic extension of the ancient Greek word *Eutopia* or 'good place'. Literally translated, however, utopia means "no place". From this perspective, it is likely that More's intention was to underline the impossibility of his Utopia, and by analogy of the good place as well, thereby reinforcing the strength of his commentary on the poor social conditions of the time.

Rosenau (1959) has pointed out that this is an important distinction since the common usage of the term utopia has come to be associated with the violent change and reaction against society contained in many of the more radical proposals. He notes, however, that the search for the good or *ideal* place recalls the notion of an integral process of reform within a given society and locality.[2] Effectively, both interpretations are necessary for an accurate assessment of the contribution made by utopian planning schemes to urban planning. This is because a clear utopian vision operates as a corrective guide to action in addition to presenting a challenge for future development. In the utopian proposal this is "...achieved by a clear realization of the functions of the city as a whole and by expressing these aims in a manner which acknowledges the necessity of absolute standards, even if their attainment is out of reach" (Rosenau, 1959, p. 149).

While it has also been one of the main planning functions to search for appropriate urban structures to match the requirements of particular social systems, it is important to note that

"...it is the sad fate of most radical and utopian proposals that they have provided the ideas and techniques that have been used for the maintenance of the system rather than its transformation" (Tod & Wheeler, 1978, p. 127). This position is easily defended since much of the operable vision of the modern city has resulted in an exacerbation of old design weaknesses and the creation of new problems for practitioners (Kemble, 1989). Habraken (1972) puts this finding into a larger context in the following way:

> "The greatest talents in the field of architecture have sought the liberating, all-providing design...The ideal which has been pursued is not only unattainable because, like all ideals, it is subject to the imperfection of man's existence, but especially because the posing of the problem in itself excludes a solution...That is to say: matter is not manipulated in harmony with society, but society is forced to conform to a method which pretends to perform this task...A town is not a thing without people; a town is man and matter together...If a town is created before there is a population, this fatal separation is implied...But today we no longer think of a town as a unity with people, and when we should do all we can to stimulate a process, we spend our efforts in trying to reflect the form of the population in matter. We are very busy arranging in advance conformity of towns with their future populations because we do not understand that a town, a real town, can only emerge when this conformity already *exists*, and that it cannot be achieved by *making* a town, however beautifully or skillfully" (cited in Gosling & Maitland, 1984, p. 37-38).

In the context of the current discussion then, the *new art* of city planning can be more clearly appreciated as the sensitive coordination of tradition, value, innovation, and fact. It is defined by the *practical pursuit* of the right action and of the ideal environment. It is this same motivation which led to the development of the avant garde proposals of Le Corbusier, Fuller, Owen, Archigram, and many other utopian visionaries. Unfortunately, it also weakened the effect that some of these proposals ultimately would have as the designers could not address the massive social changes which would have been required to make these visions operable–opting instead to assume literally everything away. As a result, "...the total image was [often] reduced to a mere decorative enhancement of the metropolitan chaos it

once aspired to dominate" (Tafuri & Dal Co, 1979, p. 390). Even though this observation is accurate, it is not completely relevant given the function which utopian thinking has played for designers in the past. What these utopian planners clearly believed is that utopian ideals set the parameters for the ultimate challenge of urban design – to seek out and enter into the "elusive city" (Barnett, 1986).[3]

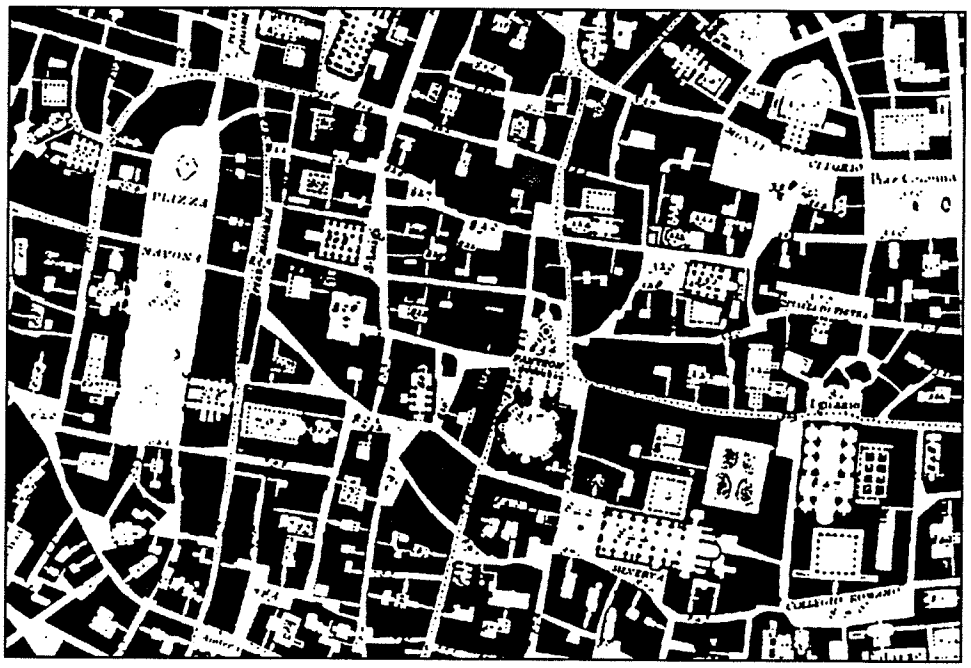
3.2 Architecture, building, and design

This section is intended to provide a review of some of the relevant contributions to urban design which have been made by architecture and design theory. Trancik (1986) differentiates between three different stances with respect to urban design theory. *Figure-ground theory* is directed at the exploration of urban space as it is created by the alternation of the accumulated building mass. *Linkage theory* emphasizes the sense of visual connection and order in the urban environment. Finally, *place theory* is oriented towards the development of the historical, social, cultural, and natural physical characteristics of particular city spaces.[4] Each of these approaches will be examined in greater detail by concentrating on the key physical elements and qualities which are emphasized from each perspective.

3.2.1 Figure-ground theory

Figure-ground theory is founded on the study of the relative land coverage of buildings as solid mass to open space. Using this approach, the city is visualized as a patterned alternation of built solids (i.e. figure) and open voids (i.e. ground). Attempts are made to change the underlying structure by "...adding to, subtracting from, or changing the physical geometry of the pattern" (Trancik, 1986, p. 97). It is for this reason that Gosling and Maitland (1984) have characterized this approach to planning as *urban design by collage* (p.138-140). The objective of these interventions is to clarify the existing patterns of urban space by establishing an hierarchy of internally organized and enclosed spaces which are ordered in relation to each other. Hence, the primary concern of figure-ground theory is with the specific morphology of urban spaces and the underlying relationships which exist between them.

Figure 3.5 - The Nolli map of Rome (c. 1748) illustrates how *positive* public space is *carved* out of the mass of private buildings. The predominant feature is the figural open space system.



Source: Gosling and Maitland (1984, p. 42).

Perhaps, the best illustration of this approach to urban design is Giambattista Nolli's (c. 1748) map of Rome (See Figure 3.5). From this map, it becomes immediately apparent that there is a coherent relationship between the block pattern of Rome and the specific location of public buildings. These object buildings are set into the overall pattern of development and are fronted by large civic open spaces. Similarly, they are clearly differentiated from those areas which form a part of the surrounding field of private buildings and squares. In addition, the public open space takes on the quality of a figural void which has seemingly been cut out of the dense mass of private buildings. This creates a *positive sense of space* in which the nature of the space itself becomes more important than the individual buildings which define it.

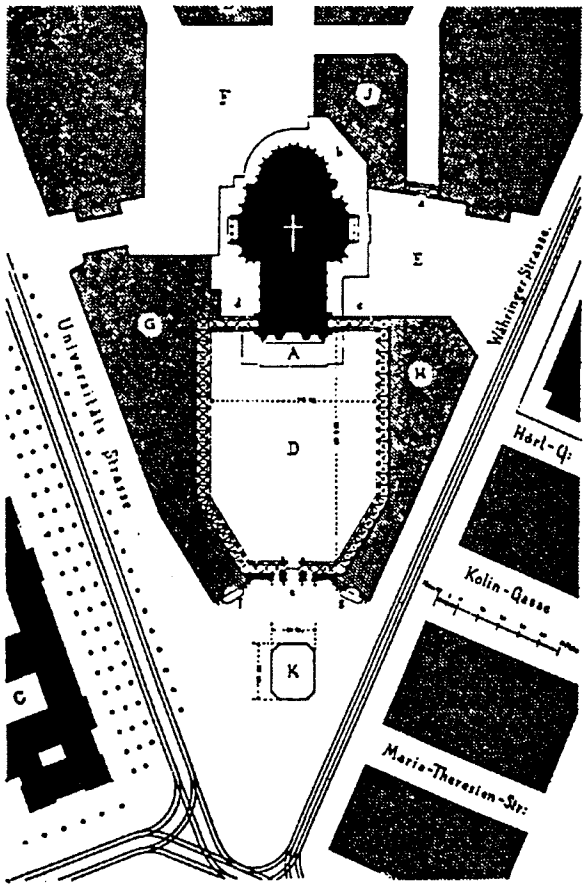
In contrast, Figure 3.6 shows the figure-ground diagram for a typical modern city. Compared with the Nolli map, two critical observations immediately become apparent. The first is that the modern city lacks the critical land coverage which is necessary to develop a

Figure 3.6 - A figure-ground drawing of downtown Winnipeg, Manitoba illustrates how the predominant formal qualities of the modern city are the lack of continuous development and the figural nature of office towers and skyscrapers.

positive sense of space. Second, the figural nature of modern buildings and skyscrapers is underlined. It is possible to see that the modern city is structured to give prominence to the individual building and lacks the connective block structure which causes the perimeter wall of outdoor spaces to be well articulated as "rooms", plazas, and corridors (Hesselgren, 1975; Trancik, 1986). The resultant effect is an erosion of public space as a consequence of the shortage of continuous development. It is this factor which prevents the development of an effective urban space network.

The major emphasis from the perspective of figure-ground theory is placed on the reparation of the *urban fabric* by reconstructing existing block structures and interpreting them in new ways. The classic example of this type of intervention is Sitte's (1889/1986) plan for the Votive Church plaza in Vienna (See Figure 3.7). Here Sitte proposed introducing several new buildings to develop a central atrium space in front of the main church facade

Figure 3.7 - Plan by Camillo Sitte for the transformation of the Votive Church plaza. Legend: A - *entrance to church*; B, G, H, J - *infill buildings*; D - *new central atrium*; E, F - *new plazas*; K - *location for new monument*; a, b, c, d, e - *entrances or archways*; f, g - *new fountains*.

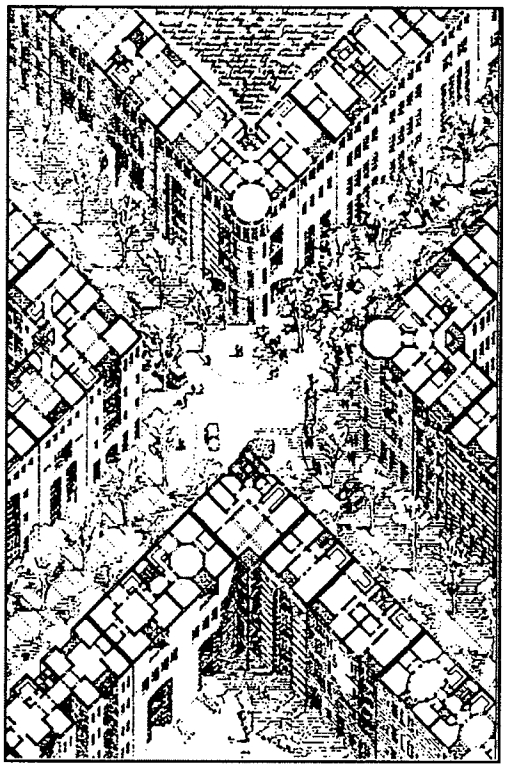


Source: Sitte (1889/1986, p. 282).

and to create new enclosed plaza spaces in other locations. Qualitatively, these changes refined the existing block structure and developed a strengthened contextual setting for the Church. The most valuable contribution made by this proposal, however, is the derivative effect of these local changes which significantly improves the organizational qualities of the larger open space system.

The work of Leon and Rob Krier is also based on principles which have their origin in figure-ground theory (Krier, 1979; Papadakis, 1984). In fact, Rob Krier stated in developing his new urban typology that the intent was not to redefine the notion of space "...but rather

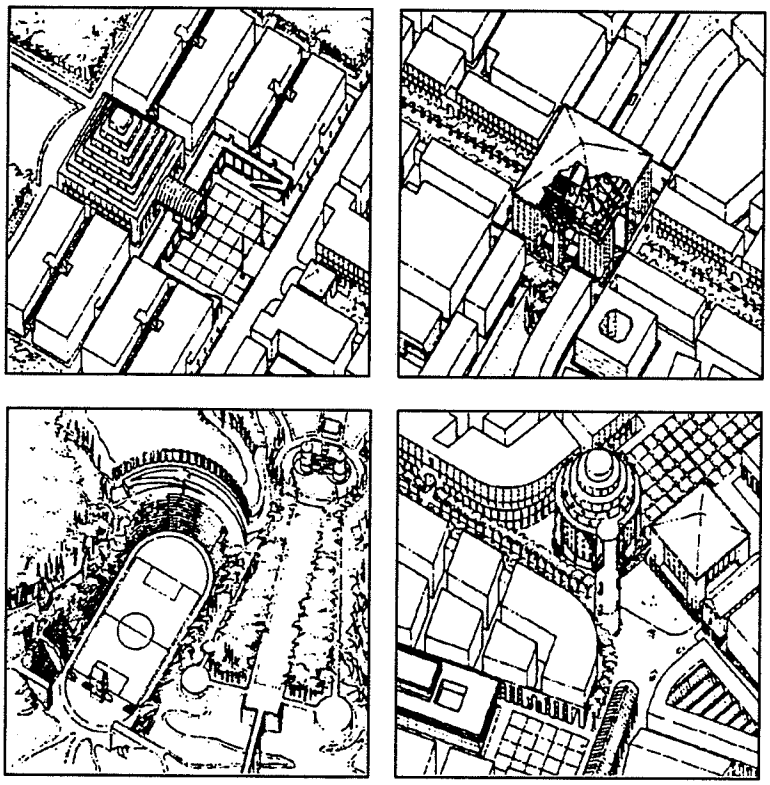
Figure 3.8 - Design by Rob Krier which fits modern apartments into smaller scale buildings that emphasize the regular block pattern of the traditional European city.



Source: Barnett (1986, p. 61).

to bring its original meaning back into currency" (1979, p. 15). In accordance with this position, the work of both brothers has concentrated on improving the urban structure by reinterpreting the city block (See Figures 3.8 and 3.9). Significant effort has been directed at developing a connected pedestrian open space system and providing a formally defined open space network. Their designs work towards creating a *transparency* in architecture that provides for a free flow of movement between internal and external spaces. They have also stressed the importance of reducing building heights to scales which are similar to those of the traditional European street. This improves their horizontal ground coverage and reduces the destructive impact of individual object buildings on the urban space system.

Figure 3.9 - Leon Krier's proposal for the redevelopment of Luxembourg (c. 1978). Here object buildings are incorporated into the existing block plan and pedestrian linkages serve to enhance the open space system.

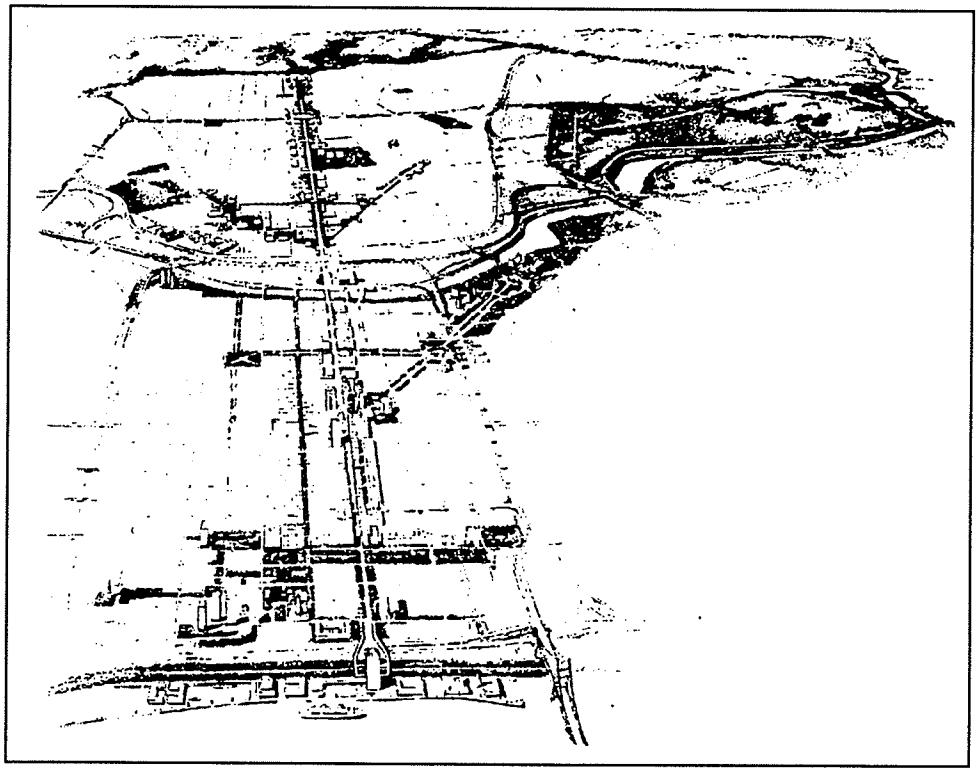


Source: Trancik (1986, p. 119).

3.2.2 Linkage theory

Linkage theory is derived from the interpretation of "lines" or visual linkages between urban elements. These linkages are formed by streets, pedestrian ways, linear open space systems, or other connective elements. In effect, the urban designer is charged with structuring important open spaces and architectural features into a network. Trancik (1986) has noted that the challenge from this perspective is to develop a spatial *datum* and the corresponding determinant lines of force which relate buildings to other key elements and improve the overall order of the environment (p. 106). The urban fabric is interpreted as a dynamic web of these inter-connections that can be changed and re-ordered without drastically altering the total urban structure. Additional attention is given to the development

Figure 3.10 - Edmund Bacon's (1964) Downtown Philadelphia Redevelopment Plan demonstrates an application of linkage theory. The main intervention consists of a rigidly defined series of linear connections between primary architectural elements occupying prominent cultural and natural/physical locations.



Source: Bacon (1967, p. 300-301).

of the macro-structural linkages in the urban environment while smaller scale patterns and occurrences are left to chance (Attoe & Logan, 1989). As a result, area-wide movement systems and the efficiency of linear infrastructures take precedence over definitive patterns of urban space.

Bacon (1985) elaborates on linkage theory in the following way:

> "The urban designer creates a channel of movement which induces shared sequential experiences among the large numbers of people who use it, which creates a consensus leading to a political force desiring or demanding enrichment or extension of the original movement channel into a broader, more inclusive, more functional and aesthetically satisfying system. This provides a framework for a more inclusive and satisfying perception of the

> city as a whole, strengthening and enriching the sense of orientation of the individual to the city as a larger system, and inducing or generating a deepened and enriched sense of loyalty and identification of the individual with the city as a total economic and social system. It can give new dignity to existing landmarks, natural features, symbols or institutional structures, incorporating them into a total system. It may establish new locations and new institutions which suitably fulfill the particular needs that point in the total system of channels of movement" (p. 178).

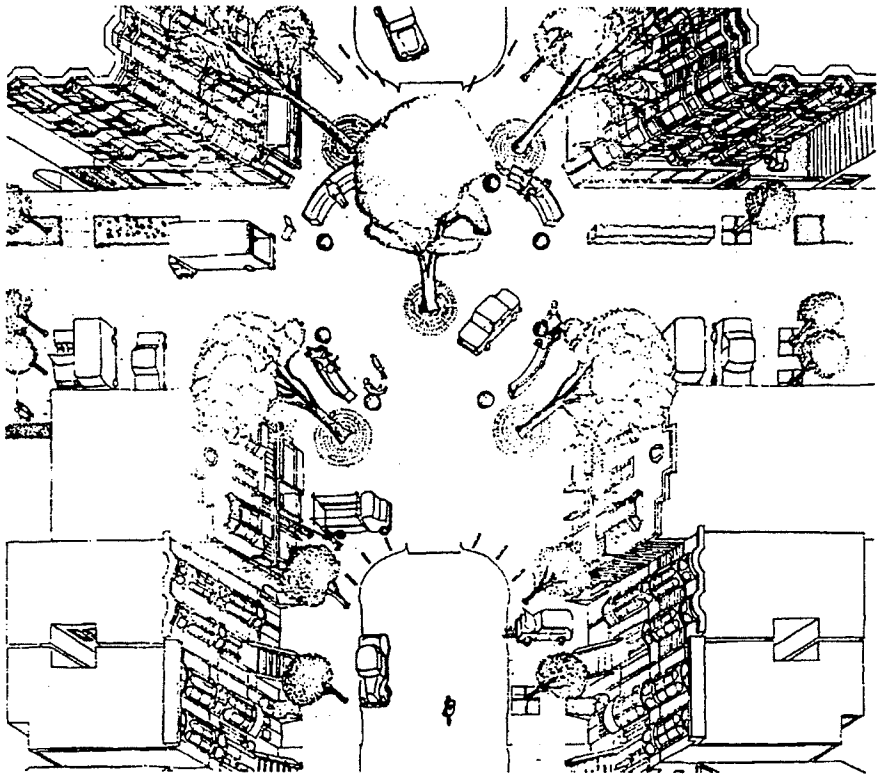
These same principles have been applied by Bacon in a number of projects as a means of revitalizing inner city neighbourhoods (See Figure 3.10).

3.2.3 Place theory

Place theory is concerned with the development of the contextual dimension of urban spaces. It involves the integration of activities, the development of identity, and the recognition of the important natural physical and social/cultural environments of a given urban area (Leesan & Agyeman, 1986). Design interventions that are concerned with developing these place-defining qualities are often depicted by a set of sequential drawings illustrating user perceptions and the potential behavioural patterns of future inhabitants. Effectively, they are intended to nourish rather than direct the development of specific areas by keying on specific incremental additions which can improve the quality of the pedestrian experience. In the terminology of Jane Jacobs (1961), place theory represents a technique for creating *organized complexity* through the development of small-scale elements that significantly impact on the experiential qualities of neighbourhoods and streets. The design process works in this way to alter the built environment and to guide the transition from *space to place* (See Figure 3.11).

As a philosophy of design, place theory is based upon satisfying a fuller range of human needs including those which are at least partially met by the visual environment (Whistler, 1980, p.5). This is demonstrated in the work of Gordon Cullen. Cullen breaks down the environment into four components (Grebner & Bermudez, 1988). The *behaviour of the*

Figure 3.11 - Place theory is an attempt to develop the identity of streets and neighbourhoods by emphasizing small-scale interventions and qualitative improvements to the pedestrian experience. This is seen in this design for a residential street by Peter Bosselman.



Source: Bosselman (1987, p. 324).

environment – the way in which people experience it – corresponds with his definition of physical space. *Contact* is Cullen's human space parameter and is defined as the human occupancy and enjoyment of the space. The *memorability* of the environment consists of the basic psycho-physical characteristics which help people to find their way. Finally, *relationships* form the basic interactions which foster discovery in the urban place. Through "...behaviour and contact meeting in memorability, and each and all of them structured by relationships, form and content become unified into a whole through an understanding of the psycho-physical relationships of the urban environment" (Grebner & Bermudez, 1988, p. 46).

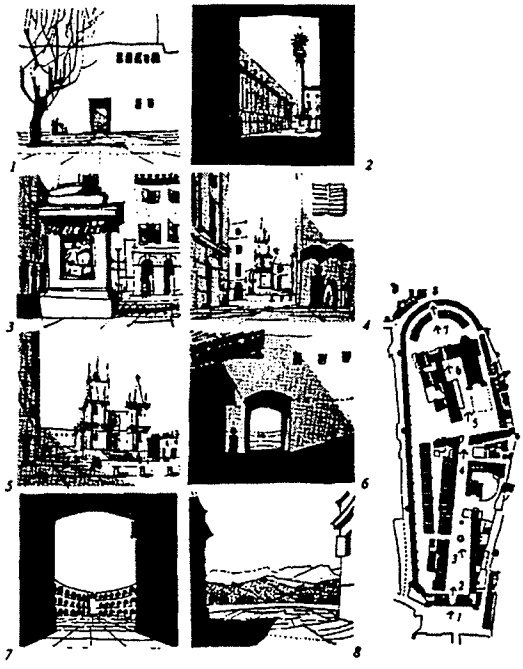
Given this rationale, the experiential qualities of the environment form the critical point

of departure for Cullen. This factor also necessitates his development and dependance on the "serial vision" technique (1961, p. 9). Employing this technique, designers are forced to continually visualize the environment as a series of existing and emerging views (See Figure 3.12). This helps them to develop an understanding of the place and allows them to build in it, the sense of here or there; of this or that. In his own words,

> "...we can therefore postulate an environment which is articulated as opposed to one which is simply a part of the earth's surface, over which ant-like people and vehicles are forever swarming and on to which buildings are plonked at random. Consequently, instead of a shapeless environment based on the principle of flow, we have an articulated environment resulting from the breaking-up of flow into action and rest, into corridor street and marketplace, alley and square (and all their minor devolutions)" (1961, p. 182).

Another example is Kemble's (1989) conceptualization of place-making as an applica-

Figure 3.12 - Gordon Cullen's principle of serial vision demonstrates that the sequence in which people encounter urban spaces effects the overall impression which is developed from them.



Source: Cullen (1961, p. 18).

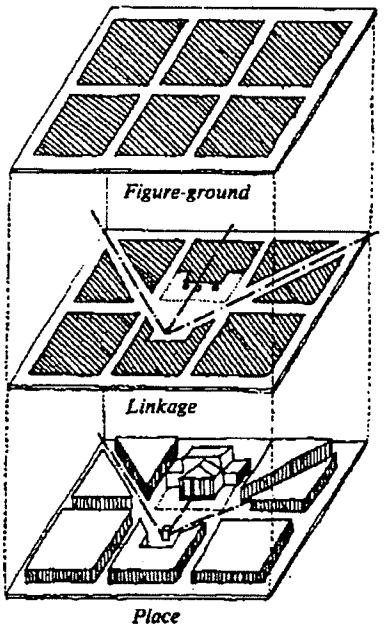
tion of the *principle of sustained interest.* It states "...that the surfaces enclosing a public open space must have a lasting and stimulating quality" (Kemble, 1989, p. 73). Sustained interest is developed through the concerted development of the basic elements of urban space - *plastique*, *palette*, and *emploi*. Plastique is that characteristic which describes the volume of urban space and considers the specific scale, closeness, and surface composition of the surrounding buildings. Pallette refers to the color and texture of the materials which are used to construct the urban space, while emploi relates to the type and intensity of activity carried out in it. Kemble believes that utilizing these three parameters to structure the design intervention will result in an inherently stronger and more enjoyable urban experience. This strengthens the identification of an urban area's residents with the special qualities that make it possible. It is this type of *shared vision of urban space* that can then be capitalized on to guide future development as a means of improving the quality of the street.

3.3 Synthesis: A language connected to vision, a vision connected to technique

Upon first consideration, it seems that there is relatively little which unites the body of utopian proposals with the various theories of urban design as they have been presented in the previous section. However, closer examination will reveal that an important tie exists which binds the two together as integral parts of the theoretical basis of urban designing. The formalization of space that has been identified as a prominent aspect of many cosmic/ monumental utopian visions is related thematically to the developing body of figure-ground theory. In addition, the promotion of functional and visual connections in linkage theory is central to the functionalist vision of the city while, at the same time, the development of meaningful and identifiable places corresponds roughly with the organic metaphor. These similarities underline the fact that urban design theory connects the central vision of what the city is and how it functions with the basic techniques which are used to realize it. This reinforces the value of the specific urban vision as a referential concept which guides the process of design inquiry.

It has not been sufficiently demonstrated whether place, linkage, or figure-ground theory is necessarily more appropriate than the other two. In fact, it is clear from the preceding section that these three theories of urban design are perhaps, more consequential and inter-related than they are competing expressions of goals for development. This is logical since figure-ground theory recognizes the importance of urban space, linkage theory develops an overall understanding of structure and connectedness, and place theory promotes the development of the contextual nature of the city. Trancik (1986) has proposed that a new urban design be founded on the integration of the best characteristics of each perspective. He stresses the importance of five critical factors for future design and planning exercises to accomplish this task (See Figure 3.13).

Figure 3.13 - An illustrative representation of the complementary nature of the three theories of urban design. Roger Trancik (1986) proposes taking the best characteristics from each perspective and developing them as an "integrated approach" to urban design.



Source: Trancik (1986, p. 98).

First, he believes an emphasis should be placed on *linking sequential movement* by connecting the existing environment into a sequentially ordered and unified space. The key

elements in this respect are the central movement corridors and transitional areas between spaces. Second, design should enhance *lateral enclosure and edge continuity*. Efforts should be made to establish a consistent and recognizable street form by filling in gaps and maintaining the continuity of street walls. Ideally, building forms should be used to create spaces and give directional flow to the environment. In addition, attempts should be made to establish a symmetrical hierarchy of public space using *axis and perspective*. Clearly defined axes will provide the baseline from which it is possible to see order in the environment. The fourth factor is *indoor/outdoor fusion*. Urban designers should attempt to develop a transparency in architecture so that movement can flow freely between interior and exterior spaces. Finally, design should accommodate an uninterrupted *bridge of activities* that would in turn enhance the life and interest in all parts of the city.

Others have attempted to integrate these previously competing positions into prescriptions for action with varying degrees of success. For example, Attoe and Logan (1989) have recognized in an analysis of various redevelopment projects that a connected approach to urban design creates the potential for a series of *catalytic design reactions* focusing on particular physical attributes which order, unite, structure, and identify the direction which future development is likely to take. The similarity that exists between each of these particular expressions is self-evident and reinforcing as the basis of a *design-based* vocabulary of urban planning.

Still, the problem remains that the

> "...urban vocabulary of architects and urban designers, while it may serve some purposes, is in fact substantially incongruent with the public's urban vocabulary. For buildings alone, the site plan's emphasis on size and shape and its inattention to the location and behaviour of users, to visibility, to contour, and to social significance are a cause for concern...A good predictive formula [on the other hand] would give the planner and designer a vocabulary of urban attributes which could be used in several ways. He could coordinate urban form and visibility with the active experience of the inhabitant, so that

> the latter could find his way more clearly around the city. He could also coordinate form, visibility, and action with community significance to create a more meaningful city. Further, if the designer wanted to encourage a sense of community, preserve privacy, or stimulate change and new interactions, he could propose which elements and attributes might be seen from particular population groups making some clear and distinct, others ambiguous" (Appleyard, 1969, p.154-155).

It would also allow for ongoing evaluation, differentiation, investigation, and experimentation during the urban design process. Each of which was identified as an emerging challenge for the practice of urban design from the last chapter.

Clearly, the substantive body of design theory does provide an organizing mechanism for urban design practice which is oriented to spatial constructs and design. In addition, considerable effort has been made to move beyond the dogmatism of particular design perspectives and to emphasize the experiential quality of the environment. However, it is a long way from being used to definitively evaluate the appropriateness of proposals beyond the parameters of these self-reinforcing concepts. In other words, beyond the dictates of "good" design. Given this fact, many architects and planners are more frequently incorporating the findings of other related fields of research like the social and natural sciences to find justification and support for specific urban design schemes. The findings of this research is the subject of inquiry in the next two chapters.

3.4 Chapter summary

The relevant contributions of architecture and design theory can be viewed as a practical extension of the various normative utopian positions which designers have utilized to view the city. This is because planners have worked to translate their understanding of the city and its purpose into models for directing design inquiry and intervention. Viewed from this perspective, two critical observations were made that deserve recognition.

The first observation is that the contemporary language of design exhibits several

characteristics which should be central to the development of a conceptual framework for urban design review. It links the intended vision or outcome with the practical techniques and methods utilized by designers. It also provides a spatially-oriented approach to organizing design inquiry. There is room, however, to develop a language of design which is based on the complementary aspects of figure-ground, linkage, and place theory. Representative of this fact, work in the design fields has come to emphasize the importance of urban structure and coordination, developing a sense of space, and translating contextual requirements into place-defining elements within the design.

The second observation is that a design-based language is not in itself acceptable or adequate for structuring an acceptable model of urban design review. Much of the particular knowledge which it utilizes is tied to the intended visions of the city which designers hold. As a result, this type of language is predominantly focused on the physical form which the environment *may take* and is thus disconnected from the ways in which the environment exists or is utilized by people. Hence, several basic questions remain – "What is the relationship between human behaviour and urban design?"; "How do the urban and natural physical environments relate to each other?"; and, "What are the implications of a comprehensive framework for urban design review?". These questions will be addressed in the following chapters.

Notes

[1]The term *language* is used here to refer to the formative notions and concepts of a body of theory as well as to their common usage and application. This application is in contrast to Alexander's (et al. 1977; 1979) concept of "pattern language" which refers to a specific morphological syntax that unites design and values (See Section 2.1.6). The distinction is that the more general usage intended here subsumes and includes all of the specific "pattern languages" which can be potentially developed as a part of the field of urban design.

[2]The sentiment of this position is echoed in the following statement made by Patrick Geddes (1915/1968) –

> "Thus we return, upon a new spiral, to town planning as city design. City by city our civic ideals emerge and become definite; and in the revivance of our

> city we see how to work towards its extrication from its paleotechnic evils, its fuller entrance upon the better incipient order. Education and industry admit of reorganization together, towards sound mind and vigorous body once more. *This unification of idealistic feeling and of constructive thought with practical endeavour of civic ethics and group psychology with art, yet with economics, is indeed the planning of Eutopia; of practical and practicable Eutopia's, city by city*"(p. 365, emphasis added).

[3]Kevin Lynch acknowledges this same influence on the practice of urban planning and design. To qualify this challenge in his terms is to enter into the "possible city" (1990, p. 771).

[4]Attoe and Logan (1989) utilize a four-part categorization of design theory. The *functionalist* stance recognizes the discrete nature of urban elements and underlines the development of the city as a functional phenomena. *Systemic or structuralist* theory emphasizes large scale elements and overall order for the urban place. The *formalist* stance is concerned with the value of particular archetypal or universal configurations of urban space. And finally, *humanist* theory, as a reaction to functionalist design schemes, views design as a collection of intentions, techniques, and ideas related to the development of small-scale environments and day-to-day experiences of the city. This categorization has not been employed here for four important reasons. First, Trancik's (1986) three-part distinction encompasses the major influences to the field of urban design. Second, these influences are centered on specific themes which are central to the rest of the thesis and to specific techniques which have been historically employed by urban designers in the field. Third, Attoe and Logan believe that while each of the four stances outlined above share key values and ideas that they are basically moving in different directions. I felt it was necessary to respect his assertion made in the text of their original discussion. Finally, there is sufficient overlap in the two systems to ensure that all positions are actively represented in the research review.

CHAPTER FOUR

THE HUMAN DIMENSION

"To humanize is to diversify social experience, not to simplify it."

– Michael P. Smith, 1979

"Environments should therefore be designed for those who use them or are affected by them, rather than for those who own them."

– Allan Jacobs and Donald Appleyard, 1987

"Planning for vitality must stimulate and catalyze the greatest possible range and diversity among uses and among people throughout each district of a big city; this is the underlying foundation of city economic strength, social vitality and magnetism. To do this, planners must diagnose, in specific places, specifically what is lacking to generate diversity, and then aim at helping to supply the lacks as best they can be supplied."

– Jane Jacobs, 1961

A central objective of many of the studies conducted in the area of person/environment relations over the past several decades has been to identify the influence that the built environment has on human behaviour. Researchers had begun to hypothesize that the physical structure of living environments was influencing patterns of social interaction even as early as the 1950s. For example, in two separate studies Whyte (1956) and Suttles (1968) attributed parts of the friendship formation patterns and social networking they observed to be a consequence of the physical design of the upper-middle class suburb and inner-city slum, respectively. Over the same period, Hall (1959, 1969) had noted that the specific form of the physical environment was influenced by and related to aspects of human territorial behaviour. These first studies provided an alternative approach to investigation which quickly expanded into a broad field of research encompassing the design professions and the social

sciences. In most instances, the findings of these studies have considerable bearing on the theoretical basis and practice of urban design.

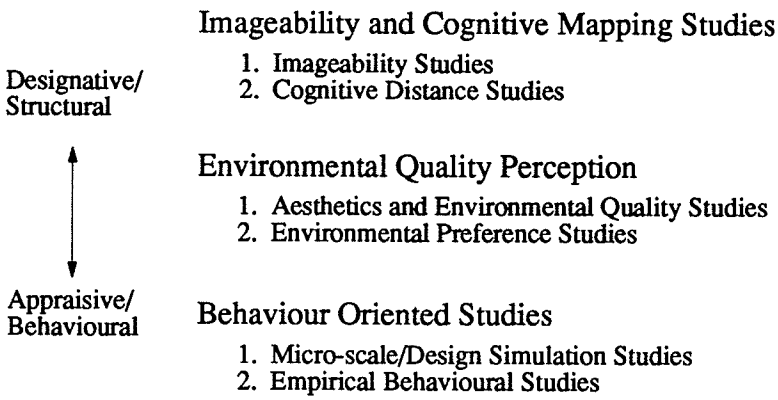
However, this research area has also been the target of much criticism as a result of its seemingly deterministic orientation (Gold, 1980). In an early defense of cognitive behavioural research, Lee (1971) argued that ". . . the main misunderstanding arises when critics attribute to architectural determinists the absurd claim that the built environment is the *only* or even the *main* agent in the formation of behaviour" (p. 255-256). To the contrary, it has been demonstrated by many researchers that the role of the physical environment in defining human behaviour is small when compared to social and cultural influences (Gold, 1980). More as a realization of this fact than as a consequence of it, the basic assumption made by these researchers has historically been that the physical environment provides the context or setting within which social and cultural behaviour occurs (Appleyard, 1979; Genereux, Ward, & Russell, 1983; Gold, 1980; Lynch, 1960, 1971; Stea, 1985; Tzamir, 1979; plus others). This position has eliminated a great number of the obstacles to research on design-related issues making it a viable area for investigation in a behavioural context. The present chapter is intended to review and discuss the implications of this behavioural research for the practice of urban design.

4.1 Implications of cognitive behavioural research for urban design

This chapter acknowledges the seminal influence of Kevin Lynch's, The Image of the City (1960) in accordance with other cognitive behavioural researchers. His concepts of *imageability* and *urban legibility* have become important factors upon which much of the subsequent research has been conducted. The practical assumption has been that changes to the physical structure of the urban environment are accompanied by a corresponding alteration in the psychological and social impacts of the area for its inhabitants as a result of the urban design process (Collyer et al., 1983). For this reason, the relevant body of behavioural research has isolated the relationship between human psychological and social

development with respect to the urban environment.

Figure 4.1 - The structure of cognitive behavioural research as it relates to urban design.



Source: After Duncan (1987), Rappoport (1977), and Smith (1988).

The cognitive behavioural research which is relevant to the practice of urban design can be grouped loosely into three categories as shown in Figure 4.1. Especially important with respect to this organizational perspective is the differentiation between *designative* and *appraisive* cognition (Smith, 1988). Designative cognition studies focus on the acquisition, structuring, and storage of information about urban environments. On the other hand, those studies which concentrate on human behaviour as a derivative of evaluative and affective judgements about environmental information can be classed as appraisive (Duncan, 1987; Smith, 1988). From this perspective, the literature has been grouped at various points on a continuum which views these designative and appraisive cognition studies as polar realities.[1] The significant findings of each of these categories will be discussed in the following sections.

4.1.1 Imageability and cognitive mapping studies

The distinguishing characteristic of this group of studies is its emphasis on the organization of the macrostructural features of the cognitive *image* as an active psycho-spatial

representation of the environment (Tzamir, 1979). Typically, respondent groupings consist of samples from relatively homogeneous populations (i.e. students, consumers,...). The subjects are often asked to identify the key elements of their urban image as elicited by a variety of response formats. Of these techniques, the sketch map and ratio-scaled estimate have been applied very widely. Individual results are usually aggregated into a single map representing the public image of specific areas within the city. Although specific design alternatives are not usually analyzed in these studies, they provide techniques for uncovering the urban image and evaluating its accuracy with respect to distance estimation, orientation, and aesthetic compatibility. The relevant literature can be divided into two groups. The first is associated with legibility and cognitive mapping and the second concentrates on cognitive distance estimation.

4.1.1.1 Imageability, legibility, and cognitive mapping

The influence of Kevin Lynch's (1960) concepts of imageability and urban legibility has been the most significant in this area. Recall that imageability is that quality in an object which gives it a high probability of evoking a strong image in any given observer, while legibility refers to the ease with which elements can be organized into a coherent and usable mental representation or "map" (Lynch, 1960). The challenge for designers has been to find that combination of physical and structural elements which improve urban legibility and to incorporate them into their designs.

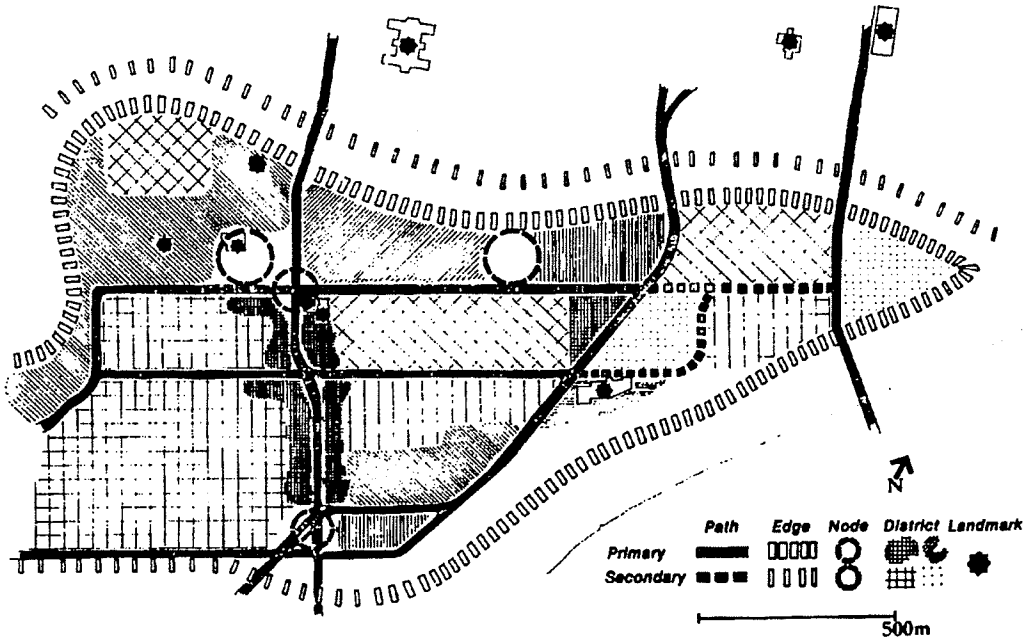
Towards this aim many researchers have concentrated on identifying the physical qualities which help make features of the urban landscape imageable. Here, Lynch (1960) proposed ten formal qualities which contribute to an object's overall imageability – *singularity, simplicity, continuity, dominance, clarity of association, directional differentiation, visual scope or scale, motion awareness, temporal linkages*, and *cultural meaning*. Donald Appleyard (1969) supported the reliability of these criterion for predicting the imageability of public buildings in his own study of Ciudad, Guyana. Furthermore, he demonstrated

effectively using a stepwise regression technique that high visibility alone is not as important as the cultural significance or the daily use of a building are for improving its imageability. Using Appleyard"s analysis technique, Evans, Smith, and Pezdek (1982) also concluded that a building's size, visibility, form, singularity and user activity levels are important qualities which contribute to its recognition by the general population.

Even though the formal qualities which contribute to an object's imageability are universally effective, it has been shown that they are differentially emphasized between urban areas and cultures (Briggs, 1973; Evans et al., 1982). Similarly, it has been shown that the elderly as a group, rely more on the historical and cultural significance of landmarks for identifying them in a free recall task than do other age cohorts (Evans et al., 1982). These conclusions indicate the importance of cultural and generational differences in image construction. Reflecting this fact, Cats-Baril and Gibson (1987) have incorporated a system into their multi-attribute *Aesthetic Impact Model* (AIM) which would account for cultural differences by weighting formal qualities affecting imageability and overall appearance with site-specific weights. Other factors influencing imageability which have been identified include the shape of the site, land-use, massing of buildings, building surface and architectural aesthetics (Kadury, 1979) and views, to and from the site (Caminos, et al., 1980).

With respect to urban legibility, most research has concentrated on the organization of the macrostructural image elements identified by Lynch as *paths, edges, districts, nodes, and landmarks* (1960, p. 47-48). These concepts are firmly entrenched in the professional practice of urban design as evidenced by an examination of any number of recent urban design proposals (See Figure 4.2). In addition, a number of studies have focused on the mental processes which relate these various image elements to each other. Tzamir (1979) has identified three common types of image organization – serial or sequential, spatial, and anchoring. The basic difference between these organizational structures is linked to the underlying cognitive processes that are employed for encoding and storing spatial information. There is some evidence that design proposals which have well-developed visual

Figure 4.2 - Macrostructural analysis of the Fort Rouge neighbourhood in Winnipeg, Manitoba which employs Lynch's concepts of path, edge, district, node, and landmark.



Source: Asad et al. (1984, p. 22).

linkages that address these perceptual processes create consistently more viable commercial and social environments, while isolated developments have proven less successful (Hesselgren, 1974; Bacon, 1985).

4.1.1.2 Cognitive distance studies

Research focused on cognitive distance estimation has concentrated on the accuracy and development of the cognitive image. It is related to urban design by the assumption that changes in the physical design of the city effect an individual's ability to function in it by disrupting his or her established cognitive image. The most relevant contributions of this research area reflect this bias by investigating the relationship between objective real-world distances and the cognitive distance estimate. Other research has investigated the effects of route structure on distance estimation.

A general trend to overestimation of objective distances has been uncovered by a number

of researchers (Canter & Tagg, 1975; Coshall, 1985; Ferguson, 1979; Lee, 1970; Matthews, 1981; Matthews, 1987; Spencer & Weetman, 1981; Thompson, 1963). Antes, McBride, and John (1988) have even estimated the error rate for these subjective distances to be as high as 45%. Some support has been found for several variables which positively influence the accuracy of the distance estimate including the *valence* of the intended destination (Ferguson, 1979; Lee, 1970; Thompson, 1963), *age* (Brown & Broadway, 1981; Matthews, 1981; Matthews, 1986), *availability of information*, *social status*, *time pressure* (Coshall, 1985), and *individual mobility* (Brown & Broadway, 1981). Many research studies have shown that cognitive ability develops quickly and increases at a decreasing rate over time (Ferguson, 1979; Kirasic, Allen, & Siegel, 1984; Lee, 1970; Moeser, 1988; Spencer & Weetman, 1981; Thompson, 1963). In light of these findings, it is surprising that Antes et al. (1988) have found little correlation between length of residence and improvements in cognitive ability when a new traffic route was introduced to Grand Forks, ND.

There is some research which indicates that differences in cognitive ability exist between the sexes (Antes et al., 1988; Brown & Broadway, 1981; Matthews, 1986; Spencer & Weetman, 1981). Given the results of research conducted by Spencer and Weetman (1981) and Antes et al. (1988), it is likely that these differences are a result of differential map storage techniques. Both studies indicated that females seem to employ more sequential imagery, placing little emphasis on landmarks, than did males who employed spatial/abstract mapping techniques. Matthews (1986) attributes the differences in the quantity and quality of spatial information by children to be a result of structural causes related to child care and home range limits. In a similar way, Foley and Cohen (1984) showed that all individuals employ various mapping strategies according to the difficulty of the task in micro-scale architectural environments.

In another study, Lloyd and Heivly (1987) used ratio scaling techniques to test for systematic distortions in cognitive maps. They found that home location effects the accuracy of distance estimates according to both coding and rotational heuristics. These findings were

confirmed by Kirasic et al. (1984). They also concluded that although cognitive maps become more abstract and flexible with experience, more often the observed error can be attributed to systematic distortions made consistently by the respondent.

The structure of a travel route has been shown to influence distance estimates to varying degrees. Sadalla and Staplin (1980) found support for their *Route Segmentation Hypothesis* and *Information Storage Models* in a laboratory simulation. By using a complex segmented linear system to duplicate a real world urban street network, it was shown that respondents consistently used the available route structure as a mechanism for information storage and organization. Lee (1970) and Briggs (1973) also found different degrees of evidence to support the hypothesis that complex route structures effect the accuracy of cognitive distance estimates. Perhaps, the most convincing replication of these findings is the study conducted by Canter and Tagg (1975) in Tokyo, Glasgow, and Sydney. They effectively showed using a multi-dimensional scaling technique that the influence which transit route structures and natural land features had on the cognitive image was to lengthen distance estimates and distort them towards known travel routes. Since, this was an observed phenomenon in each of the study cities, it seems to support the universality of this finding across cultures.

4.1.2 Environmental quality studies

The distinctive feature of this research grouping is its concentration on the affective qualities of the urban environment. Especially important are the evaluative ratings obtained from homogeneous respondent populations about particular urban areas or environmental conditions. These ratings are obtained by isolating the effects of a single element or environmental quality on the observer. To accomplish this task, some form of environmental simulation is often implemented using a combination of photographs, slides, and audio recordings. This research can be divided into two subgroups – aesthetics and environmental quality studies and environmental preference studies.

4.1.2.1 Aesthetics and environmental quality studies

The investigation of environmental quality and aesthetics is important to the practice of urban design for four reasons. First, aesthetics as well as other perceivable characteristics are associated with imageability (Evans et al., 1982). Second, the purpose of design is to achieve specific goals in which the perception of environmental quality plays an important role. Third, urban design (as are all design fields) is concerned with the visual appearance and attractiveness of the environment. Finally, there is a growing need for assessment methods which can evaluate the effects of design and development proposals on the surrounding urban environment. Given this rationale, researchers have tended to concentrate on environmental quality assessment. The goal of this research has been to throw light onto particular alternatives which can be used to achieve specific design objectives (Im, 1984).

Employing assumptions similar to Hesselgren's (1979) "outdoor room" concept of urban planning, a few researchers have independently investigated the perception of enclosure at the urban scale. Using a sample of paid university students to rate slide scenes of a university campus, Im (1984) employed a regression procedure to show that enclosure is related positively to ground slope, canopy ratio, and the amount of vegetation in the scene. In the same study, enclosure was negatively associated with the height ratio of the enclosing buildings and the amount of open space on the perimeter of the scene. Similarly, Thiel, Harrison, and Alden (1986) using slides of artificial horizon perspectives showed that although enclosure is determined by all five surfaces establishing the space, it is the overhead surface which has the most dominant enclosing nature. There is some evidence to support these claims using slides of nature scenes (Herzog & Smith, 1988). In light of these results, it is logical that Smardon (1985) cites the site enclosing quality of the urban forest to be one of its most relevant architectural applications. Finally, Yamada et al. (1986) used a multidimensional scaling technique to identify ten unique streetscapes which have different land-use intensities to access the susceptibility of the respective street scenes to the visual intrusion of an automated sky way and station. The results showed that streetscape type is

the determinant effecting the magnitude of the specific visual intrusion. As expected, warehouse and by-pass scenes are not significantly impacted by these structures and are therefore more suitable for their location.

There is further evidence to suggest that the perception of mystery and danger reduces preference scores for all environments. For example, Herzog and Smith (1988) demonstrated that environments having high mystery and low danger are positively related to environmental preference, while high danger areas are negatively related to preference. Using similar techniques, Shaffer and Anderson (1983) demonstrated that 22% of the perception of security in parking lots is explained by environmental attractiveness. The absence of poles, wires and automobiles also improved preference scores. Furthermore, using factor analysis techniques, it was determined that physical design accounted for 80% of the variation in attractiveness scores. Shaffer and Anderson also identified a factor which explained 62% of variance in security scores. This study also supports findings that relate the presence of vegetation with stronger feelings of security and higher aesthetic preference (Smardon, 1988).

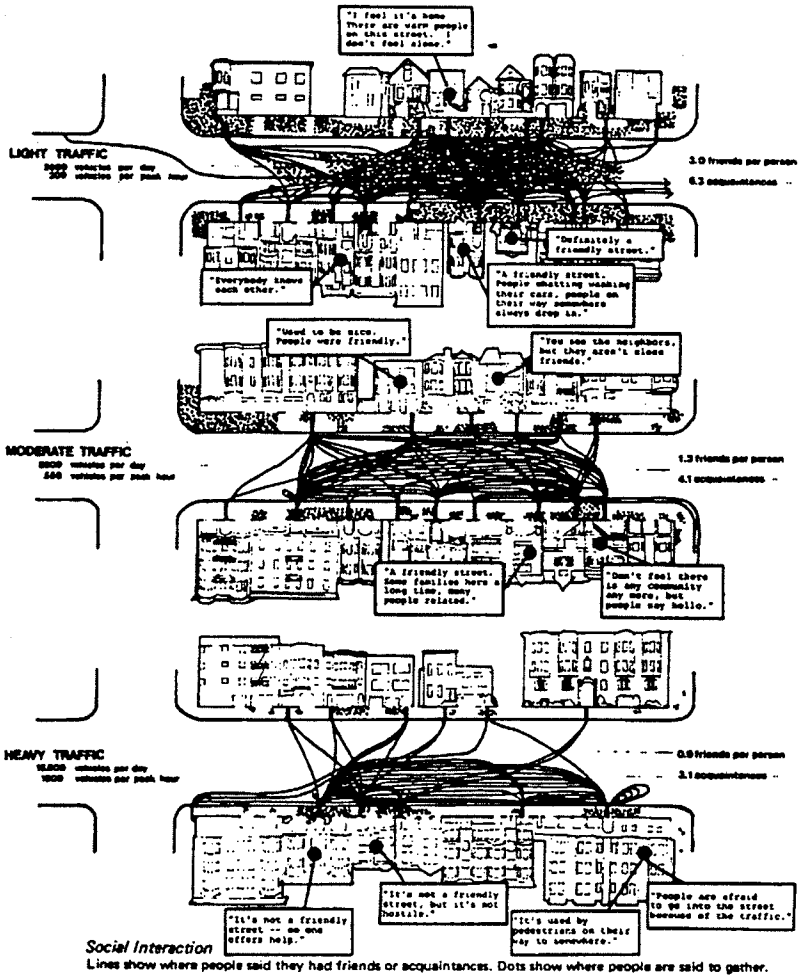
As previously mentioned, an interesting application of these findings is the Aesthetic Impact Model (Cats-Baril & Gibson, 1986, 1987). By separating the components of aesthetic preference into components of a weighted aggregate index, this model can be used as a systematic method to facilitate discussion about design projects and to perform "what-if" analyses (Cats-Baril & Gibson, 1987).

4.1.2.2 Environmental preference studies

Environmental preference studies indicate which physical design factors are viewed to contribute significantly to richer community life and appreciation. Much of the relevant work replicates aspects of research that was undertaken by Appleyard and Lintel (1972) in San Francisco. By selecting three adjacent city blocks with fairly homogeneous populations, architectural features, and markedly different traffic volumes, they hoped to show the effects

of traffic on residential quality (See Figure 4.3). Using data from resident interviews, it was found that residents of the high traffic street felt that the street itself was a barrier to communication, created a poor living environment, and had little appeal for family life. In

Figure 4.3 - Appleyard and Lintel (1972) clearly demonstrated the relationship between residential satisfaction and the environmental characteristics of different street environments. Here the relative levels of social interaction are shown for light, moderate, and heavy traffic areas.



Source: Appleyard and Lintel (1972, p. 92).

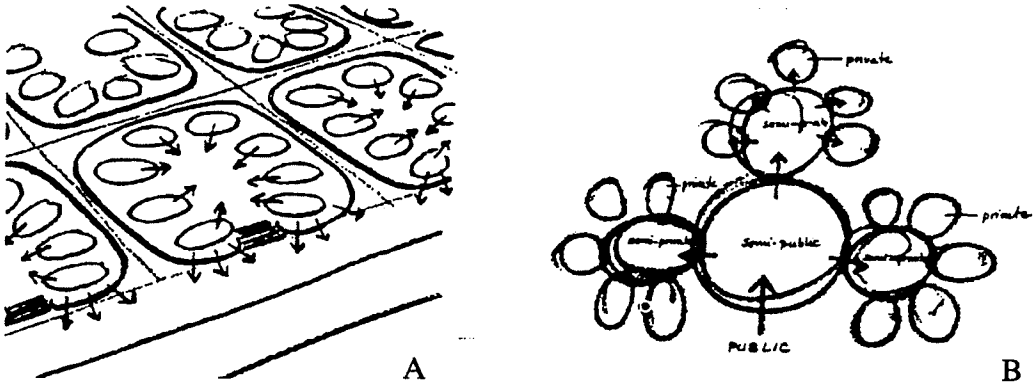
contrast, streets with moderate and low traffic volumes were represented by higher levels of social contact, greater levels of satisfaction, and improved legibility in direct proportion to their respective traffic flow levels. On the basis of these results, the researchers concluded

that individuals find a residential environment satisfactory when its available amenable characteristics match the relative importance that they would attach to them independently.

In a related study, Nasar (1981) investigated the visual preference of the elderly by utilizing eighteen bipolar rating scales to ascertain security scores for various public housing environments. He concluded that preference scores for the elderly could be predicted by the absence of mystery caused by visible physical services and by the presence of well-kept, uniform environments. These results contrast those found for samples more representative of the general population by Savasdisara (1988). His study of Japanese residential neighbourhoods identified seven factors explaining 61% of the observed variance in environmental preference scores. These factors can be described as: 1) safety and security, 2) accessibility, 3) environment, 4) parking facilities, 5) roads and sidewalks, 6) residency, and 7) building use. Furthermore, Zube, Vinning, Law, and Bechtel (1985) in a cross cultural study of Arab and American residential neighbourhoods found evidence for differences in preference ratings between cultural groups by using slides and sound tape recordings to duplicate environmental stimuli.

An interesting application of this research to the practice of urban design is Oscar Newman's, Defensible Space (1972). Using case studies from various cities and numerous public housing developments, Newman has developed a concerted plan for developing urban environments using the perception of user-safety as a guideline. He effectively demonstrated that recognizing human territoriality, providing opportunities for natural surveillance to occur, and enhancing the image and milieu of residential environments strengthened their desirability and overall safety. As shown in Figure 4.4, he advocated the development of *resident defensible spaces* that clearly make the transition from public to semi-public to semi-private and finally private spatial environments. In real terms, Newman's research provides an unchallenged justification for claims made by other writers such as Jacobs (1961) that the stability of urban neighbourhoods is directly related to their physical design.

Figure 4.4 - The principle of defensible space as it was developed by Oscar Newman (1972). Schematically, environments should be structured to provide territorial definition with opportunities for surveillance (A) in addition to a natural hierarchy of spaces moving from the public to private domain (B).



A B

Source: Newman (1972, p. 9).

4.1.3 Empirical behavioural and design simulation studies

Clearly the implications for the practice of urban design are well developed in this area of research. By observing user levels and activity patterns within specified physical environments, conclusions are drawn about the effects of the physical environment and design on behaviour. Subject samples are most often drawn from the naturally occurring user populations. For the purposes of this section, a division is made between those studies emphasizing micro-scale/architectural space and those emphasizing observed behavioural patterns in general.

4.1.3.1 Micro-scale design simulation studies

The potential for design simulation studies to provide insight into macro-scale design issues has been largely untapped. Instead, much research has been focused on the conscious manipulation of micro-scale and architectural environments. Still, the implications of these studies throw considerable light on possible study areas and techniques for further research on urban design issues. Two of these studies will be considered in detail.

Duffy, Bailey, Beck, and Barker (1986), used a survey technique to test the preferred

design characteristics of an elderly personal care home by its residents, administrators, and a group of design students. The results clearly showed that discrepancies in what was considered the preferential layout varied between subject groupings. Specifically, designers and administrators as a group consistently selected furniture arrangements and layouts which were sociopetal while residents preferred sociofugal designs.[2] This points to the obvious disparity that exists between user interests and administrators. As a policy suggestion, it was recommended that increased user participation be considered in future design projects.

In another elderly aggregate housing study, Kinney, Paris-Stephens, and Mcneer-Brockman (1987) investigated territorial behaviour in groups of ambulatory, movement assisted, and less alert elderly patients. Respondents were asked to list activities which they felt were appropriate for specific areas in the housing complex. As hypothesized, all groupings were more territorial in private areas. However, the movement assisted category, being less able to perform certain functions independently, were considerably less territorial in private spaces than the other groups. The less alert elderly grouping was more territorial in semi-public and public spaces than both groupings. These findings implicate the importance of considering user mobility and competence when developing design proposals.

Office design has also been considered by researchers (Becker, Gield, Gayln, & Shyer, 1983; Stea, 1965). In their study of faculty offices in community colleges, Becker et al. (1983), demonstrated that open office plans were less well preferred than either closed-private or closed-shared designs. It was felt that open designs were more distracting and offered little privacy as compared to other layouts. Similar results were found in Ahrentzen and Evans' (1984) exploration of classroom design and student distraction. It was concluded that although teachers preferred open classroom designs, they felt they were more distracting. Students associated the open classrooms with negative satisfaction and preferred higher ceilings and more structural walls. In any case, classrooms with fewer structural walls were shown to have higher rates of adaptive behaviour to create private spaces and activity areas.

Research has also been conducted into the area of user requirements and housing design.

For example, using a lifescale three-dimensional simulation laboratory Lawrence (1982a, 1982b, 1985) showed that the selection of a future housing design is influenced by two sources – sociocultural influences and personal experience. Especially important in this aspect was the recollection of the parental home. Mueller (1981) however, has shown using a multi-dimensional scaling approach that activity and lifestyle related design instructions have little influence on the resulting house design. Instead, the designer relies on an assumptive process to produce housing designs with similar underlying "autonomic prestructures" (Mueller, 1981). Similar results have been demonstrated at larger scales using computer simulation and modelling routines (Hillier & Hanson, 1979; Hillier, 1985).

An interesting departure from these studies concerned with architectural space is Brown and Burger's (1984) study of playground design and preschool play behaviour. By using an observational technique in both traditional and contemporary playgrounds, they demonstrated that little difference in play behaviour could be attributed to differences in playground type. Rather, the importance of providing a system of zoning, space encapsulation, and a variety of play surfaces including riding areas is important to the construction of successful play areas.

4.1.3.2 Empirical behavioural studies

Empirical behavioural research focuses on the measurement and explanation of behaviour in existing physical environments. This research has been effectively conducted at the architectural and urban scales. For example, Campbell and Campbell (1988) have shown using college faculty lounges that physical design and layout is more useful for predicting user levels than user attitude or department size. Specifically, factor analysis revealed that three factors explain most of the variance in user activity levels. These factors are: 1) the presence of comfortable seating, 2) the presence of office machines and, 3) the location of food preparation facilities. The Campbells also concluded that activity levels are related to the degree in which the physical environment supports naturally occurring behavior.

At a larger scale, evidence has been found that street design influences territorial and community behaviour (Brown & Werner, 1985). Using holiday decorations as a measure of territoriality and community commitment, Brown and Werner (1985) showed that cul-de-sacs are characterized by higher degrees of identity and a greater sense of place than through streets. It was demonstrated that block attachment, social interaction, and community security are facilitated by the opportunities for close contact that are afforded by the cul-de-sac design. This is a logical finding given the findings of Newman (1972) as described in a previous section.

Jaakson's (1986) study represents a simple application of behaviorally based urban design research techniques to develop a recreation policy for Toronto. Jaakson discovered using survey questionnaires that the use of recreational facilities varied between the populations of particular housing types. Furthermore, using t-tests it was shown that variations in household status, a factor highly correlated with housing type, affects the demand for recreation infrastructure. Not surprisingly, small or single person households had a higher demand for recreational facilities than larger households or families. As a result, recommendations were made to change facility distribution procedures in order to increase the number of recreation facilities which were provided in high density apartment areas.

Designers have also actively participated in this area of cognitive behavioural research. For example, Marcus and Sarkissian (1986) have developed a comprehensive design guidelines manual for housing developments which is based on user input and behavioural studies. Similarly, Jan Gehl (1987) has developed an approach to design based on a clear recognition of the *life between buildings*. He directs the attention of designers to the supportive role which street environments must play in accommodating human behaviour. Effectively, Gehl's research challenges designers to recognize the impacts of their design prior to its implementation and to improve inadequacies by addressing the ways in which urban spaces are actually utilized. This is the same position that has been developed by Whyte (1980) in his analysis of the use of urban plazas and their relationship to the street. He

concluded that the use of an urban space is directly correlated with the provision of ample seating, a recognition of year-round environmental conditions, and proximity to concentrations of other activity and the selling of food. These findings have been supported by research efforts in other cities (Linday, 1978).

4.2 Synthesis: Urban design for human diversity

The preceding section has explored some of the findings of cognitive behavioural research which are relevant to the field of urban design. Those studies which have investigated the structure of the cognitive urban image have underlined the connection between the macrostructural form of the urban environment and human behaviour. With varying degrees of success, they have also isolated a number of specific formal qualities and relationships that effect the development of the urban image and which could theoretically be manipulated through design. This research has provided planners with a larger set of urban design "tools" that are based on human cognitive abilities. In contrast, research projects which have emphasized human spatial behaviour are significant since they have demonstrated the critical importance of the physical context within which all behaviour occurs. Perhaps the most important conclusion reached in this area is that a well-designed physical environment affords a wide range of behaviours. Finally, that research which has investigated environmental quality and the development of environmental preferences has helped to show how the contextual parameters of human behaviour and development can be developed through urban design.

Still, this research is not without its limitations. Clearly, much work is required to improve the adaptability of behavioral research to formats which are useful to the urban designer (Bunting & Guelke, 1979; Purcell & Heath, 1982; Seidel, 1981; Weidemann, 1989). This is understandable since most of the existing cognitive behavioral research relies on rigorous analytical and statistical procedures that are not easily employed or comprehended by those unfamiliar with behavioral research techniques. As well, the lack of clarity in many

of these findings is further eroded by the wide-ranging application of similar terminologies throughout the literature.

A more significant limitation, perhaps, is the sentiment which exists that design can never be achieved successfully by integrating scientific or research-based findings. In fact, it seems that designers will continue to view design as a subjective process in which creative effort is the only essential ingredient (Lang, 1988). This is a weak argument given that many behavioural research techniques are readily incorporated into design proposals at many levels where these results are matched to project requirements or familiar to the designer (Purcell & Heath, 1982; Seidel, 1981). This indicates that design professionals need refinements in behavioural design techniques to improve the adaptability of important findings while designing (Lang, 1988; Tzamir & Churchman, 1984) and additional evidence that supports the continued use of research-based design (Bacon, 1985; Cats-Baril & Gibson, 1987; Gold, 1980; Hodge, 1986) if this trend is to continue.

Finally, the cognitive behavioural research perspective is subject to the traditional criticisms of all socially-oriented research. Respondent groupings are usually not representative of the general population and the individual is often viewed as an atomistic, independent actor (Duncan, 1987). Similarly, more than in any other category of behavioural research, the research on urban design is based on constructivist philosophies of perception (Aitken & Bjorklund, 1988). As a result, it has been suggested that future research should enter a new age which places emphasis on the dynamic qualities of human behaviour by investigating person/environment change (Aitken & Bjorklund, 1988; McMillan, 1979). This position is easily justified with respect to design-oriented research since much is known about the structure of the urban image, but relatively little is understood about how this image influences behaviour, if at all.

Despite these criticisms, the significant finding is that behavioral research complements the demands of sound architectural and aesthetic theory. Furthermore, it points to the fact that urban design could go beyond what has been traditionally considered necessary to support

the requirements of the social and psychological development of the urban population. It was in this sense that Lynch believed that it should be possible through behavioural research and urban design to reinforce the meaning of the urban environment and thus create "...a landscape technically organized so that its part work together, but, perceptually coherent as well, whose image is congruent with life and action" (1971, p.15). This approach seemingly directs urban design more closely to its true level of interpretation than can be accomplished by developing design proposals solely on the basis of their aesthetic fit with the surrounding environment. A behavioral approach to urban design is more concerned with how the proposed environment will be used than on how it will look. In fact, it is predicated on diversity, human behavioural requirements, and the development of supportive social, psychological, and cultural environments.

4.3 Chapter summary

This chapter has examined the relationship between urban design and some of the relevant behavioural research conducted in the social science and design fields. Two important conclusions were made. First, it is clear that there is a connection between behavioural research and the practice of urban design. In specific terms, the underlying research objective in this area has been to investigate the strength of the association between the physical environment and human behaviour. This theme has been developed into three specific areas concentrating on the perception of the urban environment, affective evaluations and preference development, and the relationship between spatial behaviour and the physical structure of the environment, respectively. Qualitatively, this research has underlined the potential significance of particular formal characteristics and spatial relationships on the development and definition of supportive human environments through urban design intervention.

The second finding is that behavioural research complements the existing body of architectural and design theory. This is easily demonstrated since much of the relevant

behavioural research is centered on key themes that have been identified in the previous chapter. For example, there is a strong intuitive connection between the development of a highly connected urban image and the provision of a well-structured environment from the perspective of linkage theory. Similarly, the elimination of perceived sources of danger and unattractive visual environments improves the qualities of a neighbourhood and aids in its transformation to a meaningful place. In contrast, it is significant that few designers have easily incorporated the findings of behavioural research into effective techniques for practice. This indicates that alternative approaches which match the findings of this research with the expectations of designers are lacking and should be developed.

Notes

[1]This has been done solely for organizational purposes. It should be noted at this point that considerable variation and overlap, both within and among categories, does occur.

[2]Sociopetal designs work to bring residents into close contact while sociofugal designs allow for less forced interaction. Typical design interventions which are representative of these two types of arrangement are fixed or open seating plans, respectively.

CHAPTER FIVE

THE NATURAL WORLD

"Our eyes do not divide us from the world, but unite us with it. Let this be known to be true. Let us then abandon the simplicity of separation and give unity its due. Let us abandon the self-mutilation which has been our way and give expression to the potential harmony of man-nature. The world is abundant, we require only a deference born of understanding to fulfill man's promise. Man is that uniquely conscious creature who can perceive and express. He must become the steward of the biosphere. To do this he must design with nature."

– Ian McHarg, 1969

The resentment that is increasingly being directed at the traditional processes of city planning has many intrinsic origins. The observation that daily newspaper editorials are constantly occupied with a range of issues including the possible consequences of municipal development by-law amendments, new facility locational decisions, and alleged improprieties in the subdivision approval process is symptomatic of this situation. It is significant, however, that recent considerations have turned more often to the cumulative impacts of urban development on the natural environment. Specifically, the problems which are attributed to this process (i.e. pollution, urban sprawl, congestion,...) are seen as end products that are incongruous with the life sustaining capabilities of the physical world. Consequently, many writers have restated the objectives of urban development along these lines. For them, the critical challenge is to create an urban environment that respects the important role played by ecological processes, climatic patterns, and other natural phenomena. In fact, proponents of this position often move much beyond this *real concern* for the natural environment to a concerted interest in human development and the societal impacts of development in the post-industrial world. Viewed from this perspective, the relationship between the natural environment and the development of urban areas deserves considerable attention as a

motivating influence to the practice of urban design.

The purpose of this chapter is to explore some of the relevant contributions that have been made by the fields of urban planning, landscape architecture, and the natural sciences to this emerging ecological perspective. The central focus will be on the impact of this research on the contemporary urban design practice.[1] As a means of accomplishing this task, the answers to the following questions will be explored – "What is the relationship between the natural physical environment and urban design?"; "How does an ecological approach to urban design differ from other techniques or strategies?"; and, "What are the relevant contributions of this perspective to urban design practice?". It is intended that this approach will highlight the important themes and foundations upon which this ecological perspective is based. These findings are further evaluated to uncover the potential that exists for using the design process as a major contributor to the ecological development of urban areas.

5.1 Urban ecology as a philosophical position

Before proceeding with the following discussion, it is necessary to understand what is implied by the term ecology. Literally translated, ecology refers to the study of the *home* as derived from the Greek word *oîkos*. In common usage, however, the word has two distinctive, yet related, meanings. The form which is most widely understood reflects a concern for the interactions of organisms and their respective environments. Here the focus of study is on natural systems and biological processes. In contrast, the less well known usage refers to *social ecology*. That is the spatial organization of society caused by its various structuring mechanisms (McGahan, 1986, p. 25). The critical objects of observation from this perspective are the processes of social interaction which result in identifiable spatial distributions of people in the environment. For the purposes of this chapter, ecology will be defined as the integral association of both common usages reflecting a more objective science of the "home" (Carmi, 1979; McHarg, 1969).

It is significant to note, however, that the ecological perspective is grounded in the

conflict between human beings and the physical environment. It is pervaded by the sense of urgency that has as its source the impending confrontation of the life supporting capabilities of the natural environment and the competing goals of many communities for development. Murray Bookchin (1980) expresses this problem succinctly, "The essence of the ecological crisis in our time is that this society – more than any other in the past – is literally undoing the work of organic evolution" (p. 36). Reflecting this fact, the traditional processes of urban planning have done little to improve the relationship between cities and the surrounding environment. It may even be argued that they have worked to erode the life sustaining abilities of many urban areas by promoting directed, but uncontrolled growth, at a never before experienced scale and pace.

Bookchin writes,

> "City planning today lives within the tension of an historic contradiction: the idealization of urbanity as the *summum bonum* of social life and the crass realities of urban decay. In theory, at least, the city is revered as the authentic domain of culture, the strictly man-made social substance from which humanity fashions the essential achievements of consolidation. Caught in the contradiction between ideal and real, city planning emerges not merely as ideology but as myth. The myth originates in the very term 'city planning', in the nomenclature and pedigree which the seeming discipline appropriates for itself. Juxtaposed to the megalopolis, to the formless urbanity that sprawls across the land and devours it, the word 'city' has already become euphemism, and erstwhile reality digested by what Lewis Mumford so justly calls the 'anti-city'...Accordingly, city planning reduces all that is vital in the traditional city, including the ideal itself, to a deadening caricature – the megalopolis as 'city', the noncity as the representation of its very anti-thesis" (1980, p. 135-136).

The fundamental problem is that the traditional planning process has been directed at treating urban problems as opposed to eliminating their root causes. It has been objectified as a method for preventing difficulties, and yet, it works to preserve the system which creates

them. With respect to urban design, the physical plan has been substituted for an integrally different approach that is based on the integrity of the naturally occurring physical and social processes in the community. The city has come to be seen as an abstracted design isolate – an archaeological artifact – with its own internal logistics and parameters of construction that qualitatively abrogate nature and human social life.

Ideologically, the ecological imperative proposes a much different position. Hough (1984) outlines four primary characteristics that differentiate it from the traditional planning perspective. First, ecological planning promotes a reintegration of urban society with environmental values and a realignment of cultural connections with the land. Design is to be more highly connected with the natural processes and ecological conditions that have already worked to shape the city. Second, there is a reconsideration of what factors are truly considered urban resources. The reference here is made to the promotion of natural open spaces, grasslands, and water bodies that contribute to the overall environmental quality of the urban environment. Similarly, there is a reconsideration of traditional aesthetic values and design doctrine in favour of restored natural habitat and vegetation systems. Finally, the ecological perspective promotes significantly different environmental values and perceptions of the environment. From this perspective, ecology is more than mere environmentalism since it views the integrity of the environment as an end in itself. Natural diversity is viewed as a valuable and necessary component of the environment which improves the stability of the ecosystem and enhances the meaningfulness of life.

Stanford Anderson (1986b) extends this natural ecological concept to the societal and cultural level. His position unites the environmental aspects of the ecological perspective with the purposive qualities of human behaviour thereby creating a more stable basis for planning and design. In his own terms, individuals should be recognized as "unique, volitional, and cultural beings" that contribute to the ecology of a given area (p. 2). Ecology, therefore, is best understood as an operating mechanism of natural *and* social organization as opposed to a socially differentiating or environmentally directed field of study. From this

perspective, the best possible future for urban areas can be interpreted as the sensitive development of a meaningful human-scale. *Meaningfulness* in this sense reflects the limits of the natural living environment to support *and* sustain the developing urban area (Bookchin, 1980; Lynch and Hack, 1984; McHarg, 1969). Intellectually, this elevates urban design from a static resolution of formal characteristics to a dynamic process of adjustment and adaptation reflecting the requirements of society (Todd & Todd, 1984; 1990). In this purest sense, ecological urban design can be classified as a *social work of art* (Bookchin, 1980).

Thematically, there are two concepts reflected in these classifications that require further elaboration as tenets of ecological philosophy. The first is the notion of sustainability. Sustainable development has been defined by the Brundtland Commission (1987) as development which meets the needs of the present without compromising the ability of future generations to meet their own needs (cited in McKendry-Smith, 1989). Inherent in this definition is an intangible sense of limits to growth beyond which the potential for undertaking a specific activity at the present levels is greatly reduced. This is clearly a different basis for planning practice than are the traditional concepts of optimality and efficiency (Daly, 1989). The implications for urban design on this basis are as yet not well understood.

The second notion is tied to the view that urban areas should be viewed as a part of a complex ecologically delimited zone or *bioregion* (Andruss, 1990; Bookchin, 1980). From a planning perspective, this is an intriguing concept that works to link geological, hydrological, biological, cultural, social, and perhaps even psychological parameters into a comprehensive organizational framework.[2] With respect to urban design, it points to the integrity of natural systems which sustain the regional identity and underlines the meaningful contributions that are made by local cultures, building styles, and materials. These concepts will be further developed in the next section.

5.2 Principles in action

Both theorists and practitioners have proposed strategies for urban design which integrate natural ecological systems as the basis of alternative planning frameworks. Perhaps the most well known is McHarg's (1969) technique for *designing with nature.* He proposed that the essential pre-cursor to a successful planning exercise is an intimate understanding of the specific operating ecology of a given area. In this light, he developed an attribute-oriented mapping system which works to isolate the intrinsic suitability of an area for specific urban uses by uncovering ecologically compatible attribute groupings.[3] This system allowed him to incorporate natural resources, social needs, and aesthetic values in addition to the usual development criteria with the specific aim of identifying areas for urban development which could create the maximum social benefit and also had the minimum social cost (1969, p. 32).

It also provided a technique for visualizing the consequences of potential policy actions with specific reference to this value-referenced land-use map –

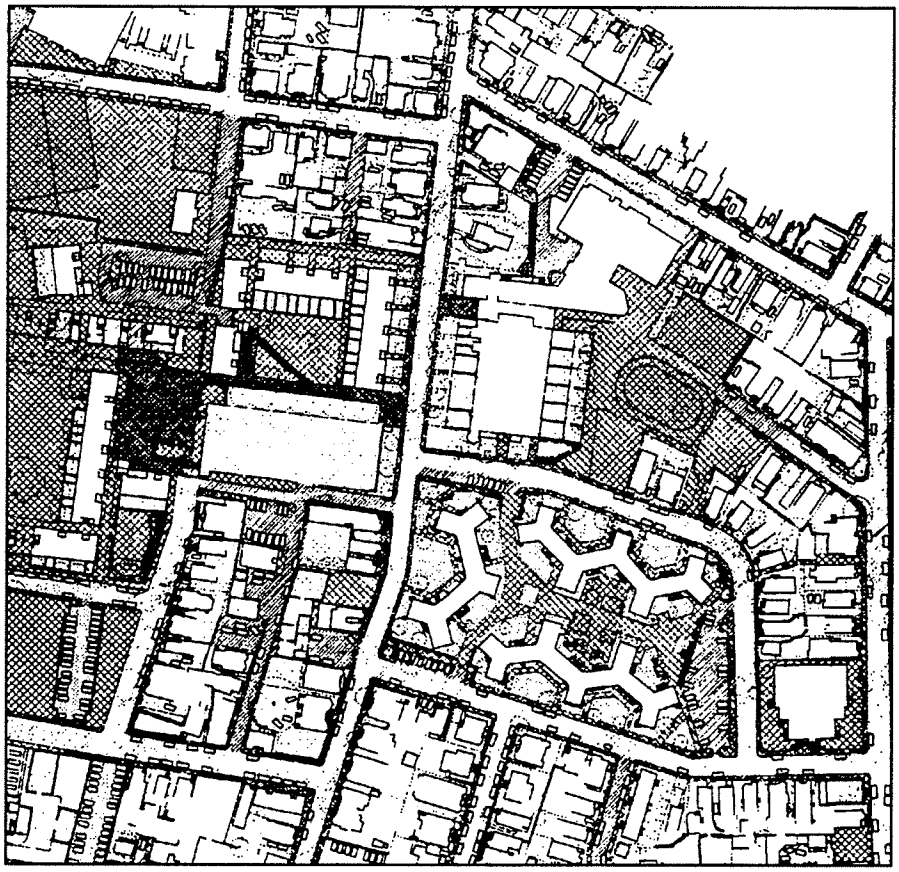
> "...the proposed land-use map is not a plan. It is an expression of physical, social and economic goals. It is the combination of these goals and the public and private powers to realize them that justifies the term 'plan'. Powers must be accumulated as a part of a continuous process of guidance, control, and implementation" (McHarg, 1969, p. 93).

McHarg believed that the critical test of this process was to search for, and adapt urban developmental policies to, the visible ecological parameters which were isolated by his mapping technique. In other words, he sought to "fit" urban design and planning proposals into the existing ecological environment.

A similar approach was employed to delimit the social ecology of a key sector of Paris by Anderson (1986c). His mapping technique expanded upon the figure-ground analysis commonly utilized by urban designers.[4] Specifically, it related three areas of relative spatial interest – public, dwelling, or occupational *claim* – to the physical structure of the street. This resulted in three mappings of the entire study area, each representing a single claim element.

The *public claim map* illustrated those areas in the street which were openly accessible to all inhabitants, while *dwelling* and *occupational claim maps* identified those spaces which were specific to housing residents or business patrons, respectively. At the completion of this step, Anderson then developed a single combined claim map for the entire area which showed the diminishing aspects of each claim value as it was dictated by the location of buildings, pathways, entrances, and open spaces. In other words, areas in the street could be identified which had strong, little, or no relative dwelling claim in contrast to occupational or public claim values (See Figure 5.1). By attaching policy-related weightings to these specific claim elements, Stanford believes that designers could manipulate the social space system by

Figure 5.1 - A map showing the Space of Public Claim for the Riverside area of Cambridge, Massachusetts. Lighter shadings indicate areas of diminished public claim on the street.



Source: Anderson (1986c, p. 302).

interacting with its apparent structure thereby improving the intrinsic suitability of specific design interventions.[5]

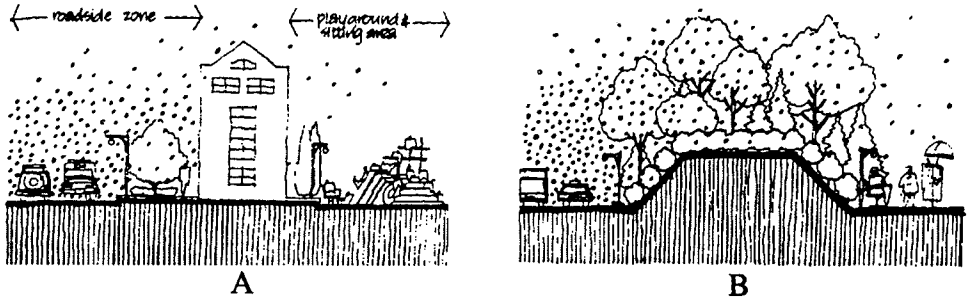
An innovative approach which combines aspects of both of these studies is Carl Steinitz' (1990) evaluation of the visual preferences and ecological integrity of the highway system running through Acadia National Park. In this study, Steinitz utilized a geographical information system (GIS) to effectively evaluate the visual attractiveness of natural landscapes as seen from the roadway. By isolating the integral ecological areas and contrasting them with the visual preference scores of park visitors, it was possible to develop a long range design and development strategy that preserved key ecological sites. In addition, it was possible for designers to develop a more complete understanding of those elements which park visitors found interesting or attractive in order to capitalize on their impacts in future highway design projects.

Ecological principles have also been extended to the urban design process as a determinant of regional identity. Hough (1990) believes that urban design should re-affirm these specific identities by keying on three regional imperatives for design – climate, culture, and a sense of time. Specifically, design schemes should intimately expand our knowledge of a place by elaborating on its identity in the surrounding landscape. Designers should maintain a sense of regional history in addition to providing opportunities for directed experiences and environmental learning. Each of these objectives requires an evaluation of those areas which have a latent or unrealized potential for recapturing this regional identity through purposive intervention. He believes that the active reintegration of these areas into the natural ecological system using alternative management techniques and education will respond to the placelessness of the modern city (Baines, 1990; Hough & Barrett, 1987; Hough, 1990).

In addition to these studies, there is a substantial body of design literature that focuses on the development of specific environmental design techniques. The range of applications in this regard are numerous. Common design-related techniques have been developed for improving access to sunlight (Hedman & Jaszewski, 1984), abating the negative impacts of

environmental winds (Palmer-Benson, 1987), and for preserving important view planes or corridors (von Hausen & Robinson, 1991). For example, Spirn (1984, 1987) has undertaken a thorough investigation of the impacts of urban development, street design, and air quality. By changing the structure of various built environments, she has shown that it is possible to use landscape planting and separation techniques to isolate sources of air pollution from active pedestrian areas (See Figure 5.2). This improves the attractiveness of the area and makes recognizable contributions to the relative air quality of urban spaces. Similarly, Hough (1984) has isolated a number of environmental design techniques which are useful for controlling erosion by reinforcing the natural processes of aquifer recharge and water storage. These techniques enhance the natural character of the specific area and create amenities that positively benefit the surrounding community as well as the environment.

Figure 5.2 - Pollution sensitive uses like playgrounds or plazas can be separated from highway emission zones using appropriate siting techniques (A) and by using landscaping to develop key buffer zones (B).



Source: Spirn (1987, p. 317-318).

A final group of ecological planning literature is concerned with assessing the capacity of natural systems to absorb the cumulative impacts of human activity within acceptable quality standards. As Coyle (1980) has pointed out, this approach forces the planner to undertake a comprehensive analysis of the ecosystem under its normal conditions. A number of procedures have been developed for these purposes including environmental inventories and special area delimitation. Once this information is acquired, it becomes possible to test

various proposed uses using different criterion. While these environmental impact assessment techniques are not specifically design oriented, they do provide a composite understanding of the naturally operating systems and the consequences of urban development for them.

5.3 Synthesis: Urban design for life

It is evident that there is a fundamental relationship between the ecological perspective and urban design planning. This relationship is born out in the substantial interconnectedness of their underlying philosophies of action. It is further evidenced by the fact that design is essentially a process of creating environments. An ecological approach to urban design is qualitatively structured upon a sincere recognition and incorporation of the naturally occurring patterns of social and environmental life. It emphasizes connectedness and a sense of regional identity. Quantitatively, this approach has been extended to a series of inventive design techniques that mitigate against the negative impacts of urban development and which actively promote sensitivity within the planning framework. These techniques search out and build upon the inherent potentialities that exist in the cultural and natural physical worlds. As a result, the ecological approach is seen to validate the design process by linking it to the conditions of life which support and enhance a given area.

It is significant to note that several important themes work to consolidate the merits of this position as an effective contribution to the practice of urban design. The first is that of restoration or *reinhabitation.* Peter Berg and Raymond Dasmann (1990) define reinhabitation in the following way –

> "*Reinhabitation* means learning to live-in-place in an area that has been disrupted and injured through past exploitation. It involves becoming native to a place through becoming aware of the particular ecological relationships that operate within and around it. It means understanding activities and evolving social behaviour that will enrich the life of the place, restore its life-supporting systems, and establish an ecologically and socially sustainable

> pattern of existence within it. Simply stated it involves becoming fully alive in and with a place. It involves applying for membership in a biotic community and ceasing to be its exploiter" (p. 35).

The implications of this definition for urban design, while not definite, are discernible. Perhaps, the most obvious is that the essential nature of design from an ecological perspective is to rebuild connections to natural systems and environmental processes. Technology is no longer an issue since it is now possible to build any landscape except for the one that exists (or existed) naturally (Baines, 1990). Consequently, designers should work to identify or rediscover "eco-technologies" (Bookchin, 1980) that utilize the natural capabilities of vegetation, climate, and topography as sustaining features of the urban landscape. The essential difficulty, however, lies in the interpretation of this landscape and its inherent patterns of life.

In contrast, the second theme emphasizes the concepts of *impact* and *fit*. As Davidson (1991) has noted, planning is being forced to internalize the notion of cumulative impact within many of its operating processes. In terms of urban design, the ecological perspective challenges planners to investigate not only the environmental and climatic consequences of particular design schemes, but to adapt the social, cultural, and technical aspects of the design to the environment as well. In simple terms, it places a renewed emphasis on comprehensive planning frameworks and investigation prior to design.[6] The sole purpose of this comprehensive orientation is to qualitatively improve the relationship of the proposed intervention with the environment from the outset *and* over time as the environment changes. McHarg (1969) has noted that this is a radically different conceptualization of design than was promoted by the Modern Movement – "Certainly we can dispose of the old canard, 'form follows function'. *Form follows nothing – it is integral with all processes. Then form is indivisibly meaningful form, and it can reveal ill fit, misfit, unfit, fit, and most fitting*" (p. 173, emphasis added). This is an attractive position for urban design review that stresses wider contextual understanding and problem definition.

The final theme is characterized by the concept of urban or environmental *health.* It is based in the ultimate recognition that it is how individuals think of themselves and their surroundings – "the mind of the city" – that determines thequality of the environment and the lives of its people (Duhl, 1989, p. 1). McHarg (1969) has recognized this factor in his ecological planning model since it works to increase the appearance of levels of order through apperception and the symbiotic adaptation of the city to the natural and social environments. The critical evidence which supports the logical development of this model is the qualitative improvements in the overall pathology of the urban area; its *health* (p. 196). This is a critical observation since it places the relative contribution of urban design into a workable context. In specific terms, the planning process is conceptualized as the development of sustainable healthful environments. Within this larger process urban design serves to uncover and capitalize upon the specific formal qualities that reinforce the visual, perceptual, social, and natural ecological systems in the environment.

5.4 Chapter summary

This chapter has examined the influence of the emerging ecological perspective on the substantive notion of urban design. Throughout the discussion two important observations were made. First, it was noted that a broader sense of urban ecology recognized the critical importance of both social and natural physical systems. This conceptualization strengthens the observable connections between the built form of the urban area and the natural ecological systems that are operating in it. It also underlines the importance of connectivity, context, and place-specific identities from an ecological point of reference.

The second observation was that an ecological approach stressed three important themes – reinhabitation, impact and fit, and environmental health. By working to restore the essential linkages between the social, natural/physical, and built environments, urban design was recast as an investigative process of adaptation and adjustment. It is essential that the parameters of the existing ecological environments be uncovered and utilized to enhance the

intrinsic suitability of basic design interventions within this process of creative investigation. Qualitatively, this type of development impacts upon the healthfulness of an urban area both as a place to live and as natural ecological environment.

Notes

[1]The ecological perspective is arguably the most significant and growing area of interest in a number of disciplines. Consequently, the range of opinion, fact, and available research is very substantial and encompassing. While it is evident that the body of this research is relevant to the development of a definitional understanding of urban design, only an embarrassingly small selection of literature is represented here to develop the essential arguments and themes. This has been a conscious decision on the part of the author since a review of the totality of this literature far exceeds the scope of this thesis. However, one of the primary contributions which is to be made in this thesis is to underline the connections between the various perspectives influencing urban design in order that significant contributions from all areas can actively be incorporated into practice. The present approach will provide a platform for future research which is much needed in this area.

[2] Phil Wichern (1987) has thematically represented this perspective using the acronym – SHEVESULE. It stands for "Safe, Healthy, Economically Viable, Ecologically Sound, Urban Living Environments".

[3] The effective mechanism of this process was a series of single-attribute maps on acetate sheets which, when layered, highlighted suitable combinations of uses and land-use patterns. Advances in computer technology have improved the accuracy of this deductive reasoning process in addition to developing alternative techniques of analysis in two and three dimensions. The significant point is that McHarg's early approach is a classic example of this type of analysis and much of this newly developed technology still reverts to improving the standard layering methodology which he employed in the late 1960s.

[4]See Section 3.2.1 for an elaboration of this technique.

[5]In light of the contribution made by Hillier and Hanson (1984), this is an important advance in technical urban design capability. Specifically, Anderson's approach has worked to connect design with the underlying "transpatial" social structure of this section of Paris as it is represented in the "local" spatial pattern. For a clarification of the significance of this point see section 2.1.5.

[6]Although this ecological approach is based on comprehensive understanding, it is not to be confused with the rational-comprehensive approach to planning. For an elaboration of this planning perspective, see Friedmann's, Planning in the Public Domain (1987).

PART III

Process

Procedural design theory views the *design process* as the object of analysis. It is concerned with the methodology of design inquiry, common decision making strategies, and the roles that an individual fulfills while designing. When viewed from this perspective, urban design is not easily distinguished from architecture, landscape architecture, and the other design professions. It is a complex problem solving activity that encompasses a range of skills and a number of discernible stages. Procedural design theory clearly underlines the connectivity of design technique and design theory. In addition, it points to the complementary nature of the creative thought process and the formalized activities of design practice. In real terms, procedural urban design theory concentrates on what urban design itself *appears to be* rather than *what it should accomplish.*

CHAPTER SIX

METHOD AND PROCEDURE IN URBAN DESIGNING

"Poetry is not like reasoning, a power to be exerted according to the determination of the will. A man cannot say, 'I will compose poetry.' The greatest poet cannot even say it: for the mind in creation is as a fading coal which some invisible influence, like an inconstant wind, awakens to transitory brightness: this power arises from within, like the colour of a flower which fades and changes as it is developed, and the conscious portions of our natures are unprophetic either of its approach or its departure."

– Percy Bysse Shelley, 1820

"And it is here that we discover there is no such thing as the design process in the restricted sense of an ideal step-by-step technique. Rather, there are many different styles of decision-making, each with individual quirks as well as manifestations of common characteristics."

– Peter G. Rowe, 1987

Common parlance characterizes design as an intuitive exercise that gives expression to particular spatial forms or objects. The designer is seen as a master of the creative process who mysteriously combines disparate requirements into a compositional plan. The focus of inquiry is directed at the set of principles which designers utilize to develop an idea from a preliminary concept into a building complex or urban open space. It is directed at the internal systems of logic which order these principles with respect to each other in addition to their visual representation and expression. It is directed at the particular normative visions which designers rely on to rationalize these systems of logic. It is directed at designing as art.

Most schools of architecture and city planning have promoted this conceptualization of design as the unchallenged foundation of their educational programs (Lang, 1987). For this reason, many designers believe that beyond the recognition of these inventive and intuitive processes, *design ceases to be design.* To the contrary, it is also legitimate to categorize

design as a process of directed inquiry within which there are discernible similarities between designers and various schools of design theory (Rowe, 1987; Schön, 1983). This categorization shifts attention to the activity of *designing* as it can be isolated from particular normative references to urban form or "good" architecture. It is aimed at the underlying processes of creative investigation in addition to the informational requirements of the designer while designing. Similarly, it is concerned with the inherent relationship of these constructs to the particular structure of design problems themselves.

The purpose of this chapter is to examine the design process as a formative element of urban design practice. This investigation is easily justified since it is necessary to understand the implications of the design process for urban planning on their own terms. Specifically, the discussion will focus on the structure and types of information that are valuable to designers at various stages in the design process. Considerable attention will also be directed at the role played by participatory design techniques for improving client satisfaction and meeting user requirements in the urban design process. It should be noted that the purpose of this chapter is not to develop or recommend a series of alternative design procedures. Rather, it is only intended to provide an overview of the thought patterns and technical procedures that are associated with most design work. In other words, it is meant to speak to the relative merits of designing through a quantification of procedural design "intangibles".

6.1 Designing as a creative process

As soon as the creative nature of designing is recast in the context of a problem-solving exercise, Peter Rowe (1987) has discovered that designers are quick to raise objections since *design is, by definition, more than merely a problem-solving activity* (p. 39). Accordingly, his response has been to address what is meant by the term "problem" in the context of the design process. From this perspective, a distinction can be drawn between *well-defined* and *ill-defined* design problems. It is further possible to identify another class of problems that

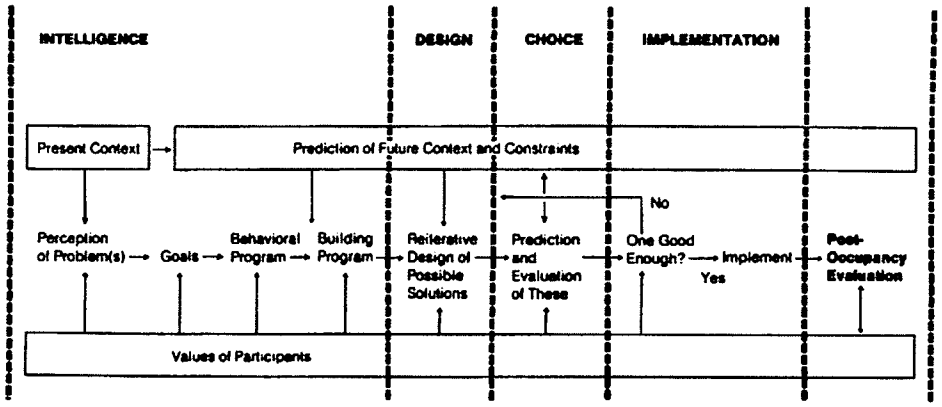
has been termed "wicked" (Churchman, Ackoff, & Leonard, 1967).

Well-defined or "tame" problems are those for which the goals are readily apparent and the basic design exercise lies solely in the appropriation of means (Rittel & Webber, 1972, p. 392). Solutions are exhaustively formulated and can be attained without additional information. In contrast, ill-defined problems are characterized by a lack of clarity in both their ends and means. The basic problem-solving exercise, in these terms, usually focuses on goal-setting procedures and the translation of goal statements into particular courses of action. This subset of problems characterizes most design and planning practice forcing these activities to begin with some type of discovery or orientation stage. Finally, wicked problems are so ill-defined that they have no definitive formulation or "stopping rule" for terminating the problem-solving activity (Rowe, 1987, p. 41). For them, alternative reformulations of either goals or means results in unique solutions that can neither be termed correct nor incorrect without further evaluation or information. Lang (1988) has noted that these wicked problems make-up a larger part of the design process than most designers care to admit (p. 24). Consequently, designing is often reduced to the manipulation of those aspects of the problem that are solely within the designer's control as they impact on the appropriateness of particular solutions.

The creative design process can be broken down into several components, each with a fairly representative identity and focus of inquiry. From this perspective, design can be conceptualized as a fairly systematic process of investigation with eight basic steps[1] – research, analysis, programming, synthesis, evaluation, design, implementation, and post-implementation evaluation (Rowe, 1987). Lang (1987, 1988) has further refined these basic steps into five groups of related activities that more closely approximate the temporal sequence of the real world design process (See Figure 6.1). This approach is utilized for the purposes of this chapter because it recognizes that each step in the design process is not necessarily carried out exclusively prior to the inception of the other stages. In other words, Lang conceptualizes design as a series of five overlapping activity phases – *intelligence*,

design, *choice*, *implementation*, and *post-occupancy evaluation* – that variably emphasize the contextual requirements of the site and the values of clients, potential users, and the environment. Each of these phases will be examined more closely in the following discussion.

Figure 6.1 - A general model of the environmental design process.



Source: Lang (1988, p. 45)

6.1.1 The intelligence phase

The intelligence phase can be qualified as a period of investigation and discovery. The designer searches to definitively analyze the design problem and the specific parameters that shape it. As a result, it often consists of an extensive elaboration of goals, objectives, and opportunities for the proposed project in addition to enumerating the various client groups, user populations, and participating agencies. In most cases, the intelligience phase begins when there is a perceived discrepancy between the particular qualities of the surrounding environment and the expectations of the designer or some other individual with respect to its use. This tension between existing and potential environments which is the essential characteristic that pervades all phases of practice in the design fields including urban design (Hack, 1991; Rowe, 1987; Schön, 1983, 1990a).

On this basis, there are two fundamental positions that have been traditionally defended. The first classifies the intelligence phase as a *decompositional process* of analysis which precedes the synthesis of integral findings in the design phase (Rowe, 1987). Critical investigations are aimed at differentiating particular physical elements within the neighbourhood or site in addition to classifying the effects of important outside influences and socio-cultural systems. Specific design techniques like typological analyses or psycho-spatial mapping procedures are operationalized to elicit these underlying design structures for these purposes. In contrast, the intelligence phase can also be characterized as a *procedural synthesis* that establishes linkages between the various social and cultural environments in addition to the important physical and spatial elements. It is this basic understanding of the "structure" of the urban environment, that makes it possible to *deconstruct* alternative solutions while designing.[2] The emphasis from this perspective is placed on ascertaining the contextual nature of the design problem. As was the case in the previous example, designers have similarly developed techniques for eliciting these types of information using matrix-analyses, group brainstorming procedures, and educational techniques (Smith & Hester, 1981).

The significant point is that the intelligence phase polarizes the design process to the complementary themes of *decomposition* and *recombination.* This forces designers to consider the relationship of seemingly unrelated elements within the larger "environment" and further to devise internal operational rules which elaborate on these relational principles.[3] Baines (1990) has noted the importance of this type of constraint setting procedure. Constraintless design exercises are not only *wicked* problems, but practically non-workable, since the creative faculties of individual designers are based on the manipulation of particular parametric requirements in known spatial environments. In these terms, the intelligence phase can be interpreted as the priorization and elaboration of the necessary constraints that make it possible for the design phase to begin.

6.1.2 The design phase

The preparatory work of the intelligence phase gives way to a contrasting set of cognitive procedures in the design phase. Here attention is directed at the incubation of design ideas through processes of creative exploration. The designer works to generate these new ideas in unique and contrasting ways in order to further illuminate the design problem and bring it closer to a solution. A solution is verified by comparing it with some particular conception of what is acceptable or inventive in the design proposal (Dickerson & Robertshaw, 1975).

Qualitatively, this process of investigation and verification has been characterized as a *reflective conversation with the situation* (Schön, 1983, 1990a, 1990b). "Each move is a local experiment which contributes to the global reframing of the problem" (Schön, 1983 p. 94). The designer operates to test particular arrangements or compositional schemes against a universal referent – often the intended outcome. By balancing this vision against the designer's own cumulative understanding of similar problems, the designer is able to continually reshape the problem at hand thereby preserving its uniqueness and at the same time strengthening its connection to "other projects which he has known in the past" (Schön, 1990b). Conversely, this reshaping of the problem impacts upon the local order of the design and gives it a characteristic orientation and structure. In specific terms, it is this continual alternation of *divergent* and *convergent* thought processes respectively, that distinguishes the creative aspects of the design process from the other phases (Rowe, 1987).

From this perspective, the task of designing is construed in a conventional way that makes it possible to distinguish between the particular "tools" that designers reason with and the things that they reason about. It can be shown, therefore, that designers rely on a series of "autonomic prestructures" for solving creative design problems (Hillier & Hanson, 1979; Hillier & Leaman, 1976; Mueller, 1981; Schön, 1983, 1990a). In other words, they rely on prototypes – particulars which function in the general case – as guidelines for their inquiry. Schön (1990a) differentiates four classes of these prestructures. *Functional* prestructures are commonplace parameters that operate as resources to the design and which create the

necessary bases for reasoning towards it. *Referents* generate or justify an approach which dictates a sequence of moves through to completion. When employing a *spatial gestalt*, the designer constructs a "perceptual figure" from which it is possible to anchor the design problem as a basis for future steps. Finally, *experiential archetypes* are reflective images of objects or universal qualities in the environment that qualify the feeling of a particular design outcome.

Figure 6.2 - The relationship of design prestructures to design domains.

Prestructure	Definition	Domains	Definition
Functional prestructures	Commonplace parameters that operates as resources to the design and which create the necessary bases for reasoning towards it.	Cost	Dollar cost of construction.
		Structure/technology	Structures, technologies, and processes used in building.
		Program/use	Functions of buildings or building components; uses of buildings or site; specifications for use.
Referents	Generate or justify an approach which dictates a sequence of moves through to completion.	Siting	Features elements, relations of the building site.
		Explanantion	Context of interaction between designer and others.
		Precedent	Reference to other kinds of buildings, styles, or architectural modes.
Spatial gestalt	A perceptual figure from which it is possible to anchor the design problem as a basis for future steps.	Building elements	Buildings or components of buildings.
		Scale	Magnitudes of building and elements in relation to one another.
		Form	1) shape of building or component. 2) geometry. 3) markings of organization of space. 4) experienced felt-path of movement through spaces.
Experiential archetypes	Reflective images of objects or universal qualities in the environment that qualify the feeling of a particular outcome.	Organization of space	Kinds of spaces and relations to one another.
		Building character	Kind of building, as sign of style or mode of building.
		Representation	Languages and notations by which elements of other domains are represented.

Source: Adapted from Schön (1983, p. 96; 1990a).

From Figure 6.2, it is also clear that these prestructures can be further distinguished by associating them with the components of a practical language that designers have been observed to employ during the design phase. Schön (1983) calls these components *design domains*. "These design domains contain the names of elements, features, relations, and actions, and of norms used to evaluate problems, consequences, and implications" (p. 95). In other words, they are variably emphasized by the designer to fulfill a number of objectives including the justification of particular decisions and the investigation of the broader implications of individual moves. For example, by understanding an urban space's felt-path geometry[4] – the intuitive experience of movement through the plan – the designer is able to connect important visual cues to a larger ordering concept and therefore move the design process though to completion. In contrast, where this approach does not lead to an acceptable resolution or seems inappropriate for the given problem, the designer relies on other design domains as necessary to explore other possible avenues.

The key point is that each design domain represents a category of information that has been shown to be valuable at various stages of the design process. As inputs, they are based on the nature of those problems that designers face while designing. Utilized in this way to quantify the outcomes of individual moves, the designer's appreciation of the design problem is enhanced and directed towards higher levels of understanding.[5] This phenomenon which Schön (1983) terms "constancy of appreciation" establishes a continuity in the design process that encourages further experimentation using alternative design strategies (p. 272-273). Qualitatively, the design *talks back* to the designer in this way until each detail is refined to acceptable standards of performance.

With respect to problem-solving procedures, individual designers emphasize different approaches. The most common strategies include trial-and-error, generate-and-test, means-ends analysis, and problem space identification procedures (Rowe, 1987, p. 51-74). The trial-and-error method approximates a random process of investigation that is directed at seemingly indiscriminate parts of the design problem. In contrast, generate-and-test

procedures extend an individual idea from its inception until it has resulted in a positive outcome or it is no longer feasible as a solution. From this perspective, the range of possible solutions are not integrally linked in either conceptual or temporal terms within the design process. In means-ends analysis, the designer develops a particular geometry or decision-making rule that is used for completing the design. This rule directs the design inquiry until it is necessarily modified or abandoned. Finally, problem space identification involves elaborating on the spatial consequences of different routes through a design decision tree. It allows the designer to evaluate individual decisions that were made throughout the design process and to identify more acceptable outcomes on this basis. No matter which problem solving strategy is favoured by an individual designer, it is interesting that the basic thought processes and informational requirements remain constant throughout the design phase (Schön, 1990a). This observation reinforces the utility of design domains as ordering concepts for all designers.[6]

6.1.3 The choice phase

The choice phase is predicated upon the evaluation of particular design proposals. This evaluation can take place on the merits of individual proposals or as they are contrasted to competing alternatives. Theoretically, at least, this process is based on two fundamental activities. First, concerted effort is directed at defining a number of consistent evaluative criteria that sufficiently represent the social, cultural, and aesthetic values with respect to the project. Second, there is some form of experimentation or modelling within which these criteria are rigorously applied to the project. In this way, the impact of the proposed design project on the surrounding neighbourhood can be predicted and evaluated. Often this is accomplished through visual representation, modelling, and more frequently today using computer simulation routines.

However, the choice phase is not often so well delimited. Lang (1988) explains,

> "In all the environmental professions...there is a continuous reliance on the

> jury system using subjective assessment – the black box approach. Constructions costs, and increasingly maintenance costs, play an important role in the evaluation of and discrimination between design proposals. However, given two schemes of approximately equal cost, or two schemes with very different costs but also very different performance characteristics, it is largely subjective judgement that is used for evaluation. The quality of the decision depends on the attitudes of the jury – their beliefs about how the project will operate on whatever dimensions they choose to consider and their evaluation of this performance" (Lang, 1988, p. 71).

Furthermore, there is often little connection between those parameters which the designer used to produce the design and the particular dimensions that were promoted in its evaluation. For this reason, the choice phase is not well linked to the earlier design phases. At the same time, the final evaluative decisions are not often wholly representative of the merits of individual proposals. In fact, the standard techniques of graphic presentation and three-dimensional modelling that have often been employed by designers are often incomprehensible to user participants and decision-makers not acquainted with the design process (Barker, 1979; Beck & Teasdale, 1977; Francis, 1982; Hester, 1985; Lawrence, 1985). The choice phase is consequently hampered by the lack of effective evaluative procedures that can be readily applied in a wide range of situations.

6.1.4 Implementation and post-occupancy evaluation

The implementation and post-occupancy evaluation phases begin at the completion of the choice phase and after construction, respectively. The implementation phase is concerned with the physical development and construction of the selected design on the site. This is a relatively slow period of activity in which the designer is occupied by ensuring that plan specifications and detailings are followed correctly. In the post-construction period, on the other hand, the designer is ideally concerned with re-evaluating the success of the particular project. This involves making corresponding adjustments to the various assumptions that were made about key aspects of the project once it has been occupied. As was the case in the

choice phase, designers are not often eager to enter into an effective post-occupancy evaluation and consequently very little is known about the potential for expanded verification and testing procedures after construction. This point will be developed further in the next section.

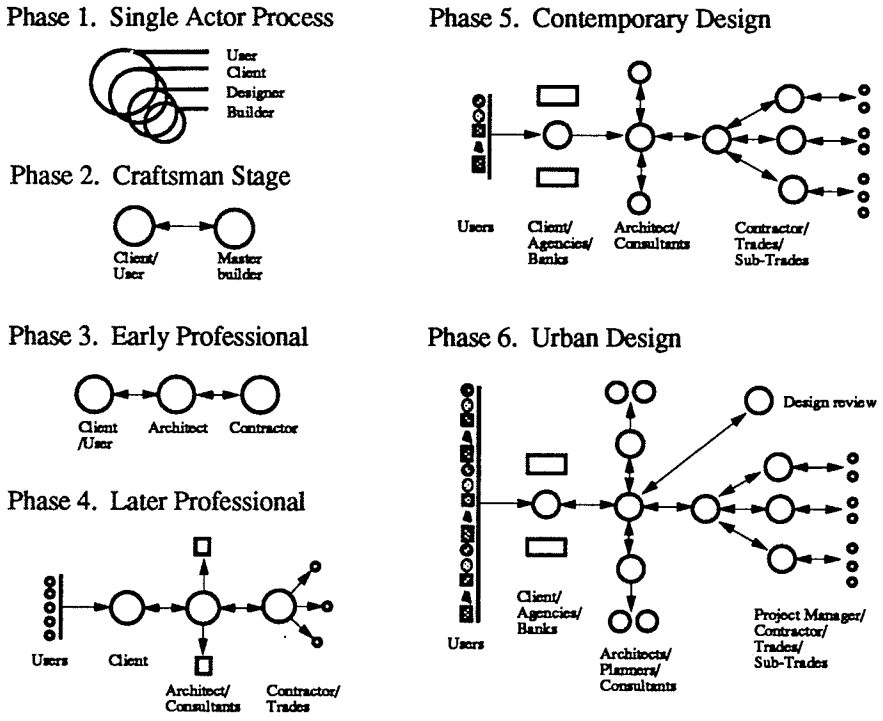
6.2 The formalized design process, user-needs, and participatory design

This chapter has basically focused on the nature of design as a creative cognitive process to this point. Where possible the discussion has been confined to a description of the relevant problem solving activities and informational requirements that an individual designer requires as the design progresses from its inception to its implementation. It is the objective of this section to expand upon the broader contextual environment within which these cognitive processes operate. As a result, this section is intended to focus on the design process as a formalized activity with a variety of participants, procedures, and specific implications for urban design.

6.2.1 The evolution of the formal design process

The design process has evolved into a complex procedure that includes many interests and constraints. This is easily demonstrated by Figure 6.3. The least sophisticated vision of the design process can be conceptualized by the single actor phase. Here the various roles which the "designer" was required to play as owner, occupier, and builder of the project integrated the design process throughout the entire project. The design process, in these terms, was simple – "you needed a barn so you built one". As professionalism increased and the formalization of design procedures began, however, the designer was forced to incorporate other points of view and numerous other constraints into the design equation. In the earliest stages of this formalization process, it was still not too difficult to accomplish this task as it only required representing the needs of the client and a relatively homogeneous group of users. However, it became more and more necessary for designers to incorporate the requirements of a broader range of users, client agencies, and banks into the design process.

Figure 6.3 - The evolution of the formal design process.



Source: Adapted from Marcus and Sarkissian (1986, p. 2).

Similarly, the supervisory role of the designer expanded in response to a rapidly expanding construction and development industry. With respect to major urban design projects, this formalized design process has reached an even greater level of complication. In this light, many designers often work together with consultants, politicians, and government departments on large urban-scale projects.

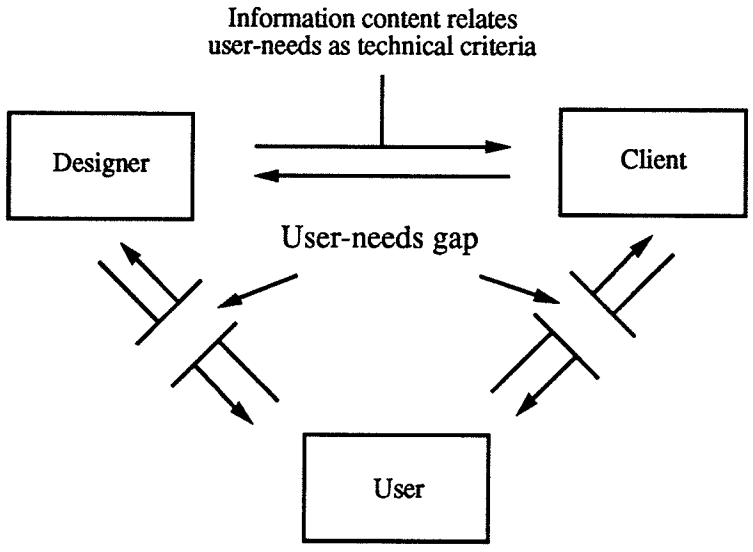
The cumulative effect of these developments is that the individual designer has been progressively removed and isolated from the true user populations. This has typically occurred in a number of ways. For example, the designer is often forced to bend to the economic and temporal demands of the client. In addition, the information which the designer does receive about user-needs is often distorted by the lengthening of the design process and the inaccuracy of the basic assumptions that the client makes about the potential users of a project. As a result, many designers are forced to rely on their own personal

assumptions about user populations which have developed from personal experience and educational training (Hillier & Hanson, 1979; Hillier & Leaman, 1976; Lawrence, 1982a, 1982b, 1985). Where the designer and user populations are at variance with respect to these assumptions (either in socioeconomic or cultural aspects) the resulting designs often have catastrophic effects (Barker, 1979; Beck & Teasdale, 1977; Hall, 1969; Hall, 1959; Lynch, 1971; Marcus & Sarkissian, 1986; Ndubisi, et al., 1984; Weber, 1986). The completed design project is often insensitive to the real world requirements of the people that are expected to live and work in it. This dysfunctional mis-match between reality and the completed design project serves to underline the inadequacy of most of the assumptions that were made by the designer in the first place.

6.2.2 The user-needs gap

Sue Weidemann (1989) has qualified the effects of this expanded design process in terms of a "user-needs gap". Pictorially, the user-needs gap is shown in Figure 6.4. This diagram emphasizes the fact that user populations have been cut off from the decision-making

Figure 6.4 - The user-needs gap.



Source: Adapted from Weidemann (1989).

processes during design. As a result, the designs which often emerge are "...strong and resistant to human imprint. To their inhabitants, [they] seem impervious, impersonal, and inorganic" (Sommer, 1974, p. 2). What makes this situation even more difficult to correct is that user-needs are usually translated by the client (usually a government agency) into a format which demonstrates the priorities and concerns of efficient program delivery (MacPherson & Lipman, 1979). For example, suitability of a dwelling is translated into a measure of area per person (Social Planning Council, 1979), economic efficiency is translated into the standardization of designs and street furniture (Bushell, 1987; Diamond, 1972; McCann, 1987) and user-needs are translated into technical guidelines representing minimum design criteria based on ergonomic data and human spatial requirements (see for example, AIA, 1987; CMHC, 1974). While this type of information may not accurately represent the needs of residents for safe and secure downtown streets for example, it is well-suited to the requirements of the creative design process.[7] As a result, this technical data is repeatedly incorporated as the basis of many urban design projects. Unfortunately, it is often the only consideration that the user is afforded during the design process.

Consequently, a strengthened commitment to user-needs analysis and the development of participatory design techniques has been promoted in many design-related fields (Ward, 1987). The intent has been to use the design process itself to bridge the user-needs gap by including residents in all stages of the design project. It is assumed that as a result of their inclusion in the design process, residents will be more well-equipped to create and maintain a sense of community, thereby enhancing their satisfaction with the surrounding urban environment (Francis, Cashdan, & Paxson, 1981). As a basis for action, these assumptions seemingly provide a clear statement of promise for these participatory design projects. The reality of this "participation panacea" is, however, very different (Owens, 1986, p. 1). Tom Woolley (in Owens, 1986) points out that many of the existing projects do not report consistently higher levels of resident satisfaction when utilizing participatory design techniques. In addition, communication between the designer and the user public is often

ineffectual, stemming from the inability of architectural schools to prepare designers for this new and demanding role. Woolley concludes that worthwhile participation is, at best, not easily achieved.

The user-needs gap seemingly represents far more than a structural limitation of the design process to provide opportunities for communication between the designer and user given these findings. In order to further elaborate on this point, the user-needs gap and the formal design process can be broken down into two areas of interest. The first relates to the processes of user-needs definition and the translation of this information into workable design solutions. In contrast, the second places emphasis on the respective roles of the user, designer, and researcher in the design process. Each of these areas will be considered separately in the following sub-sections.

6.2.3 User-needs – information, analysis, translation

The "architectural notion" of satisfying user requirements has long been a primary design intention (Lipman, 1976, p. 12). It may even be acceptable to suggest that in its simplest form, this is the only task which the designer must perform to achieve good design. In these terms, design has to do with "...making shoes that fit, instead of pinching" (Spreckelmeyer, 1984, p. 28). The important question is – "How has design come to neglect the real needs of the user?".

To address this question, it is beneficial to consider user-needs as one of at least six necessary pieces of information which must be interpreted by the designer to generate an acceptable design solution (Purcell & Heath, 1982). The designer also receives information on the biological, physical, and professional requirements for the site, in addition to the technological and legal specifications for the project. As a part of the creative design phase, the designer translates these information parcels into constraints on the final design. In the terminology of the previous section, this information is collapsed into particular reflective design domains which are then variably emphasized throughout the design process as a

means of uncovering potential leads or developing a composite design structure. "The point here is that these constraints are not usually or even largely confined to 'scientific facts'; for many problems they include far more informed consensus, opinion, and even myth than well-tested scientific propositions" (Purcell & Heath, 1982, p. 5). Consequently, those constraints which can be interpreted as facts occupy the forefront of the designer's attention, while the optional and vague (into which user-needs are often categorized) with the exception of aesthetic concerns, are given secondary consideration (Barker & O'Brien, 1974; Lipman, 1976; Purcell & Heath,1982; Seidel, 1981). The solution to this problem seems to rest on obtaining concise factual statements about the relationship of human behaviour to the built environment. In light of the findings of previous chapters, it is evident that this area has been the focus of many studies in the past. The main point is that the results of these studies remain largely unused by designers because the usual problems associated with their interpretation, adaptation, and implementation remain.

To address this issue, Seidel (1981) points to the fact that architects and researchers differ considerably on their definition of what can be considered valuable information. Charged with the competitive nature of the academic world, behavioural researchers subscribe to reporting formats and techniques which are respectable (and often profitable) to their colleagues. Designers, on the other hand, find this information difficult to understand, lacking in it prescriptions for implementation, and far too specific (Purcell & Heath, 1982; Seidel, 1981). Furthermore, designers and researchers can be clearly differentiated by the various problem-solving strategies that they employ. That is "...<u>all</u> human science information is system information: ...it describes relations and not forms" (Purcell & Heath,1982, p. 11, emphasis in original). Even where research has been specifically formulated to relate to urban design, it will never be completely representative of human requirements in the design phase. Using Pye's (1964) terminology, this is because any given principle of operation in design can only be expressed in a multiplicity of forms; a given principle operation can never be translated directly into form.

Paradoxically for promoters of participatory design techniques, it may even be that the introduction of the user to the design process causes the information barrier to grow considerably. As has been demonstrated throughout the literature, user participants in public housing design are uncomfortable with graphic representations of housing design in plan or elevation formats in addition to scale three-dimensional models (Barker, 1978, 1979; Beck & Teasdale, 1977; Francis, 1982; Hardie, 1988; Lawrence, 1982b). In fact, some designers even find themselves confused by scale models when employing them in the participatory design process (Lawrence, 1982a).

To meet these challenges, a number of techniques have been developed for the sole purpose of eliciting user-needs. Hester (1984) identifies no less than sixteen different analytical procedures that have been developed for user-needs identification and analysis ranging from panel discussion to role playing.[8] It has emerged, however, that a method of data collection which combines objective and subjective analysis through personal interviews and systematic observation is most well-suited to the designer (Barker & O'Brien, 1974). Perhaps, this is because the interview format allows the designer to interact freely with the user in order to interpret and test basic assumptions prior to developing a concrete understanding of the problem at hand.

The interview process generally complements the traditional method of writing user-needs into an architectural program (Adams, 1988; Duffy & Worthington, 1977). As a technique, however, programming is severely restricted where this lengthy consultation with the user is not possible. Consequently, Bacon and Jencks (1986) have noted that to be effective, the programming phase must identify the user population early in the design process to ensure continuous user involvement at successive stages. In addition, program information must remain relevant and be structured positively to be useful in meeting user requirements.

6.2.4 Complementary roles in the participatory design process

The second area of associated research is integrally related to the structure of the formal design process. To elaborate on this point, consider that a participatory design framework relies on the ability of individuals with vastly different knowledge bases to make valuable contributions to the design process. In this sense, participatory design begins with an introductory research phase consisting of user-needs analysis and description. This is the *pre-design* stage. Some representative activities of this type of analysis procedure include interview and survey questionnaires, site surveys, and reviewing published case studies. The objective is to identify key user populations and their respective environmental requirements. For these purposes, designers often rely on representative sample populations such as future residents of new housing projects (Barker, 1979; Beck & Teasdale, 1977; Marcus & Sarkissian, 1987).

In contrast, this information is structured and translated into meaningful design proposals in the *design* stage. This stage has been described by Smith and Hester (1981) as a period of participatory goal-setting. Conceptualized in this form, the specific user requirements are comprehensible to the designer thereby creating a worthwhile basis for design formulation. At the conclusion of this step, the emphasis returns to a research and analysis position in the *post-design* stage. The designer returns to the project site and conducts interviews with user populations that are aimed at uncovering the effectiveness of the specific design intervention. These post-occupancy evaluations have proven very successful as generators of design guidelines based on user requirements (Barker, 1979; Barker & O'Brien, 1974; Beck & Teasdale, 1977; Corbett, 1977; Marcus & Sarkissian, 1986).

It is interesting to note that each stage variably emphasizes the importance of the designer, the researcher, and the user-participant over time. Given this fact, the role of the researcher is most significant at the beginning and conclusion of the design process. The inclusion of researchers or scientists in the design process rests on several grounds (Hester, 1984). First, many projects exist where the user population is not yet available or well-defined. Second,

there is a difference between wants and needs that the users may not recognize or express in a form which is useable to designers. Third, since one or two user representatives may not fairly represent the user population, techniques providing validation and accuracy are required. The final point, related to the previous three, is that research experts have useful and relevant knowledge of specific techniques to uncover this information and to contribute it in a meaningful to the design process. What is not clear from these assumptions however, is that this role frame forces the researcher into the uncommon position of information interpreter. This role is in significant conflict with the traditional stance taken by researchers with respect to interpretive analysis. It has proven to be the greatest obstacle which must be over come to encourage more research activity in design (Purcell & Heath, 1982; Seidel, 1981; Weidemann, 1989). Where this has been achieved, the researcher's knowledge of critical analytical techniques, combined with a sense of interpretation, have proven valuable assets to participatory design programs (Barker, 1978, 1979; Barker & O'Brien, 1974; Beck & Teasdale, 1977; Hester, 1985; Sommer, 1984).

In marked contrast, the typical user-participant brings to the design process an information base which is almost completely experiential. It consists of people, relations, wants, needs, desires, and dreams. Perhaps as a reflection of this fact, very little research has been conducted to delineate which user specific skills are complementary to the design process. Most of the relevant literature concentrates on techniques that are valuable for identifying the "representative citizen" in the design process (Fridgen, 1981). As a result, the usual contribution of the user-participant (beyond answering questionnaires and interview questions in the pre- and post-design phases) has been made during the goal-setting and design formulation stages (Appleyard, 1979; Barker, 1978; Barker & O'Brien, 1974; Falanga, 1987; Francis, 1987, 1988; Francis et al., 1981; Hester, 1985; Lawrence, 1982a, 1985 ; McDowell, 1988; Ndubisi et al., 1984; plus others). To accomplish this task, residents have been actively involved in the actual design and layout of housing projects (Barker, 1979; Beck & Teasdale, 1977), dwelling units (Barker, 1979; Lawrence, 1982a, 1982b, 1985), residential environ-

ments (Barker & O'Brien, 1974; Corbett, 1977; Hardie, 1988), public open space, and streetscapes (Appleyard, 1979; Francis, 1987; Hester, 1984, 1985; McDowell, 1988; Scott, 1982). To complement this involvement, user-participants are usually capable of implementing the final design option with assistance from skilled tradespeople in the construction phase (Hester, 1985; Scott, 1982).

The designer adds yet another dimension to the participatory design process. The knowledge base specific to the designer consists of the technical and legal aspects of construction, experience in the design process, and effective communication skills through graphics and modelling. Some of the most effective participatory procedures, however, have entailed redefinition of the designer's role to the scope of a facilitator (Barker, 1978, 1979; Barker & O'Brien, 1974; Corbett, 1977; Francis, 1982, 1987; Hester, 1985, 1987; Marcus & Sarkissian, 1986; Scott, 1982; Smith, 1981). Stanley King's (cited in McDowell, 1988) translation of this facilitator role rests on the designer's ability to act as an artistic interpreter of the user participant's descriptions of desired residential environments. In this role, the designer is often most effective as a means of controlling *imaginations run wild.* In the United Kingdom, this approach has been taken a step further with the provision of Community Technical Aid Centres (Jones, 1987). By using resources provide by these centres in the areas of architectural design, finance, and the legal aspects of development, residents are encouraged to undertake projects on their own accord.

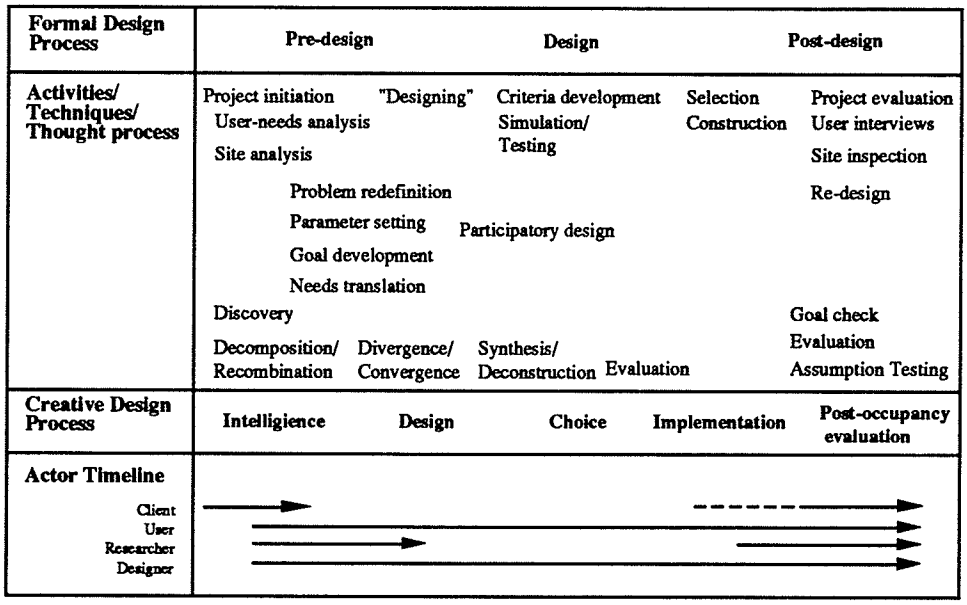
The designer also represents continuity in the design process. As a part of the initial research phase, the designer gains an understanding of those factors which are most important to residents and key user groups. He or she is then able to better help the user-participants formulate realistic options for future development during the design stage. This emphasis carries on through the completion of the working drawings and project construction to the post-occupancy stage. Here, in collaboration with the researcher, the designer is able to affirm those assumptions that have been correctly incorporated into the final design. In addition, the experience gained in previous projects is then carried by the designer into future

participatory schemes.

6.3 Synthesis: A design-built urban design process

To this point in the discussion, a distinction has been maintained between the creative and formal design process in order to provide a clearer understanding of the various aspects of each part. It is evident, however, that these two aspects are integrally connected and mutually dependant within the design process. This point is clearly illustrated in Figure 6.5. Here the

Figure 6.5 - A general procedural model of design practice.



Source: Adapted by author from various sources.

creative design phases are contrasted to the respective stages of formalized design practice. This type of comparison points to several key findings. First, the formalized design process is built from or set-upon the progression of the creative design phases. This linkage serves to underline the temporal development of design thinking from the initiation of the project through to its completion. Second, at any given time within the design process there is a strong connection between the designer's thought processes and the specific design techniques which they are utilizing. For example, the transition from the pre-design to design stage is accompanied with a similar movement away from information producing techniques

to those which classify and organize important findings. In other words, purely investigative techniques like user-needs and site analyses give way to goal development matrices and preliminary design conceptualizations. Similarly, the evaluation and selection of particular proposals is preceded by the development of specific analytical criterion throughout the intelligence and design phases. Finally, the connectivity of subsequent design projects for the designer is highlighted in the post-design stage. That is by evaluating and adjusting basic assumptions at the completion of the project, the designer "learns" or gains new experience which may be applied in the future.

Figure 6.5 also points to the complementary nature of the participatory design process. Clearly, the specific activities of the various design stages are well-suited to different types of input and the critical participation of different actors. Theoretically, at least, a participatory design scheme recognizes this factor by incorporating different people at different times throughout the design process. It is more often the case, however, that these particular role "identities" are assumed by a small group or a single individual at the appropriate times. Still, the basic concept is a valid one since the complementary nature of these actor roles operates as an *offensive design strategy* that unites user interests, design techniques, the procedural staging of projects, and the thought processes of individual designers. The development of this type of "build, test, correct" system is likely to improve the strength of urban design solutions over the longer term.

Two additional observations can be made which have considerable bearing on the practice of urban design with respect to this general model of the design process. The first observation is that even though the necessary informational requirements of the design process are not universally applied by all designers for all design problems that considerable overlap both between and among categories does occur. This is true for the cognitive/creative design phases at least, and as the previous discussion has shown, it is likely that this observation holds its validity throughout the design process. Given this finding, it is logical to assume that it should be possible to identify and classify these informational requirements

so that they are categorically representative of the evolving structure of the design process. In this light, Schön's "design domains" are a significant step forward. Reformulated as evaluative parameters or development specifications, these types of design-oriented informational categories could potentially improve the abilities of designers, planners, and the public to communicate throughout the urban design process. This notion will be extended in later chapters.

Finally, it is necessary to recognize the implicit emphasis that has been placed on *visualization* during the design process. It is self-evident that the activity of designing is centered on one's ability to visualize and interpret spatial information.[9] Taking the broader view, it is more appropriate to conclude that the design process is structured upon a number of different types of *seeing*. At various points in time, an individual is necessarily required to develop and draw connections between different design parameters and to further synthesize and relate these parameters to the larger whole. In terms of urban design, this type of visualization requires not only the ability to understand and interpret spatial information but also an ability to recognize the potential impacts of the proposed development for the surrounding neighbourhood and city. This assessment activity could potentially involve a wide range of techniques including modelling, real-life simulation, laboratory testing, analog model development, and statistical evaluation. Still, it is important to recognize that visualization techniques and drawing are necessary to the success of the design process for all participants including the designer. This factor is an important consideration which must be addressed in all urban design projects.

6.4 Chapter summary

This chapter has examined the procedural requirements and processes associated with designing. It was shown that the larger design process is structured upon a series of design phases that are made up of characteristic creative problem-solving procedures, analytical techniques, and informational requirements. The designer variably emphasizes these

impacts as required to formulate the design and to evaluate the successes that have been achieved along the way. Respecting this temporal progression, it has also been shown that a number of techniques have been developed to incorporate user populations, external researchers, and designers into the design process. Where this has been accomplished successfully, there is some evidence to suggest that user requirements were more appropriately addressed, project satisfaction increased, and the skills of the design process participants improved. This is a significant observation given the expanding participatory nature of contemporary urban design projects.

Similarly, two important observations were made about the design process that have particular implications for urban design review. The first observation is that designers comprehend and apply similar types and categories of information during the creative design process. Given this fact, it is likely that significant improvements in communication between the various parties involved in the design process could be made by elaborating on these categories of information. Second, the design process is predicated upon the ability of participants to see connections and relationships between disparate categories of information. Consequently, it is structured around visual simulation and spatial analysis techniques. Furthermore, future developments in design procedure should work to strengthen these visualization techniques by increasing their comprehensibility, accuracy, and appropriateness throughout the design process. Both of these points will be explored in greater detail in future chapters.

Notes

[1]This does not deny that the individual cognitive processes of designing are intuitive or creative. Rather, it speaks to the basic steps that a designer takes at different points in time. This approach has been utilized here since it highlights the deterministic qualities of the design process itself with respect to the availability and types of information that are most valuable to designers. This is a critical preliminary requirement of the argument which will be built in Part Four of this thesis.

[2]This position was presented very succinctly to me in a number of discussions with Liu Dong

Yang, an interdisciplinary Ph.D student in architecture and city planning at the University of Manitoba in 1991. In his own words, the essence of design is first to "ravel" the design problem and then to "unravel" the design. The key point is found in the early stages of the design process. Here, the designer places a concerted interest in defining the contextual problems associated with a particular urban place. It is this process which works to illuminate the future directions that design should take as an essential solution or unique response to the requirements of the place. For an application of this type of ordering in the design process see Liu (1991).

[3]This observation underlines the opposition which many designers hold with respect to design methodology and operations research. This is easily evidenced in the following way. Donald Schön (1990a, 1990b) has noted there is a considerable tension between the notions of plurality and commonality in the design professions and especially in architecture. In other words, designing (i.e. the cognitive procedures of design) causes a designer to internalize a series of design *rules* or intentions. At the same time, designers (especially those influenced by the Modern Movement) want to develop a unique and stylistic quality to *their* architecture. In Schön's terms, the paradoxical question for them, then becomes, "How is it possible to generate "newness" from contextually developed rules since avoiding them results in confusion and chaos?". For designers who want to preserve the mystique associated with designing, it is an extreme contradiction in terms to admit that design is not only affected by these types of rules but that it may in fact be completely comprised of them.

[4]Similar to the serial vision technique formalized by Gordon Cullen (1961). For an elaboration of this procedure see Section 3.2.3.

[5]This same notion can be expressed in other terms by viewing "design domains" as an elaboration of particular design *heuristics*. A heuristic is a principle or procedure that contributes to reduction in the search for a satisfactory solution (Newell, Shaw, & Simon, 1967, p. 78). From this perspective, design can be reclassified as a process of heuristic reasoning in which it is not known whether a particular sequence of steps will yield a solution or not. Within this process, the heuristic principle (i.e. the autonomic prestructure) provides the particular "rule of thumb" by which decisions are made and evaluated with respect to each other. Rowe (1987) elaborates on particular heuristic devices such as anthropometric and literal analogy, environmental relations, typologies, and formal languages (p. 80-91). The thematic association of these concepts and Schön's "design domains" is duly noted and serves to underline the parallel nature of these classifications.

[6]It should be noted that individual designers tend to employ the same design domains for all design problems (Rowe, 1987). Hence, the *true utility* of a specific design domain for *all* designers is actually somewhat more restricted than the hypothetical potential would suggest.

[7]This is because the clearly elaborated spatial and technical requirements of these data sources help them to be given high priority during the design process. In terms of the previous

section, they are well-developed as constraints to the design process since they match the categories of information that designers employ while designing. That is, *they approximate the structure of known design domains.*

[8]They included – Town Meetings, Neighbourhood Forums, Panel Discussion, Brainstorming, Buzz Sessions, Synectics, Role Playing, Gaming, Interviews, Questionnaires, Observation, Ecological Mapping, Activity Logs, and Semantic Differential Scaling techniques. See Hester (1984) for a brief description and analysis of each method.

[9]In fact, many people believe that urban design is so inherently visual that it should be left to those with the artistic gift of design ability, or at least to those less competent individuals, who have developed it through architectural training and education (See for example, Bacon, 1967, 1985; Eardley, 1990; Hedman, 1984; plus others). A thorough examination of the urban design field will show that this conclusion has a relatively weak foundation. As some forward thinking practitioners have concluded, it is becoming increasingly more obvious that *the specific training of urban designers is less important than their ability to recognize the various aspects of the decision-making process, the importance of functional, social, and aesthetic concerns, and an understanding of policy planning strategies* (Owen, 1987).

PART IV

Praxis

Experience in many North American cities has shown that effective urban design planning is both multi-faceted and complex. It involves growth mangement, project administration, and regulatory supervision in addition to the implementation of broader regional policy programs. These realities force individual designers into an exploration of the developmental processes operating within a given urban area and to understand their effects on the form of the environment. Many municipal governments have structured these interventions around popularized notions of the particular area's identity and those factors which contribute to its continued effectiveness. As a result, several thematic approaches can be identified that variably emphasize the liveability, imageability, and internal coordination of downtown environments as the foci of diverse city regions. Design review is a positive step towards improving the look and feel of the city within these planning programs. It complements existing development control mechanisms and is often viewed as the coordinating mechanism of the planning process.

CHAPTER SEVEN

URBAN DESIGN AS A CONTEMPORARY PLANNING FUNCTION

"The City shall encourage a high standard of urban design in the downtown."

– Section 32(1), Plan Winnipeg, 1989

"Urban design has always been part of the overall framework of planning, whether it has been termed town, urban, or city planning. That is, 'design' has been in one way or another the underlying concern of much broader planning decisions. In short, one has to decide whether to build or not to build; should the decision – the plan – be to build, then a second category of decision must be made concerning what and how to build so that a form, configuration, location, and manner will have the least negative environmental impact."

– Hamid Shirvani, 1985

Urban planning is predominantly concerned with regulating the use and development of land. The physical plan specifies the direction that future extensions of the built-up area should take in order to maximize the use of available resources. It also directs the course of significant policy decisions and therefore impacts upon the effectiveness of capital spending programs, the quality of transit and essential services, the provision of recreation facilities and open spaces, and the overall health of the local economy. In short, the urban area is connected to its physical surroundings by the planning process. The success of which determines the quality of an urban place as a supportive environment for working and doing business, raising a family, and visiting from afar.

Urban design programs are intended to promote high standards for the physical development of the city as a part of this larger process. They represent design conceptualizations of the built environment for certain high profile districts in addition to those areas of the city that are less well known. As a means of translating these visions into action, specific policies are

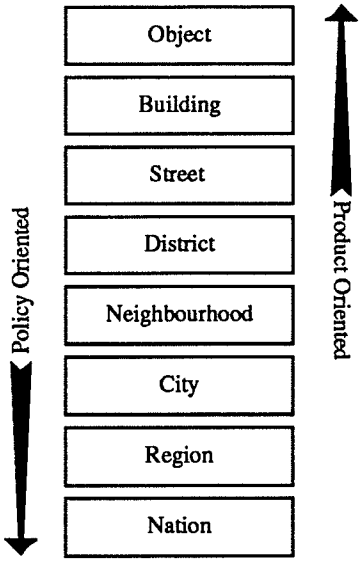
aimed at a range of factors including the compatibility of individual buildings, the integrity of the street environment, the amelioration of negative climatic effects, and the identity of the urban place. From this perspective, urban design programs have tended to focus on enhancing the quality of the built environment by guiding the development process with a range of tools and devices that strengthen the usual planning techniques of land-use zoning and growth management. Design review procedures are one example of this type of adaptation. Unfortunately, the *effective structure* of most urban design programs is often solely determined by the operational requirements of the particular development control mechanisms which have been implemented. They have been established to meet demands for administrative efficiency and fiscal responsibility within strictly maintained jurisdictional environments, while the *real need* for a responsive and effective urban design review process remains unfulfilled.

The purpose of this chapter is to investigate urban design as it has evolved within this regulatory planning environment. This investigation is warranted since it is necessary to understand the significance of established urban design programs prior to the development of an acceptable evaluation model for use during design review. Similarly, it is critical to match the parameters of the proposed project assessment model with the requirements of the design review process. To accomplish these tasks, the answers to the following questions will be explored – "What are some of the tools that are utilized to implement the general physical plan within a given city?"; "What is design review?"; "How does it function?"; and, "What factors are given consideration during design review?". Considerable attention is given to the process of design review and to the criteria that have traditionally been applied at this stage in the development cycle. The discussion also focuses on specific urban design programs by examining their respective orientations, scope, and primary implementation techniques.[1,2] These findings are utilized in the last section to develop parameters which categorically reflect the basic requirements of the planning process for a new urban design review model.

7.1 Urban design programs and urban design planning

Planners are objectively committed to the implementation of the conceptual development strategies contained in most municipal plans and ordinances. This involves clearly stating goals for the development of the larger urban area in addition to translating their implications into a unified plan of action at the local level. Effectively, it is this notion which characterizes urban design planning as an activity that makes connections between present and future environments by giving substance to the stated intentions of the physical plan.

Figure 7.1 - The shift between policy and product orientation as a function of scale transitions in environmental design.



Source: Adapted from Shirvani (1985, p. 142).

From Figure 7.1, it is also clear that this realization underlines the inter-connectedness of key policy measures and the resulting physical design "products" which these measures have helped to shape (Clark & Couture, 1990; Barnett, 1974, 1982; Kachur, et al., 1987; MAA, 1986; Salazar-Rios, 1986a; Shirvani, 1981, 1985). As the scale of a design "problem" decreases, the urban designer becomes more concerned with the immediate parameters and effects of individual design projects. In other words, the focus of inquiry shifts from the visionary to the implemental aspects of the problem (i.e. from *policy planning at a broad*

regional or urban scale to *translating goal statements into definitive design products*, respectively). As is the case in planning generally, success in urban design is determined by the effectiveness with which decisions *can be made and reinforced* at each of these operational levels. Since planners have become keenly interested in the effects that zoning by-laws and management schemes will have on the liveability of the resulting urban environment, the challenge remains for them to identify, coordinate, and develop policy mechanisms that can positively reinforce the physical changes taking place on the ground and *vice versa.*

Integrated urban design programs that bring together project and property management, financing, design, evaluation, and development capabilities at the metropolitan or municipal level have been proposed by many planners as a means of meeting this basic objective (Barnett, 1974, 1982; Mandryk, 1989; Salazar-Rios, 1986a, 1986b; Shirvani, 1981, 1985; plus others). Although some cities such as San Francisco and New York have experimented with this type of comprehensive urban design program, the greatest number of municipalities have created more wide-ranging and diversified organizational arrangements. Effectively, these municipalities have worked to achieve urban design goals by administering area-specific development policies within the framework of established planning organizations. This has included utilizing private development corporations, private-public partnerships, ad hoc design review committees, and specially designated branches within planning departments as agents for regulating urban design policy and undertaking development projects.

The motivation that has been shared from city to city is to create a system which provides for the consistent interpretation of design-related objectives over time regardless of the particular administrative structure that is actually developed (Salazar-Rios, 1986b). In this light, the term "urban design program" can be re-cast to represent the full range of organizational structures, policies, and tools that have been established within a given city to promote effective urban design planning, notwithstanding their level of integration or comprehensiveness. Urban design programs can be contrasted at this level of generalization

in terms of their overall philosophy and principles of practice. It is also possible to describe some of the common techniques and tools that have been employed as a part of these programs for implementing important urban design schemes. Both of these notions will be explored in more detail in the following sections.

7.1.1 Philosophies

Even though it is not always clearly stated in official policies or plans, it is possible to discern a coherent philosophy of action that guides most of the design-related planning activities for a given city. Here, the term *philosophy* refers to the implicit or explicit guiding principles upon which an urban design program has been structured. These principles can be broken down into two inter-related categories. The first set defines various planning objectives by describing the regional or urban identity that will be pursued throughout the course of the planning process. These *theme concepts* connect what the city is with the requirements and goals of the area's residents for the future. In other words, they represent the strategic points of interest that guide daily decision making activities by establishing a basic sense of what the city might become if it is developed accordingly. The second set of principles relate to the procedural *approach* or *orientation* of the urban design program itself. From an operational standpoint, these principles anticipate the necessary administrative structures that make up the regulatory planning environment. They define the scope of the system that will be implemented to control design-related initiatives and correspondingly reflect how rigidly these procedures will be applied throughout the development process.

Figure 7.2 shows that there is substantial variation among cities with respect to the philosophical make-up of their urban design programs. This is not surprising since each urban area has its own unique political situation and jurisdictional environment in addition to being located within specific geographic and cultural regions. It is possible, however, to separate the commonly emphasized themes into five general areas of concentration. Those municipalities emphasizing the *liveable city* theme have tended to stress regional quality of life as

Figure 7.2 - The operating philosophies of urban design programs in eighteen North American Cities.

City	Theme Concepts							Approach/Orientation			
					Architectural Identity						
	Liveable City	World Class City	Regional Image	Pedestrian City	Historic Area	Special Districts	Good Neighbours	Formal	Informal	Process Oriented	Project Oriented
Boston, MA						●	●		●		●
Brandon, MB				●			●		●	●	●
Calgary, AB	●		●					●			●
Edmonton, AB			●			●		●			●
Minneapolis, MN	●					●	●	●			●
Moose Jaw, SK					●		●		●		●
New York, NY		●			●	●	●		●	●	
Ottawa, ON		●		●		●		●			●
Portland, OR	●			●			●	●	●	●	
Regina, SK	●				●			●			●
San Francisco, CA	●		●			●		●	●	●	●
Saskatoon, SK	●			●			●	●			●
Scottsdale, AZ			●			●		●	●		●
Seattle, WA	●		●				●		●	●	
Toronto, ON	●				●		●	●			●
Vancouver, BC	●	●				●	●	●	●	●	●
Victoria, BC	●		●	●			●		●		●
Winnipeg, MB					●	●	●	●			●

Source: Adapted from Shirvani (1981, 1985). Additional information compiled by the author from various sources.

the primary key to urban design practice. These programs encourage diverse humanly-scaled development in order to improve the liveability of the city environment. Similar objectives have been pursued in those urban design programs that have been built around a *regional image* or *pedestrian city* theme. These operating philosophies focus on the unique characteristics of the surrounding area and the supportive nature of well-developed pedestrian environments, respectively. In contrast, those design programs emphasizing a *world class city* theme have tended to focus on the maintenance of strong inter-regional or global identities. This has on occasion even entailed promoting high profile projects (e.g. Skydome in Toronto) or events (e.g. Expo 86 in Vancouver) with enough international presence to remain as a lasting influence on future development schemes.

The final theme area recognizes the importance of specific *architectural identities* at both site and neighbourhood scales. In other words, the urban design program concentrates on

promoting a particular style, type, or mode of building within a delimited area of the urban region. This area can be divided into three basic approaches. The most common focuses on an accepted definition of the factors which enhance the architectural compatibility of buildings between sites. Typically this definition is developed from an examination of the physical characteristics of existing buildings and open areas. It is often expressed as a set of representative guidelines that respect the *neighborliness* of buildings in terms of architectural detailing, massing, and site development. The second approach is often articulated by guidelines for new construction in *special development districts*. Representative of this type of program philosophy are those employed for capital districts, regional park systems, and planned unit developments (PUD's) such as Battery Park City[3] and the Harbourfront development in Toronto. In each of these cases, it is common for extensive conceptual design schemes to be prepared and carried out within the confines of a coordinated development effort. Finally, urban design programs can be based upon the preservation of key sites and *historic districts*. The attention here is focused on improving the sensitivity of new construction to the character of existing structures as defined by their specific architectural features, periods of construction, and relationship to significant events.

Two points about the procedural orientation of urban design philosophies elaborate on the information shown in Figure 7.2. The first relates to the degree of formality that is incorporated into the urban design planning environment. Some municipalities have developed highly integrated urban design programs that are officially mandated as a part of the legal planning process. Others have preferred to pursue design-related goals through informal mechanisms such as development conferences, financing programs, and private development corporations. These two stances can be differentiated by the effectiveness of administrative restrictions, the distribution of fiscal responsibility, the attainment of procedural legitimacy, and the enforceability of design objectives (Salazar-Rios, 1986b; Shirvani, 1985). The second point is that urban design programs vary widely with respect to their *project* and/or *process* management capabilities. For example, some municipalities have

approached urban design planning as a multi-disciplinary problem which has implications at many administrative levels. This has forced them to develop an internally coordinated process for the review, financing, and supervision of urban design projects. In contrast, other municipalities have pursued design objectives at a project scale attempting to integrate city-wide improvements on a location by location basis. This approach is very costly since it entails constant re-evaluation of the existing physical environment in light of stated urban design goals. It does, however, have the potential to foster innovative solutions for long-standing problems since it can dramatically increase the range of options that are considered for any given project.

Several general observations serve to put these findings into a larger context. First, the philosophies of very few urban design programs are focused on a single theme concept. In fact, most programs tend to balance the demands of several theme statements within their overall framework. This emphasizes the inter-relatedness of the individual theme concepts and points to the fact that urban design planning is extremely multi-faceted. Second, there is a qualitative difference between the commonly emphasized theme concepts that effects the success of urban design planning. This can be demonstrated by considering that those programs which can balance the *four conceptual planning themes* – liveable city, world class city, regional image, and pedestrian city – with that of the *architectural dimension* – architectural identity – seem to have the greatest success (Clark & Couture, 1990). This is likely because compatible responses to key problems are readily defined at both macro- and micro-scale levels when this approach is applied. This makes it easier to handle the challenges associated with scale transition and goal translation when dealing with a range of seemingly unrelated projects. Third, those operating philosophies that incorporate a range of formal and informal urban design procedures in addition to concentrating on both project and process orientations have proven to be the most effective (Fisher, 1988a, 1988b; Gosselin, 1990; Shirvani, 1985). Achieving this goal respects the transitory nature of urban design practice by balancing the restrictive regulatory planning environment with a produc-

tive performance-oriented one. It also provides for the internal coordination and recognition of design-related objectives at all administrative levels. Finally, the specific techniques that are selected for implementing the design program are largely determined by the orientation of the urban design philosophy. This point is addressed at length in the next section.

7.1.2 Techniques and tools

Planning tools like zoning by-laws and development plans have been readily incorporated into various urban design programs with different degrees of success. They represent the administrative, procedural, and regulatory devices that have been used to bring about the basic intentions of the urban design philosophy. It is evident that individual municipalities differ significantly in terms of the number and types of techniques which have been employed for the purposes of design-related planning activities (See Figure 7.3). The objective of this

Figure 7.3 - Planning tools used for implementing urban design programs in eighteen North American Cities.

City	Urban Design Plan †	Zoning By-law	Signage By-law	Design Guidelines: Project	Design Guidelines: Performance	Design Guidelines: Prescriptive	Design Districts *	Mandatory EIA: Sun	Mandatory EIA: Wind	Mandatory EIA: Ecological	Bonuses/TDRs	Project Management	Design Review: Voluntary	Design Review: Mandatory
Boston, MA		●	●	●			●	●	●		●	●		●
Brandon, MB		●			●							●	●	
Calgary, AB		●			●			●	●					●
Edmonton, AB		●	●	●			●				●	●	●	
Minneapolis, MN		●	●			●	●		●		●	●	●	●
Moose Jaw, SK		●			●		●					●		
New York, NY		●	●	●		●	●	●	●		●	●		●
Ottawa, ON		●	●		●		●							●
Portland, OR	●	●			●			●	●		●			●
Regina, SK		●			●								●	
San Francisco, CA	●	●	●		●			●	●		●	●	●	●
Saskatoon, SK		●				●	●					●	●	
Scottsdale, AZ	●	●			●			●	●		●	●		●
Seattle, WA		●	●			●	●	●	●		●	●		●
Toronto, ON		●	●			●		●	●		●			●
Vancouver, BC		●	●		●	●	●	●	●	●Δ	●			●
Victoria, BC		●	●		●		●					●		●
Winnipeg, MB		●	●			●	●		●		●	●		●

† Cities with a substantial urban design component as a part of their development plan or with a separate urban design plan.
* Includes special development districts, historic districts, and revitalization initiatives.
Δ Procedural requirements are in the preliminary stages of development.

Source: Adapted from Shirvani (1981, 1985). Additional information compiled by the author from various sources.

section is to describe these tools and where relevant to present their relative merits and disadvantages.

7.1.2.1 Empowering legislation

In accordance with British parliamentary tradition, the right to govern, legislate, and regulate in any area is transferred to Canadian municipalities with special provisions from the provincial government. Similarly, urban municipalities in the United States are empowered with specific legal powers as agreed to by the respective state legislatures. This superior/ subordinate relationship between governments has very significant implications for the ongoing implementation of any local strategies or programs. It determines the scope of the municipal government's authority in addition to specifying the corresponding responsibilities of the government for administering its local policy programs.

With respect to urban design, the legal basis for local governments to enforce design-related policies generally resides in statutes that establish their planning authority and transfer to them the powers to regulate and prohibit the use, distribution, and development of land. The power to designate and zone land for particular uses is almost universally included in these responsibilities. The legal authority to enforce design standards can also be found in acts or subordinate legislation that force municipal governments to meet minimum requirements for the development of important sites or key properties. Similarly, the common law principles associated with property law can be employed by municipalities as land-owners to force subsequent owners or tenants of a property to fulfill obligations with respect to the appearance of a particular site. Given this reality, it is not surprising that there is little consensus between cities with respect to their particular approach to urban design regulation. Furthermore, it is not uncommon for different areas of the same municipality to have disparate restrictions and requirements that reflect changes in ownership of land or jurisdictional authority. The main point is that even though two municipalities may have similar goals, it is the legality of the urban design planning process itself that dramatically

effects how they can be achieved.

For example, consider the various provincial statutes and municipal by-laws that have been enacted in the province of Manitoba with respect to planning powers and land-use zoning. The two Manitoba statues that deal specifically with the legal powers of municipalities to regulate the use of land are *The City of Winnipeg Act*, S. M., c.10 (1989-90) for Winnipeg and its environs and *The Planning Act*, R.S.M., c. P80 (1987) for the remainder of the province. Both statutes set out basic provisions associated with the zoning power that could potentially impact upon the appearance of specific development projects. To demonstrate consider the following excerpt from The Planning Act (1987):

> **"Development standard provisions.**
>
> 43(2) Without limiting the generality of subsection (1), a zoning by-law may contain provisions
>
> (a) prohibiting the uses of land except for such use as may be set out in by-law;...
>
> (f) establishing the dimensions and area of lots or parcels of land that may be used in any locality for uses of land or buildings;
>
> (g) establishing for any locality the number of buildings, and the maximum and minimum floor area of each building that may be erected on any unit of land of such area as specified in the by-law;...
>
> *(i) regulating the location, height, dimensions, and cubic contents of any building or other structure to be erected, constructed or reconstructed, altered, moved, or repaired;*
>
> *(j) regulating the amount of land that, in any locality, may be covered by buildings or structures and the size of yards, lawns, courts, or other open spaces adjacent or appurtenant to any building;...*
>
> *(o) prohibiting the placement of fences, walks, hedges, shrubs, and trees and other objects and where permitted regulate the height thereof;...*
>
> *(t) regulating the placement and maintenance of walls, fences, hedges, trees and shrubs and other objects to provide a buffer between lands for different purposes;...*
>
> (w) establishing standards for "Planned Unit Development District"." [Italicized articles emphasized by author].

A similar set of provisions has been set out for Winnipeg. However, in The City of Winnipeg

Act (1989-90) the following responsibilities were added:

> **"Considerations in review**
>
> 577 In reviewing the Winnipeg development plan, the council shall have regard to,...
>
> (e) open space requirements, including the management and preservation of forested areas and the protection, restoration, reclamation or use of river banks;
>
> *(f) the preservation, protection and enhancement of areas of land, building structures and sites of historical, archaeological, geological, architectural, environmental, or scenic significance;...*
>
> **Zoning By-laws**
>
> 602(1) The council may enact by-laws having force in the city and the additional zone, or in any area or areas in either the city or the additional zone, or both, with respect to,...
>
> (i) regulating the location, height, dimensions, and cubic contents of any building or other structure erected, constructed, reconstructed, altered, repaired or placed after the enactment of the regulating by-law;...
>
> *(o) regulating and controlling the architectural and other details of buildings, except residences, to be built or remodelled in certain specified districts as created by by-law, and for regulating and controlling such details in respect of apartment blocks to be built or remodelled in any part of the city, and to appoint a board, to the approval of which any such building and the plans and design thereof shall conform;...*" [Italicized articles emphasized by author].

The range of approaches to urban design planning that may be utilized inside and outside of Winnipeg are dramatically different as a result of these basic powers transferred to municipalities in their empowering legislation. In the previous example, Sections 577 and 602 of the City of Winnipeg Act (1989-90) give the City of Winnipeg the ability to regulate the architectural details and design for all projects except single family residences; a power that is not transferred to other Manitoba municipalities by the Planning Act (1987). Consequently, design planning efforts in the outlying urban areas (i.e. in Brandon, Dauphin, Portage,...) have been forced to rely on less prescriptive means like project financing incentives to achieve design-related objectives while the Winnipeg situation remains much

more formal in its orientation. In fact, Section 602(1), article (o) of the City of Winnipeg Act (1989-90) specifies that an advisory board shall be created in that city to review and approve plans respecting their design. As a result, the City of Winnipeg Downtown Zoning By-law (#4800/88) includes the following parameters specifying the board's composition and scope of interest:

> **"Urban Design**
>
> 700 No building or structure, including every architectural and other detail thereof shall be erected, enlarged, or remodelled except in compliance with the applicable Design Review designation and the provisions of sections 701 to 704 both inclusive.
>
> **Downtown Design Board**
>
> 701(1) There is hereby established the Downtown Design Board, which shall consist of the members of the Committee on Planning and Community Services from time to time.
>
> 701(2) Whether or not a building permit is required for the remodelling of a building or its details, no building shall be remodelled, erected or enlarged except in accordance with plans submitted and approved by the Board, and no permit shall be issued for the remodelling, erection or enlargement of a building except in accordance with plans approved and endorsed by the Board, including all conditions and limitations endorsed thereon."

This example has demonstrated that empowering legislation sets the tone for the urban design program and goes a long way in complementing or defeating its goals. The implicit or explicit restrictions of this legislation provide the platform from which all of the necessary regulatory procedures are based. It also focuses the planning effort on a few key areas by concentrating on standardized points of interest such as land-use, development and construction standards, design criterion, and administrative processes.

7.1.2.2 Development and design plans

A development plan is a long-range, comprehensive, general policy guide for the physical development of the city. It is the primary planning document that elaborates upon the social and economic objectives of the city and conceptualizes their impact on the urban fabric. The

development plan usually contains the municipal government's schedule for public works and capital improvements thereby serving as a complete estimate of the demand for future services and their potential costs for the community. Similarly, most development plans focus on the primary legislated responsibility of municipal governments to designate and administer the use of land by zoning. In this form, the plan serves as a supporting policy document to the relevant by-laws that are subsequently prepared by a municipality to provide enforceable regulations and restrictions to development. Unfortunately, the development plan is no longer viewed as a detailed design scheme that stimulates the construction of visually attractive and stimulating environments. Even though they were originally intended to represent the base upon which the three-dimensional environment of open spaces and buildings were to be constructed, the design element has been notably absent from many plans in recent years (Hodge, 1986, p. 209). The focus of most plans has shifted to concentrate solely on the policy implications of growth and growth management weakening the connected approach to design and development that was promoted in the past.

In contrast, some cities have continued to view the development plan as an important vehicle for promoting design-related objectives within the development process. For example, the Central City Plan (1985) for Portland, Oregon specifies that urban design is a significant component of the overall vision for the downtown area. By establishing firm mission statements with respect to liveability, density of development, heritage preservation, and the nature of architectural projects, the plan has been clearly linked to the City's goal of providing a workable full service city that is faithful to its surroundings. Similarly, these mission statements can be easily interpreted as performance criterion that can be used for evaluating the appropriateness of projects or evaluating past efforts. The City of Scottsdale, Arizona has also developed a comprehensive environmental design component as a part of its General Plan (1986a, 1986b, 1990). It consists of a set of goal statements and guidelines that focus on character areas, streetscaping elements, open spaces, heritage sites, and resource conservation. The environmental design component is complemented by similar

connected policies for land-use, circulation, and public facilities. The most notable achievement of this approach has been that the urban design element serves to strengthen the community's identification with the development plan by elaborating on the tangible, environmental concerns of area residents (Berndt, 1988).

In real terms, incorporating urban design objectives into the development plan creates two distinct advantages. First, it unifies the regulatory environment by connecting elusive goal statements with key enforcement mechanisms such as zoning by-laws. Second, it reinforces that part of the development plan that is most easily appreciated by residents of the urban area. Together, these factors strengthen the community's commitment to the objectives of the development plan. The cumulative effects of this type of planning environment have been shown to improve the qualitative impact that the concerted development effort will have for the community (Spaxman, 1990).

7.1.2.3 Zoning and signage by-laws

Municipal zoning by-laws or ordinances perform two basic functions. First, they specify the range of uses that is acceptable for a given piece of land. Based on the notion of compatibility, the zoning by-law in this role is supposed to eliminate conflicts between disparate types of activity and allow for a diverse mixture of complementary ones. Second, zoning by-laws have a substantial development control function. They contain, for example, the allowable maximums for the bulk, height, site coverage, and service areas that are appropriate for the particular designated land use. Recently, zoning by-laws have even come to incorporate specific architectural design features and stylistic requirements as a part of this development control function. Signage by-laws have a similar regulatory role with respect to the licensing, location, and construction of commercial and non-commercial signs. Where a signage by-law is not in force, it has been the usual practice in most areas to regulate signage as a part of other related municipal ordinances. Both zoning and signage by-laws specify what review procedures will be implemented and which authorities will serve as official

agents of this process.

Zoning by-laws have been developed almost universally in urban municipalities throughout North America.[4] Until very recently, however, the impacts of zoning by-laws on the quality of the visual environment was not well understood. This is in part due to their preparation as two-dimensional atlas maps with corresponding legal texts and definitions. While this type of zoning by-law is easy to administer and enforce, it has not been easily modified to represent the less tangible qualitative goals associated with real improvements in urban design. For example, Figure 7.4 shows a single development standard that is contained in the zoning by-law for Seattle, Washington (City of Seattle, 1985). It is clear that even though there has been a significant attempt made to address the dimensional inadequacies of the traditional zoning ordinance that very little has been accomplished to improve the

Figure 7.4 - Regulation 49.162B of the City of Seattle zoning by-law.

11. Setbacks between the elevations of fifteen and thirty-five feet above sidewalk grade at the property line shall be permitted according to the following standards, Exhibit 49.162B:

- The maximum setback shall be ten feet.
- The total area of a facade which is set back more than two feet from the street property line shall not exceed forty percent of the total facade area between the elevations of fifteen and thirty-five feet.
- No setback deeper than two feet shall be wider than twenty feet, measured parallel to the street property line.
- The facade of the structure shall return to within two feet of the street property line between each setback area for a minimum of ten feet. Balcony railings and other nonstructural features or walls shall not be considered the facade of the structure.

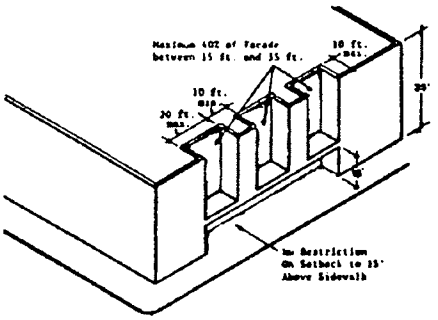


Exhibit 49.162B Exception to Maximum Setback Limits

Source: City of Seattle (1985).

ability of this by-law to express important environmental characteristics in a qualitative manner. Another weakness of the zoning by-law mechanism is that the conventions of the legal language which is employed to produce them also standardizes their impacts on construction and development. This results in visual environments that are somewhat less satisfying than intended by zoning ordinances in general.

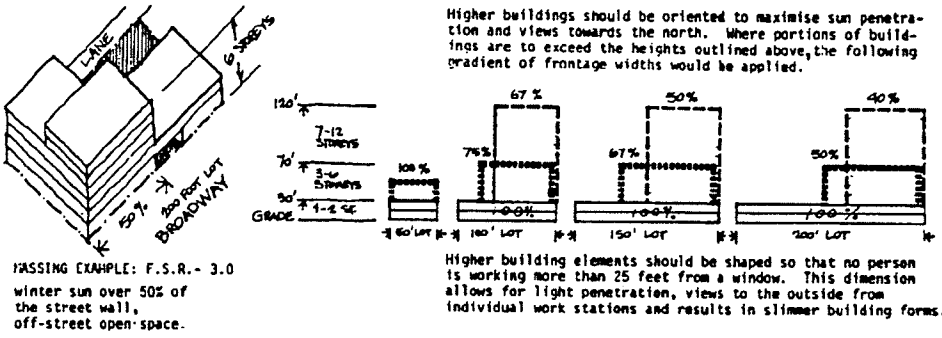
The continual realignment of political interests and community support also affects the effectiveness of the zoning by-law. This is especially evident at the project review stage. The point is that zoning by-laws can be changed by appeal so that the stated development restrictions can be removed from a particular property upon the presentation of sufficient supporting evidence. This process of variation weakens the impact of the zoning by-law and serves to encourage further diversions from the particular uses established for that part of the city effected by the change.

7.1.2.4 Design guidelines

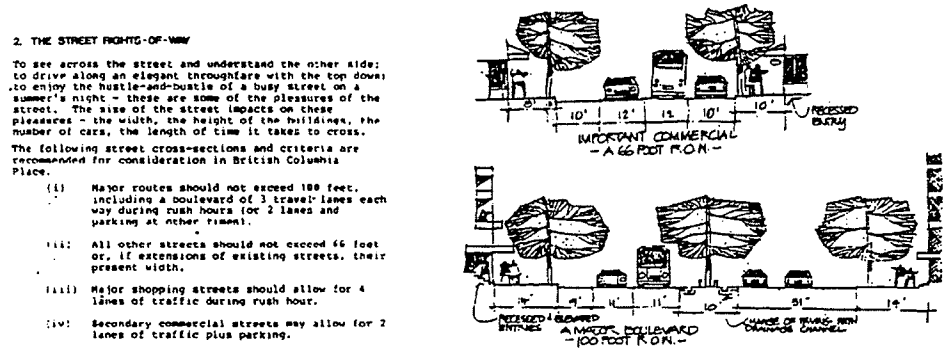
The planning tool that has been utilized most frequently to make the linkage between design-related development policies, planning objectives, and regulatory by-laws is design guidelines. They have been developed to unify the urban design planning effort by elaborating on those aspects of the desired environment that are not easily expressed in other ways. This has included describing the environmental presence and atmosphere of specific urban places in combination with detailed graphics and technical specifications respecting their unique characteristics or layouts. Used in this way design guidelines can provide designers with a means of establishing an acceptable balance between all forms of development. However, most design guidelines have been restricted to defining the particular physical attributes and detail elements that directly influence the aesthetic character of the urban environment.

Structurally, design guidelines are usually formulated in two ways (See Figure 7.5). *Prescriptive* design guidelines employ rigid descriptions about architectural form in order to

Figure 7.5 - Comparison of prescriptive and performance design guidelines.



A. Performance



B. Prescriptive

Source: City of Vancouver (1988a) and BCPCAC (1981).

establish maximum building envelopes within which all construction must be undertaken. In contrast, *performance* guidelines are developed by providing a number of objective and measurable standards as minimum level criteria necessary for evaluating the final design. *Project* guidelines can be developed with either prescriptive or performance orientations. They are, however, intended to illustrate the character concept that will be pursued in areas where none has previously existed or where substantial changes are warranted in response to civic planning goals. Despite the differences in their form and structure, all design guidelines are intended to introduce, describe, and reinforce a consistent definition of design and design objectives for a given area. For this reason, they have been translated almost invariably into enforceable civic design by-laws. This establishes their authority in the law and connects them with the regulatory planning environment.

As an implementation tool, design guidelines are not without problems. Prescriptive and

project design guidelines tend to promote the replication of major structural elements throughout the urban environment. Similarly, they have been criticized by many practitioners for not allowing significant flexibility for architectural expression and designer creativity. Performance guidelines, on the other hand, have been developed to respond to these criticisms by specifying performance standards that should be met by the project proposal. The difference is that performance guidelines do not specify the means by which these requirements must be met and therefore encourage experimentation on the part of the architect or designer. Still, the basic assumptions which have been made in developing all guidelines often overlooks the potential negative and positive consequences of large scale urban design for the residents of the city. In this light, much of that which has been achieved using design guidelines neglects the real needs of the urban environment in terms of its larger physical characteristics and overall environmental quality.

7.1.2.5 Design districts

Another urban design planning technique that has been pursued in some jurisdictions is to establish comprehensive design districts that are administered by some combination of local residents, business owners, and municipal government officials. Typically, three basic organizational perspectives have been employed. The most common is the *historic preservation area.* It involves the identification and designation of key historic structures in a reasonably close proximity to each other for the purposes of preserving the unique character of the district with special development control standards. Second, newly vacated or unused lands can be developed under the supervision of a public, quasi-public, or private development corporation as a *special development district.* This involves the preparation of conceptual plans and the management of project phases through to completion. Finally, many municipalities have established revitalization or *redevelopment districts* with substantial streetscape and storefront improvement programs.

The design district approach has two distinct advantages from an urban design perspec-

tive. First, it creates a secondary management structure that is based on the conditions and requirements of the existing urban environment. Special programs or policies such as comprehensive design guidelines can be administered on a local basis ensuring the maximum benefit for the immediate surroundings and the wider community. Second, these design districts can be augmented with fiscal capabilities that can be utilized to support the design planning process. For example, many municipalities have established *business improvement zones* (BIZ's) that operate on funds generated by an additional percentage levy on the total business tax assessment that is paid out by business owners annually. This contribution is often matched by local governments. These funds are utilized to promote area businesses as a part of an integrated revitalization effort. They are also used to implement local design improvements that are supported by BIZ members. Furthermore, these funds can be used to develop incentive programs for storefront redevelopment projects that assist business owners in upgrading the appearance or condition of area buildings. This approach can have a tremendous impact on the quality of the street environment in relatively short periods of time since design objectives are linked to goals for business development, residential quality, and the integrity of local neighbourhoods.

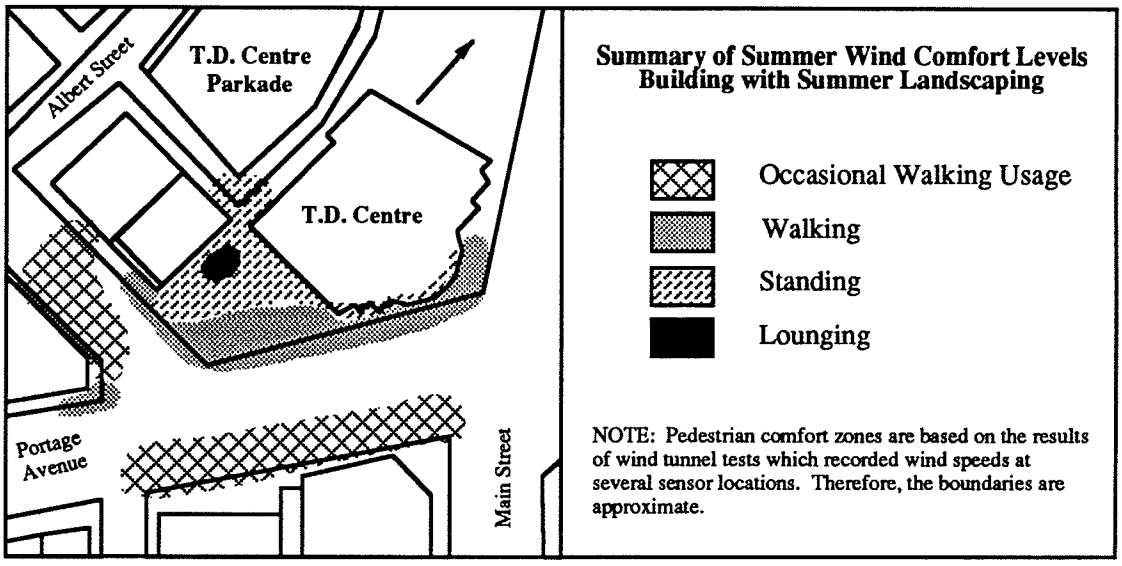
7.1.2.6 Environmental impact assessment

Many municipalities have forced developers to comply with mandatory provisions for wind impact and sunlight accessibility. This involves the evaluation of proposed projects in terms of their impact on the local micro-climatic environment surrounding the building site. The standard procedure is that the developer is required to prepare and submit a statement of suitability which explains the effects that the new project will have on the adjacent areas. Where significant cause for concern is demonstrated at this stage, a complete impact analysis study is usually prepared in concert with consultants specializing in environmental testing. Figure 7.6 shows an example of wind impact analysis for a major development project in Winnipeg. The corresponding shaded areas indicate the various degrees of pedestrian

comfort that have been created as a result of the site design changes and improved landscaping elements associated with the project.

These impact studies provide planners with valuable cues to understanding the effects of

Figure 7.6 - Wind impact statements have become mandatory requirements for large development projects in many jurisdictions. Below is a pedestrian comfort map based on wind speed levels for the Toronto Dominion Centre project in Winnipeg, Manitoba.



Source: Adapted from RWDI (1987).

development on the pedestrian level environment. They also ensure that specific minimum environmental standards can be protected and preserved over time. It is significant to note, however, that there has been almost no effort directed at expanding these assessment powers to include other environmental or ecological concerns. One exception is that the Greater Vancouver Regional District is moving closer to preparing a complete set of environmental development criteria and guidelines (Dickson, 1991). While it is unclear at this time whether these guidelines will include special parameters for ecological impact analysis and testing on all design projects, it is certain that environmental concerns will be represented in the planning process. Given the experience that governments at all levels have in analyzing the environmental consequences of large scale projects such as hydro-electric generating

stations, it is likely that significant advances will be made in this area with respect to design-related projects (Dickson, 1991).

7.1.2.7 Transfer of development rights and F.A.R. bonuses

Planners have always understood that zoning controls are restrictive in nature. In other words, they can only be used to ensure that a particular project does not contravene the acceptable development standards that are indicated for a given area. This is significant because this system did not encourage property owners to exceed these minimum standards as they were set out in the law. Faced with this challenge, planners developed a system of zoning incentives to entice developers to incorporate public amenities, preserve heritage structures, and participate in ongoing design projects (Hodge, 1986; Salazar-Rios, 1986a). The two main instruments of these incentive zoning schemes are the transfer of development rights (TDRs) and the floor area ratio (FAR) bonus.

The principle supporting the application of a TDR is related to the maximum development potential of a specified piece of property as specified in the relevant zoning by-law (See

Figure 7.7 - An illustration of the incentive mechanisms which support TDRs and F.A.R. bonuses.

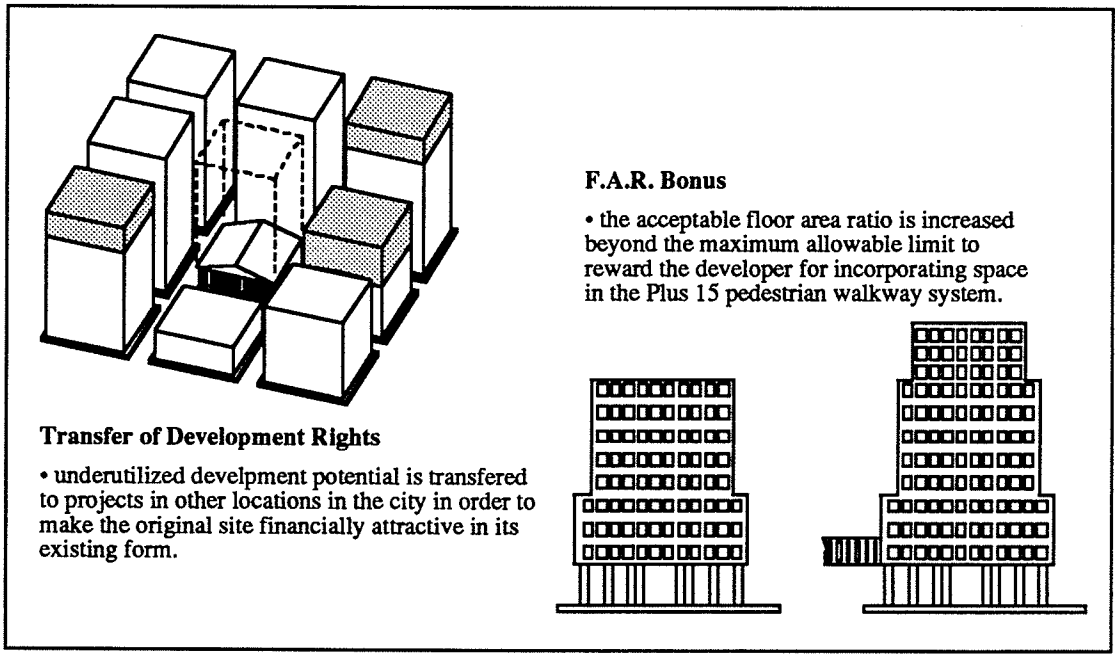


Figure 7.7). For example, where an architecturally significant five storey building occupies a piece of property that could potentially be developed to fifteen stories, it is possible to transfer the rights to develop the unused portion of air space to other sites in the city. This reinforces the market potential of the heritage building since an investor is able to recover the earning potential associated with the unused space in return for occupying and operating the existing structure. Municipalities generally target preservation areas and identify transfer areas that apply to this type of incentive arrangement. In contrast, FAR bonuses reward developers with floor area incentives beyond the maximum levels specified in the pertinent zoning by-law in order to encourage them to include public spaces or amenities within the project's architectural program (See Figure 7.7). As was the case for TDRs, the usual practice is to identify and categorize which amenities qualify for the bonus increments. Some typical applications of the FAR bonuses have included the promotion of plaza spaces, extending a segment of a plus 15 pedestrian walkway, or for upgrading architectural surfaces and construction methods.

Zoning incentives give urban design planners the ability to introduce pro-active design programs without significant additional costs or administrative procedures. This is a distinct improvement upon the traditional regulatory approach to land-use zoning. It both complements the legally required development standards and works to promote more effective design proposals. These incentives are useful in yet another way. Because their implementation requires the ongoing commitment of both parties, there is potential for planners to become involved in the design process at an earlier stage than is likely without their introduction. This contact affords the planner with an opportunity to have input into the actual content of the design proposal thereby enhancing its congruence with area-wide design policies.

7.1.2.8 Project initiation and management capabilities

Some jurisdictions have the authority to initiate and manage specific design projects.

This approach is used most often for high profile developments that require substantial public commitments for capital investment and ongoing maintenance once they are completed. In terms of overall effectiveness, this type of design planning creates operational efficiencies that bring financing, design, and implementation roles together for the life of the project. This ensures that planning objectives will be uniformly interpreted and applied to create a comprehensive design scheme for the entire site. Unfortunately, this approach has been criticized by many designers since opportunities for public consultation and public participation are not often acceptable for generating findings that are representative of the community at-large. Where the scale of the project is broad enough to effect a large sector of the resident population, the effects of this type of inefficient participatory process can be devastating. Recent demonstrations that have protested the management of the Forks Development in Winnipeg attest to the sensitive balance between control and accountability that is required for this type of planning to be effective.

On a smaller scale, some municipal governments have the ability to control the design impact of municipal expenditures for public infrastructure and facilities. This proprietary responsibility of government can play a signifying role in improving the appearance of the urban environment when it is exercised effectively. This requires the ongoing support and commitment of local politicians and the public with respect to responsible purchasing and maintenance practices of civic departments. Key players in this management process in some cities include streets and transportation, public works, and recreation departments.

7.1.2.9 Financial incentives and property tax abatement schemes

Another mechanism that can be used to encourage wide scale participation in design-related development programs are financial incentives. These incentives are provided in two basic forms.[5] The first is a straight cash contribution that can be used to pay for professional design fees or construction costs. This approach can be very successful in situations where there is an expressed commitment to the principles of a design program but where the

additional costs of compliance are prohibitive to property owners. Additional funding in this situation represents a shared interest in the project allowing it to proceed in accordance with the stated requirements of the finance package. This approach requires careful consideration of incentive amounts and participatory contributions that property owners are required to pay so that the necessary incentive potential remains a viable one.

The second form of financial incentive is to provide assessment relief, tax deferral, or tax exclusion programs for the structural maintenance and upgrading of older buildings. This approach has been used almost in almost all jurisdictions to promote heritage resource redevelopment and preservation (Hodge, 1986). Tax abatement schemes are effective incentives where the increased assessed value of a project as a result of design improvements will cause an inordinate increase in the property's total tax bill. This increased tax burden threatens the building owner's ability to continue occupying the structure thereby further jeopardizing its long term preservation. By assessing the property at a depreciated value or deferring the magnitude of tax increases over a period of time, the attractiveness of full scale revitalization is enhanced. As was the case for all other types of incentive schemes, it is necessary that a clear statement of the costs and benefits associated with participation in tax relief programs is made in order to preserve their effectiveness.

7.2 The urban design review process

In spite of the all the planning tools that have been developed, it is impossible to legislate high quality design short of requiring designers to subscribe to specific architectural models by way of rigid prescriptive guidelines and by-laws. Even this approach to design planning cannot anticipate all of the possible exceptions to accepted design "rules" that may appear to challenge an urban area's stated planning objectives. Similarly, it is not likely to recognize the unique or innovative proposals that result as a part of a considered appreciation of the goals themselves. "However cleverly the controls have been structured, designers have demonstrated an uncanny ability to technically meet every requirement and still evade the

spirit of the underlying design objectives" (Hedman & Jaszewski, 1984, p. 136). As a result, there is room for a process that works to instill this design "spirit" into all design proposals at every possible opportunity.

Design review procedures have been defended by many architects and planners as this type of "essential component" for urban design planning (Shirvani, 1985, p. 182). They are intended to establish a due process of consideration with respect to the qualitative impact of physical development projects on the urban environment. Design review operates alongside of the normal evaluation procedures associated with development control. The difference is that design review considers the impacts of a particular proposal on the areas surrounding the actual site location and the larger urban region. It serves as a forum for reconciling project and planning objectives to maximize the qualitative benefits of each project in addition to minimizing the effects of weak environments that result from inattentiveness to local needs.

Structurally, design review can take a variety of forms. The most successful review procedures begin with a pre-design conference that initiates a series of ongoing consultations with municipal planners, architects, and the developer. Ideally, the intentions of all interested parties for the project site can be identified at this stage and maintained throughout the development process. Where substantial incongruencies are immediately apparent, the usual negotiations associated with development control can be fitted into the review mechanism to provide zoning incentives, financial assistance, or other forms of support. Similarly, the standard regulatory restrictions that apply to the project can be introduced at this point in the review cycle. Once the project proposal is finalized, it is possible to enter into a broader investigation of its merits with respect to various design principles or requirements. This typically involves further analysis of the project by auxiliary consultants or municipal urban design staff. The objective of these investigations is to provide a qualitative assessment of the final project proposal in addition to highlighting its strengths and weaknesses. This information can then be turned over to the appropriate decision making authority for approval or dismissal on firmly documented grounds.

Hedman and Jaszewski (1984, p. 136-137) suggest the following prerequisites to a successful design review process:

1). Design objectives should be clearly stated so that all parties know which criteria will be applied to a project in advance.

2). The direction of the review process should remain consistent (with minor adjustments) for a considerable period of time.

3). Urban design concerns should be the primary guides to design review so that architecture can serve as a resolution of urban design objectives.

4). The basis for exceptions should be clearly spelled out and open to public scrutiny.

5). Design review committees should be as small as possible to foster the maintenance of a strong vision and still afford the group the ability to operate effectively with a variety of architectural styles.

The emphasis here is placed on establishing a consistent and fair process of review for all parties. This sentiment has been supported by many practitioners in the field (Barnett, 1974, 1982, 1987; Clark & Couture, 1990; Salazar-Rios, 1986a, 1986b; Shirvani, 1981, 1985; von Hausen & Robinson, 1991).

Very little effort has been directed at assessing which analytical techniques are most well suited for the purposes of evaluating design proposals during the assessment phase of the review process. It is sufficient to note, however, that analyses emphasizing graphic representation and visualization of the project proposal have achieved general consensual support in most jurisdictions. Conceptual renderings, perspective drawings, photomontage transfers, and three-dimensional modelling are some of the most commonly utilized techniques for these purposes. Advances in computer technology and animation software have greatly enhanced visualization capabilities and will continue to have a lasting impact in this area (Perron, 1990).

7.2.1 Elements of design review

Throughout the design review process, basic investigations are carried out to evaluate the performance of the proposed project with respect to specific *design elements.* Shirvani (1985) differentiates these design elements into two distinct categories – measurable and non-measurable criteria. *Measurable* criteria can be captured by quantitative analysis and appraisal. In real terms, they reflect the physical environmental effects associated with a specific development project. Examples of this type of design element include:

1.) environmental and ecological impacts (i.e. affected wind patterns, snow accumulation, access to sunlight, shadow paths, proximity to critical habitats, surface drainage and groundflow...);

2.) planning and development regulations (i.e. land-use, loading and service space, parking space, F.A.R., bulk, height, site coverage,...); and,

3.) implementation and financial considerations (i.e. project cost, length of construction period, economic benefits,...).

The qualitative effects of the design scheme, on the other hand, are addressed as *non-measurable* criteria. Theses design elements qualify the ambient personality and character of the design proposal; its effects on the contextual environment surrounding the site. Common examples of non-measurable design criteria include:

1.) architectural character (i.e. building scale, style, interior/exterior compatibility, program parameters,...);

2.) visual interest (i.e. facade details, materials, color scheme, surface articulation,...);

3.) liveability (i.e. safety, surveillance opportunities, amenity space, "friendliness", variety, diversity,...); and,

4.) spatial compatibility (i.e. contribution to street, contribution to open space system, harmonizing features,...).

Figure 7.8 illustrates the range of design review elements that have been applied in

Figure 7.8 - Design elements that are frequently considered during the review process.

City	Compatibility					External Effects						Architectural Issues						Environmental Impact		
	Location	Land-use	Bulk, Height	Streetline	Site Coverage	Access, Parking, Loading & Service	Landscaping, Paving, Signs	Surveillance	Amenities, Recreation Space	Scenic Vistas, Views		Scale, Style	Roof Cornice	Awning, Porch, Projection	Arcades, Stairs	Building Material, Color	Facade Details	Sun Access, Shadows	Wind Patterns, Flows	Ecological Impact
Boston, MA	●	●	●	●	●	●	●		●			●			●			●	●	
Brandon, MB	●	●	●	●	●	●	●			●		●	●	●		●	●			
Calgary, AB	●	●	●	●	●	●	●											●	●	
Edmonton, AB	●	●	●	●	●	●	●			●		●				●				
Minneapolis, MN	●	●	●	●	●	●	●		●			●							●	
Moose Jaw, SK	●	●	●	●	●	●	●			●		●	●	●	●	●	●			
New York, NY	●	●	●	●	●	●			●									●	●	
Ottawa, ON	●	●	●	●	●	●	●		●	●				●		●				
Portland, OR	●	●	●	●	●	●	●			●		●	●		●	●		●	●	
Regina, SK	●	●	●	●	●	●						●	●	●	●	●	●			
San Francisco, CA	●	●	●	●	●	●	●		●	●		●	●	●	●	●		●	●	
Saskatoon, SK	●	●	●	●	●	●														
Scottsdale, AZ	●	●	●	●	●	●	●		●	●		●	●	●		●		●	●	
Seattle, WA	●	●	●	●	●	●	●			●		●		●	●			●	●	
Toronto, ON	●	●	●	●	●	●						●		●	●			●	●	
Vancouver, BC	●	●	●	●	●	●	●		●	●		●		●	●	●		●	●	●
Victoria, BC	●	●	●	●	●	●	●			●		●	●		●	●	●			
Winnipeg, MB	●	●	●	●	●	●			●	●		●	●	●	●	●	●		●	

Source: Adapted from Shirvani (1981, 1985). Additional information compiled by the author from various sources.

various urban municipalities. Clearly, this figure attests to the influence of zoning by-laws on the contemporary practice of urban design. Without exception, the standard control mechanisms associated with these ordinances have been incorporated into the design review process. In contrast, there is considerable disparity between the various jurisdictions with respect to the remaining key design elements. Most municipalities have preferred to concentrate on the specific architectural features of proposed developments in addition to giving limited consideration to potential environmental impacts.

This figure also points to the central limitation of contemporary design review procedures. It relates to the previous distinction of measurable and non-measurable design criteria. In no uncertain terms, review procedures are biased towards a consideration of design elements that have *measurable* physical effects. Paradoxically, these parameters are likely to be most useful when they are augmented by a sustained deliberation of the project's less

material impacts. For example, an assessment of sun access and shadow distribution is only valuable in terms of some larger dimension of micro-climatic suitability or environmental liveability. The basic problem is that the conventional development process disaggregates the relevant design-related information into uniform criteria that do not clearly accommodate the assessment of higher order design achievements. This problem is perpetuated by the misrepresentation of the intentions associated with the design review process in the pertinent empowering legislation and civic by-laws. Qualitatively, design review is treated in the law solely as an enforcement mechanism and not as a long range planning tool or decision making aid. Design review procedures must be based on defensible assessment criteria to avoid ongoing disputes from this perspective. Unfortunately, this often necessitates utilizing uniform evaluation standards in the place of multi-dimensional parameters that can be subjected to a wider interpretation.

7.3 Synthesis: Manageable, enforceable, and effective urban design

Widespread interest in the relationship between urban form and the liveability of urban environments at the practitioner's level has served to underline the urgency that pervades the urban design planning field. This can be easily attested to by the increasing number of conferences and professional development programs that have been focussing on this area.[6] Their purpose has been to consider the longer term consequences of previous approaches to planning in order to redress and avoid the critical problems of the past. "The institutionalization of urban design, through its incorporation into the city's administrative framework, remains a key to [this type] of urban design success. It is clear that the critical issue of urban design is 'how to administer it'" (Shirvani, 1985, p. 158).

The establishment of an effective urban design strategy that provides the necessary guidance, organizational mechanisms, and implemental tools has been the goal in many instances. "Zoning regulations and the development-approval process affect what gets built, where, how big, the relationship of buildings to the street and the amenities provided.

Planners in drafting such regulations, whether they realize it or not, are determining the form of the city." (Palermo, 1990, p. 48). While this may be the case, it is equally apparent that the current administrative and regulatory environments are severely inadequate for the purposes of attaining even higher levels of success. Efforts to strengthen the less definite environmental characteristics that seem to make the largest contribution to the total urban experience seem to be achieved in spite of the established regulatory planning environment.

This systemic inefficiency can be explained for the most part by examining the relationship between the implicit operational expectations of all urban design programs. From the previous discussion, it is clear that urban design practice is predicated on four basic principles – control, enforcement, management, and innovation. Both control and enforcement mechanisms are extremely well established as a part of the development approval process. Functional zoning by-laws articulate enforceable regulations that can be easily measured and consistently applied. The problem is that current urban design planning programs have under-represented their management and innovation roles; that is, the longer term planning functions associated with policy translation, strategy development, and creative investigation. This problem has manifested itself at several levels.

For example, urban design review has sometimes been exclusively confined to an assessment of the effects associated with specific formal elements, architectural details, and stylistic choices made by the designer. While this type of assessment is often indicative of the larger shortcomings contained within a particular proposal, it is not very useful in determining the appropriateness of the project for its site, immediate neighbourhood, or the larger urban environment. From an urban design planning perspective, the review process should focus almost exclusively on these larger implications. Where a mutual appreciation of objectives cannot be reached by all parties, enforcement and control mechanism should serve to minimize the effects of a poor proposal by requiring specific minimum standards. Similarly, incentive mechanisms could also be used to maximize the qualitative impact that a project can have in its particular context. In this way, design review procedures can be

removed from the development control process and still remain actively integrated with it.

The evaluative tools and mechanisms that are employed in the review process also reflect this enforcement bias. For example, environmental testing assesses degrees of sustained impact that can be contrasted to well defined standards while at the same time bulk and height restrictions can be easily evaluated for compliance. The lack of comprehensive procedures for testing and contrasting design proposals contributes to this problem. What seems to be indicated as a means of rectifying this situation is the realignment of the urban design process with the larger planning environment. Clearly, this involves mediating the interests of different problem scales and modes of thinking. To achieve this type of system requires

> "... a sequence and a partnership of skills – commencing with planning, developing into urban design and proceeding to architecture. The more understanding which exists between the skills, the better the product. The more clearly the experts on the planning team can anticipate the likely three-dimensional implications of their planning policies, the more likely they are to vary those policies in the interest of creating the most liveable and beautiful city." (Spaxman, 1990, p. 11).

Long range goals and objectives represent the most valuable criterion for evaluating development projects in these terms. They are reflective of specific environmental themes and the compatibility of different forms of development. Similarly, they attest to the identity of the urban place and the necessary steps that are required for strengthening it. This reinforces the assessment of a project's compatibility with the overall development program for the city. In as much as reference to specific architectural features is necessary, there should be a concerted effort placed on their qualitative contribution to these larger dimensions of design suitability. Administered within an effective review process that recognizes the complementary responsibilities of enforcement and planning, this type of review criteria is likely to produce significantly better results than are being achieved at present.

7.4 Chapter summary

This chapter has approached urban design as it is represented by the regulatory planning environment. This has included assessing the effectiveness of important policy implementation tools and the operating philosophies of specific urban design programs. An in-depth exploration of the pertinent factors associated with proposal assessment during design review was also completed.

The most significant finding is that a concerted emphasis has been placed on the development control and regulation component of the urban design planning process in almost all jurisdictions. While this aspect of planning practice is necessary and even desirable, this over-emphasis inhibits the attainment of higher degrees of success in urban design planning. Key inadequacies associated with this problem are the procedural orientation of empowering legislation and by-laws, deficient design review criteria, and the absence of an effective review process that connects planning and physical design objectives.

Notes

[1]The findings developed in this chapter are the result of an ongoing analysis of existing urban design programs in North American cities that began in 1985. The sample subset of eighteen (18) cities was determined on the basis of information availability. It is intended to be loosely representative of the range of urban design programs that have been implemented in cities of various sizes in both Canada and the United States. The interpretation and categorization of this information has been carried out in a manner that provided for the comparison of a large number of urban design programs at a fairly high degree of generalization. Other researchers have set the stage for this type of examination by presenting detailed comparisons and descriptions of specific urban design programs using a case study approach (See for example, Barnett, 1974, 1982; Mandryk, 1989; Salazar-Rios, 1986a, 1986b; Shirvani, 1981, 1985). Interpretive errors and omissions are the sole responsibility of the author.

[2]The purpose of this chapter is *not* to quantify the successes of specific urban design programs from jurisdiction to jurisdiction. This task is far beyond the scope of this chapter and is not necessarily productive given the focus of the thesis itself. I do, however, reserve the right to comment on the merits of certain approaches and techniques in general, as a means of communicating more clearly those aspects of the urban design review process that were considered important while developing the project assessment model.

[3]For an overview and description of this project see Fisher (1988a, 1988b).

[4]One exception is Houston, Texas which has no zoning by-laws or development ordinances and considers all development procedures on a case by case negotiation basis. This is a formalized procedure for use in identifiable "Development Control Districts".

[5] A complete discussion of the full range of individual financial incentive mechanisms is beyond the scope of this thesis. The basic approach has been to utilize tax incentives or simple cash incentives. It is important to recognize, however, that the United States Department of Housing and Urban Development (H.U.D., 1983) identified no less than 16 individual incentive techniques falling into these two categories. They are: General Obligation Bonds, Revenue Bonds, Transient Occupancy Tax, Special Assessment, Tax Increment Financing, Innercity Value Estimation Models, Tax Abatement, Tax Exemption, Tax Exclusion, Income Assessment, Land Buy Backs, Community Investment Funds, Equity Participation Loans, Municipal Loans, Revolving Loan Funds, and Capitalizing Non-profit Groups.

[6]For example, both the 1990 Canadian Institute of Planners and the 1991 Canadian Association of Planning Students national conferences had substantial urban design program components focussing on urban image and its development through design and planning. Similarly, the 1991 American Planning Association conference held in New Orleans concentrated on form-giving, architectural expression, and urban design.

PART V

The Model

Models are commonly understood as representations – formulas, diagrams, or schemes – that are employed to describe or explain relationships. They can be either static or dynamic, simple or complex. Regardless of their form, all models share the universal characteristic that they simplify some part of reality by limiting the dynamics of the real world environment to a comprehensible scale of investigation. *Planning* models, as a sub-set, "...incorporate some criteria against which alternative futures are tested, to discover which one should be preferred" (Roberts, 1974, p. 95). They assist in the evaluation and measurement of specific phenomena given some understanding of the factors which contribute to the nature of the environment. Planning models reinforce our appreciation of the future consequences that can be associated with specific courses of action or key policy decisions. In real terms, this type of evaluative model helps to bring home the reality of both well-contrived plans and inspired planning visions.

CHAPTER EIGHT

A Review Framework Connecting Urban Design Theory and Practice

"The problem is to distinguish between two questions: What would we like to achieve? and How shall we best achieve it?"

– Earl Levin, 1962

"The vast majority of problems and situations which confront us daily do not have just one answer. Several solutions are usually possible. Logic suggests that if one can mentally generate many possible solutions, the more likely it is that an optimum solution will be reached. This is a creative process – the formation of new and useful relationships."

– Richard E. Manelis, 1975

It is impossible to study things like picnics and find a physical law that explains each one to the same degree of certainty. This is because each individual event (i.e. a church picnic, family gathering,...) is uniquely defined by several distinctive characteristics (i.e. the number of participants, the location, the types of food,...). A similar observation holds true with respect to the practice of urban design. While it may be possible to systematically determine which factors contribute to the success of an individual design proposal, it would be a mistake to interpret these findings as laws which govern all design in the general case. To varying degrees, it is this weakness that has impaired most efforts to establish effective design review procedures – evaluative *rules* cannot be found since the *cases themselves* are not physically united. Individual proposals are set in different geographic locations and respond to unique environmental conditions and socio-cultural circumstances. They also have considerably different implications for the ongoing development of the urban place. In order for design review to become more effective, it is necessary to have an operational

framework that connects broader parameters of evaluation with design proposals on a case by case basis.

8.1 Re-examining the problem[1]

The preceding chapters have shown that contemporary urban design practice can be characterized by several basic realities. For example, it has been demonstrated that individual architects and planners seem to utilize the same basic set of creative investigation techniques to *solve* all design problems. Similarly, it has been shown that they tend to rely on a fairly uniform set of basic assumptions which describe those factors that contribute to the structure of dynamic spatial environments. They focus on particular environmental cues, the needs of specific user-groups, and important regulatory restrictions as well as holding personal opinions about aesthetics and design technique. At a more general level, urban design practice can be shown to have a definite procedural structure and scope of interest. It is unquestionably focussed on translating larger planning goals into reinforcing actions at the local urban scale. This involves establishing specific policy programs and carrying them out within the established regulatory environment. Effectively, this forces the urban designer to make linkages between planning policy and individual physical design projects in order to bring about effective changes to the physical form of the urban environment. When taken together, it is evident that these realities form the basis upon which most urban design planning decisions are made. They shape the structure of all design-related planning programs and largely impact upon the relative levels of success that can be attributed to urban design planning as a whole.

The real limitations of this operational environment are, perhaps, most evident in the urban design review process. Established design review procedures are often solely focussed on the aesthetic qualities and architectural characteristics of design proposals. Similarly, they concentrate on those environmental impacts that can be quantitatively defined and measured for the purposes of regulation. The cumulative impact of this bias is that the process of design

review has continually been viewed as an instrument of development control while its corresponding role as a *planning* or *decision-making tool* has been neglected (Jain & Hutchings, 1978; Lozar, 1974; Roberts, 1974; Robinson, 1985). Consequently, most design review procedures are inadequate for the purposes of expressing or analyzing the larger qualitative impacts of design proposals for the urban environment. As has been noted in Chapter Five, this is an unfortunate reality since these qualitative changes seemingly make the largest contribution to a city's overall liveability and healthfulness (Duhl, 1989; Witty, 1990). In addition, they are often more in line with the expressed interests of the wider community as they can be defined in social, physical, aesthetic, or ecological terms.

These inefficiencies in the urban design review process are complicated at the practical level by the absence of an analytical tool that unifies distinctive environmental factors, local socio-cultural priorities, and urban design theory as effective assessment criteria. Many attempts to rectify this situation have been pursued in the academic world. For example, Jacobs and Appleyard (1987), Alexander (et al., 1977, 1979), and Trancik (1986) have each developed unique dimensions of urban design planning performance that could be re-defined as acceptable project evaluation parameters. Recall, however, that the philosophical bias of most of these models causes them to have little tangible identification with the realities of urban design practice. Similarly, it is important to remember that the terminologies that have been employed to develop these models are both insufficiently substantiated by real-world experiences and imprecise in their meaning or intent. Consequently, they remain effectively inoperable as viable planning tools, while at the same time, retaining their importance as statements of planning and design objectives upon which some level of general agreement has been reached.

The research has shown that to be truly effective, an urban design assessment mechanism must be able analyze, interpret, and evaluate individual design parameters as they contribute to the impact of the entire proposal on the surrounding environment. This type of evaluation process depends on a distinctively different approach than that employed in most jurisdic-

tions at the present time. It was demonstrated in Chapter Seven that the majority of review procedures have been developed to evaluate the *compliance* of a proposal with specific "objective" design criteria. This necessitates an analysis of the project proposal solely in terms of its *internal merit.* In contrast, a more effective approach to project assessment would focus on a project's *performance* with respect to important *external criteria* (Bloom, et al. 1956; Roberts, 1974). From an operational perspective, this change in emphasis moves the basis of evaluation away from the value of the design proposal as a skillfully crafted *work of art* towards an appreciation of the *project's implications for the environment in which it will be located.* This is a higher level process of evaluation that depends not only on the strength of the proposal in isolation, but also in terms of the site and local environment as well. At this level of understanding, the important question that must be asked is "What are the most appropriate and effective type of assessment criteria in a design review situation?"

8.2 A project assessment model for urban design review[2]

The preceding discussion has recognized that in order for it to be truly effective, any urban design review procedure must work towards an appreciation of the potential impacts associated with a given design proposal . Developing an assessment tool that is practically applicable in this context is an extremely difficult task. The significant challenge that must be met is *to provide a set of review criteria that connects specific design attributes with planning policy and urban design theory while still retaining its relevance as an aid to the decision-making process.* These design review attributes should be fairly independent of each other in addition to operating at the same level of generalization. This reduces the possibility of unexplainable interactions between attributes thereby establishing a common basis for their interpretation and application in design review (Lynch, 1984). Furthermore, these assessment criteria should be fitted into some type of dimensional structure that is sufficiently general in its scope to bridge the gap between the process and product orientations of urban design planning. Where possible these dimensions should be represen-

tative of uniform "transpatial" qualities that contribute to the liveability of urban environments (Hillier, 1976; Hillier & Hanson, 1984). Substituent requirements include providing a comprehensive measurement system that can be augmented by project visualization techniques or other relevant analytical procedures.

The motivation for constructing this type of assessment model is to create a review mechanism that encourages the continuous exploration and re-evaluation of development and/or re-development proposals, both in their initial stages, and after revisions have been made. Through this process of assessment and revision, it is possible to test the relative merits of particular design solutions at extreme levels until their viability as development options *breaks down*. At this point, the particular proposal can either be abandoned or revised until it is more appropriate given the character of the site and its environs. This type of design review tool avoids the style driven mechanics of design that have been criticized so often in the past for their insensitivity to the dynamics the existing urban environment. Instead, planners can work to proactively incorporate the interests of the wider community in an effective design review process that has a more suitable basis for evaluation – that which is integral to the unique identity of the urban area and which emphasizes the complementary nature of adjacent developments.

8.2.1 The Project Assessment Model (PAM)

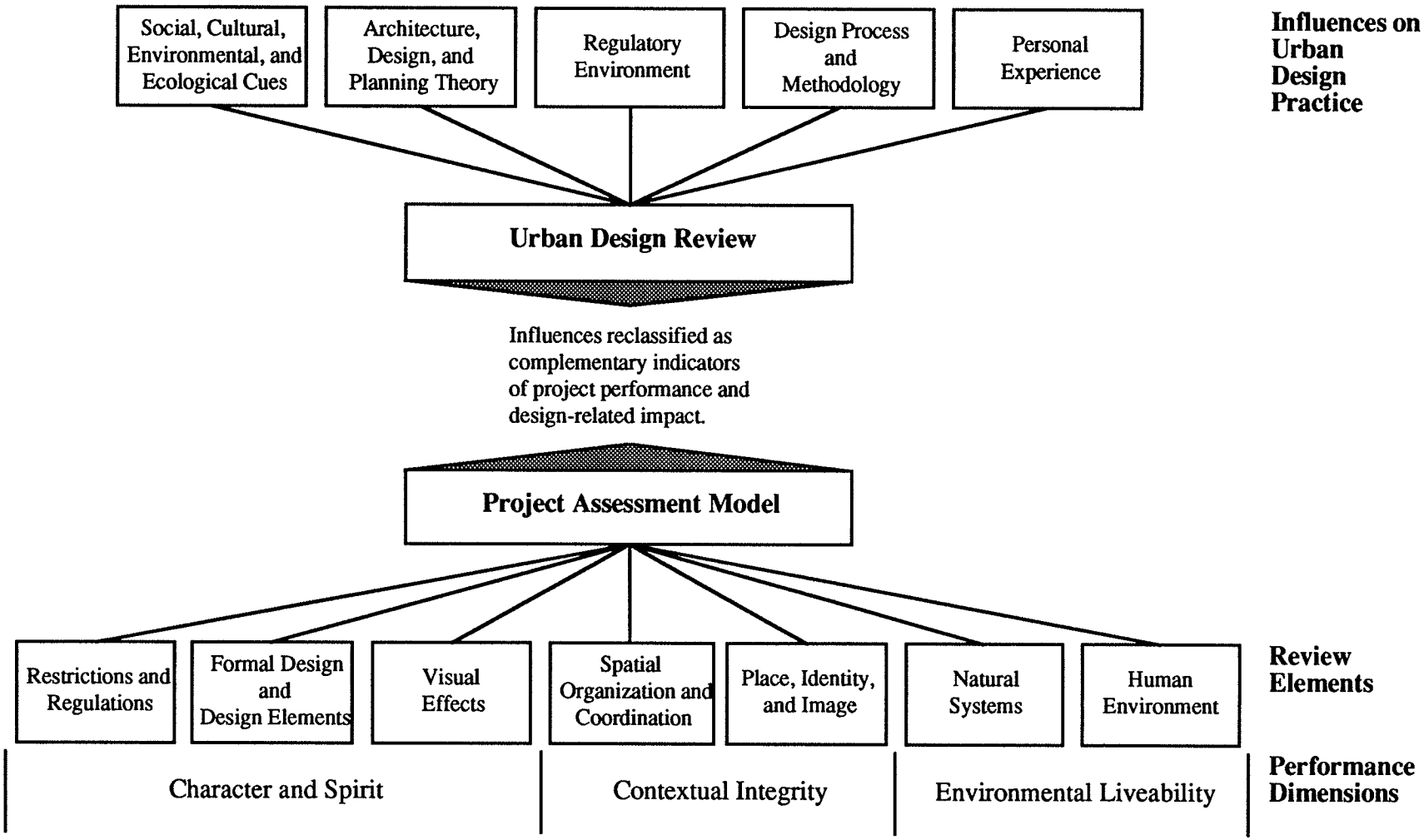
The research has clearly shown that the qualitative impacts of a development project are often under-represented in the parameters of evaluation that are used in the contemporary design review process. In most cases, an investigation of these intangible effects has been supplanted by a less comprehensive assessment of a project's measurable effects in visual, architectural, or physical terms. The Project Assessment Model presented in this section has been developed as a response to the real inadequacies that have been attributed to this type of design review process. They stem from the relative inability of designers to operationalize these qualitative design attributes in a form that facilitates their comparison and measurement

with respect to the specific parameters of a development proposal. As a response, the PAM has been structured as a preliminary framework that begins to recognize the complementary nature of these qualitative design attributes to the more widely accepted review criteria. The components of the model itself have been developed in response to the discussion in the previous chapters. To the extent that it was necessary to define these components in order to present and describe the model in its entirety, they represent one interpretation of the key themes or concerns that have been shown to inform urban design practice. *It is expected that they will necessarily undergo substantial revision and refinement prior to their application within a practical design review process.*

It was necessary to conceptualize the process of design review as a unified decision-making complex as a means of developing a workable project evaluation model. This decision-making complex is structured by the competing interests of those areas that have been show to have a significant influence on urban design practice. From this perspective, the primary obstacle that had to be overcome is the seeming incompatibility of the demands created by each of these areas with respect to project evaluation. Each of them points to the relevance of different sets of evaluation criteria in addition to having implications for the operational mechanics of the review process itself. By viewing these demands as complementary indicators of project performance, however, it was possible to develop a dimensional structure that relates basic design attributes to a broader interpretation of design-related impact.

Figure 8.1 illustrates the end result of this conceptual model development process. Here, the formative influences of socio-cultural and environmental cues, substantive design theory, design methodology, personal experience, and the requirements of the regulatory planning environment have been re-organized to produce seven integrated design elements – *Restrictions and Requirements*; *Formal Design and Design Elements*; *Visual Effects*; *Spatial Organization and Coordination*; *Place, Identity, and Image*; *Natural Systems*; and, *Human Environment*. Each of these design elements represents a fairly independent class of review

Figure 8.1 - Conceptual development of the Project Assessment Model (PAM).



criteria that can be rated on a standardized measurement scale. These review criteria will be defined and discussed in Section 8.2.1.2.

The seven design elements were then further sorted into three dimensions of urban design planning performance – *Character and Spirit*, *Contextual Integrity*, and *Environmental Liveability*. These performance dimensions are intended to approximate transpatial environmental characteristics that contribute universally to the quality of all urban places. They reflect the suitability of vibrant, connected, and healthful urban environments that support all life and human activity as parameters of design-related success. The validity of these urban design objectives is well supported in both academic and practice-based research. At another level, these performance dimensions were developed to correspond with the basic levels of impact that can be attributed to any potential development project. These have been identified as *internal aesthetics* at the project level, *relational aesthetics* at the neighbourhood and community level, and *environmental aesthetics* of the total affected environment, respectively (ASLA, 1981, p. 5-6).[3]

Two other observations can be made with respect to the conceptual development of the Project Assessment Model. First, it is evident that the PAM does not adopt the common practice of categorizing the impacts of a development project into dimensions based on their relative social, physical, or economic effects (Jain & Hutchings, 1978). An attempt has been made to develop assessment parameters which are uniquely matched to the requirements of the urban design review process. This approach stresses the inter-relationship of the individual project proposal to the overall development of the urban place. As a result, the key design attributes included in the model that seem to be highly irregular for the purposes design review are in fact, representative of an alternative conceptualization of design-related impact based on *the liveability of the total urban environment.*

Second, the PAM as it has been presented is not strictly an *evaluative model.* It is not intended to be used as a precise measurement system by which development proposals can be categorically "measured" with respect to a number of well-defined criteria. Clearly, the

assessment of qualitative attributes can never be reduced to an exact science. Furthermore, it is even arguable whether the measurement of the various design attributes contained in the PAM is possible beyond a relative assessment of "less" or "more" (Lynch, 1984 , 1990). To the contrary, the PAM establishes a basic methodology which begins to make it possible to consider how a design proposal may effect the total urban environment. Hence, the identification of specific design attributes and the provision of a workable scoring methodology serve only to facilitate the examination of a project's merit in reference to this larger planning construct. The need for this type of *heuristic reasoning device* is well documented and should contribute to the further development of more effective design review procedures in the future.

8.2.1.1 Model structure and scoring procedure[4]

The Project Assessment Model (PAM) has three major components that correspond to each of the performance dimensions that were identified in the last section. Part I (Character and Spirit) is intended to measure how well the design proposal can be interpreted as a unified, workable, and vibrant design solution. It is made up of three design elements – *Restrictions and Requirements*, *Formal Design and Design Elements*, and *Visual Effects* – with a cumulative total of 17 review criteria. In contrast, Part II (Contextual Integrity) represents the degree to which the design proposal incorporates the intrinsic qualities of the surrounding environment. It is made up of two design elements – *Spatial Organization and Coordination*, and *Place, Identity, and Image* – with a cumulative total of 19 review criteria. Finally, Part III (Environmental Liveability) indicates the degree to which the design proposal enhances the total affected environment as a vital and healthful place for living. It is made up of two design elements – *Natural Systems* and *Human Environment* – with a cumulative a total of 9 review criteria. A tabular summary of the PAM illustrating the review criteria that make up the respective design elements and performance dimensions can be found in Appendix A.

Efforts have been made to carefully define each of the review criteria to preserve clarity

in both their structure and meaning. This was a substantial task that involved not only the identification of the design attributes themselves, but also an exploration of their essence or *intent*. Furthermore, a conservative stance has been taken with respect to the wording of the definitions themselves. In this sense, each of the attributes have been defined as if it was necessary to retain or extend their respective qualities to improve the suitability of any urban design project. It is a simple matter to re-classify these definitions to suit more aggressive urban design interventions where this need has been expressed.

A weighting system has been built into the PAM so that the individual performance dimensions, design elements, and review criteria can be priorized to match their relative importance for the design review process. This weighting system was developed to respond to the concern held by many practitioners that evaluation models and review criteria are often inappropriately matched to the real cultural, social, historical, political, and environmental circumstances of the areas in which they are applied (Ndubisi et al., 1984; Scott, 1982; Smith, 1981; Sneddon & Theobold, 1986; Ward, 1987; Weidemann, 1989; plus others). As a result, these evaluation models only represent a generic measurement of project suitability in terms of transplanted design attributes. By focusing the PAM on locally-determined priorities through this type of calibration procedure, however, it is expected that the results of the review process will be more accurately reflect these local conditions. Furthermore, this weighting procedure strengthens the adaptability of the PAM to a wider range of review situations.

On this basis the total assessment score for a development proposal – its *design-related impact* – is equal to the sum of the performance rating for Part I multiplied by the importance weight attached to Part I, plus the performance rating for Part II multiplied by the importance weight attached to Part II, plus the performance rating for Part III multiplied by the importance weight attached to Part III. Similarly, the performance rating for each dimension of the PAM is determined by the sum of weighted design elements in each part which are in turn calculated by the sum of weighted review criteria scores for each design element. For

example, the performance rating for Part III (Environmental Liveability) is calculated by totalling the weighted values of the two design elements "EL1. Natural Systems" and "EL2. Human Environment". In contrast, the total for design element "EL1. Natural Systems" is calculated by multiplying the proposal's score on the five pertinent review criteria – "Environmental factors", "Water", Natural vegetation", Wildlife and habitat zones", and "Operating ecology" – by their respective importance weightings.

The mathematical formula which describes the Project Assessment Model is

$$S_l = \sum W_i \sum V_{ij} \sum Y_{ijk} \times U_{(ijk)l}$$

where:

S_l	is the total assessment score of Proposal l
W_i	is the weight of Performance Dimension i
V_{ij}	is the weight of Design Element j of Performance Dimension i
Y_{ijk}	is the weight of Review Criterion k of Design Element j of Performance Dimension i
$U_{(ijk)l}$	is the score of proposal l on Review Criterion k of Design Element j of Performance Dimension i.

Two additional conditions improve the workability of the Project Assessment Model in terms of this mathematical formula. First, the measurement scale for the individual review criteria is set from 0 (the proposal's performance is the worst for that attribute) to 100 (the proposal's performance is the best for that attribute). Second, the sum of importance weightings for each level in the model should be set to equal one (1). These restrictions ensure that the total assessment score for the project (S_l) will always range from 0 (the proposal performed at the worst level for all review criteria) to 100 (the proposal performed at the best level for all review criteria). This type of hierarchical additive model has often been employed for the purposes of impact assessment in many fields of study (Cats-Baril, 1986, 1987; Lozar, 1974; Jain & Hutchings, 1978; Roberts, 1974).[5,6]

The 100 point scoring scale has been augmented with descriptive adjectival labels and

phrases that have been dedicated to each pole and the mid-point of the scoring range for all review criteria.[7] The mid-point (50) label in each of these instances represents a neutral or moderating impact. In contrast, a "0" score represents a poor or degrading impact and a "100" indicates a positive or enhancing impact with respect to each review criterion. These interpretations can be extended to the total assessment score that is achieved for any given design proposal.

The scoring procedure utilizing the PAM proceeds according to the following steps:

1). The reviewing body (i.e.. an individual or group) assigns the relative importance weightings to each of the model components ensuring that the sum of weightings for each level – performance dimensions, design elements, and review criteria – is set to equal one (1). Care should be taken to make sure that these weightings reflect the true priorities of the individual assessor, the community, or the public at-large for the specific site area. These priorities can be identified through an exploration of key issues using survey or interview techniques as well as from the comprehensive interpretation of important planning goals contained in strategic development plans or guidelines. Where a component of the model is not likely to have a significant role in determining the overall impact of a specific proposal, its weighting can be set to zero (0).

2). All relevant documentation associated with the design proposal including perspective drawings, plans, the user-needs program, financial plan, environmental impact statements, and transcripts from public representations in support and opposed to the project should be analyzed. This stage is intended to help the reviewers develop a base level of understanding from which it should be possible to "grade" the proposal on each of the review criteria. The intent is not to provide a definitive measurement but rather to make an educated personal evaluation based on the available information. Where insufficient information is provided for these purposes, complementary analytical tech-

niques that point to some key indicators of success for each review criterion can be carried out. Some important analytical techniques in this respect are identified in the Section 8.2.1.3.

3). The proposal is graded on each review criteria according to the established assessment scale. A complete scoring summary sheet is provided for this purpose in Appendix B.

4). The proposal's total assessment score is calculated according to the mathematical formula outlined above. Important deficiencies and merits in the design proposal can then be identified and brought forward for additional consideration during another review procedure. Similarly, they can be utilized to indicate potential trouble areas that should be addressed prior to project approval.

8.2.1.2 Performance dimensions, design elements, and review criteria

The purpose of this section is to define the performance dimensions, design elements, and review criteria that collectively make up the Project Assessment Model. Recall that the PAM has been developed in three parts and consists of seven independent design elements with a total of 45 separate review criteria.

PART I. Character and Spirit:

All of the design elements in Part I are concerned with the integrity and quality of the design proposal. They are intended to reflect the degree to which the design proposal can be interpreted as a workable, interesting, and vibrant design solution on its own terms. For this reason, performance for each of the design elements in Part I should be measured solely with regard to the design proposal in isolation from its surroundings. Part I consists of three design elements: *CS1. Restrictions and Requirements, CS2. Formal Design and Design Elements,* and *CS3. Visual Effects.*

CS1. Restrictions and Requirements

This design element measures the performance of a design proposal in terms of official development control standards. These standards represent the *minimum* design-related requirements that are enforceable by law. This design element consists of seven review criteria that basically control the use and intensity of the proposed development proposal. These review criteria are:

a) *Land-use*: This criterion refers to how well the intended use matches the established zoning requirements. The evaluation is based on compliance with the general intent of pertinent ordinances and established development plans. This compliance is measured from "Not acceptable" to "Acceptable".

b) Site coverage: This criterion relates to the maintenance of stated open space and set-back requirements. These requirements define the maximum potential buildable area on the site for a given land-use category. Scoring is based on the proposal's site design and layout. It is desirable for a proposal to work within these minimum requirements to achieve an appropriate balance between built-up and open spaces. This criterion is measured in a range from "Not acceptable" to "Exceeds minimum requirements" with "Acceptable" as a mid-point.

c) Height: The height of all or part of a development proposal can have significant implications for its design. Evaluation for this criterion is based on the proposal's compliance with building height restrictions for a given area including bonuses or special exemptions. This compliance is measured from "Not acceptable" to "Acceptable".

d) Bulk: This criterion refers to the relative building mass that will be permitted in a given area. It is determined by assessing the compliance of the proposal with established FSR/FAR ratios. This compliance is measured in a range from "Not acceptable" to "Acceptable".

e) *Parking and loading*: This review criterion recognizes the importance of regulations that determine adequate parking, loading, and service space requirements. A proposal that works within these minimum restrictions to develop an articulate and workable site layout is extremely desirable. Scoring operates in a range from "Not acceptable" to "Exceeds minimum requirements" with "Acceptable" as a mid-point.

f) *Environmental/ecological impact*: Many jurisdictions have established regulations that require development proposals to include impact statements reflecting wind, sun access, and/or environmental effects. These regulations have usually been oriented to prevent negative environmental consequences as a result of development. However, proposals that go beyond these minimum standards to ameliorate or reverse existing negative environmental conditions are encouraged. Consequently, this criterion is measured in a range from "Not acceptable" to "Exceeds minimum requirements" with "Acceptable" as a mid-point.

g) *Implementation costs*: The merit of a project is often considered most real in terms of its fiscal and temporal implications. Proposals that are extremely workable from a design perspective but that can be associated with prohibitive *real* costs, do not represent feasible alternatives for further action. This criterion can be measured in a range from "Not feasible" to "Extremely Viable" with "Realistic" as a mid-point.

CS2. Formal Design and Design Elements

This design element measures the performance of a development proposal in terms of its composition, materials, and design technique. These factors largely determine the characteristic feel and identity of the design proposal. It consists of the following review criteria:

a) *Style*: This review criterion refers to the range and type of design elements included

in the development proposal. Evaluation is based on how well the elements have been incorporated to create an overall sense of balance and harmony as opposed to matching a personal preference for a particular style of building. The proposal seems to exert a characteristic "style" when this balance is achieved. Scoring operates from "Unsuccessful" to "Successful" with "Average" as a mid-point.

b) Composition: The composition of a design is sound when the arrangement of line, space, and volume creates a clear sense of proportion. Measurement reflects how well the visual relationship of these characteristics is utilized to create a pleasant and interesting design effect. This criterion can be scored from "Unsuccessful" to "Successful" with "Average" as a mid-point.

c) Articulation: This criterion reflects how well the major components of a proposal have been reinforced in the design. The proposal seems organized and has a unique order when these components are well defined. This type of achievement is measured from "Unsuccessful" to "Successful" with "Average" as a mid-point.

d) Details: Unique architectural and structural elements have a significant impact on the proposal's character and spirit. Measurement is based on how well these details complement the major compositional elements and stylistic decisions made by the designer. The impact of this criterion is scored from "Detracts" to "Enhances" with "Reinforces" as a mid-point.

e) Materials: The use of specific construction and surface materials effects the visual texture of the design proposal. Wood, glass, concrete, and metal all have different effects that contribute to the proposal's visual appeal. This criterion is measured from "Detracts" to "Enhances" with "Complements" as a mid-point.

f) Colour: Colour completes the "mood" of the design proposal. It has very real social

and cultural connotations that can be capitalized on by altering tonal combinations and colour intensities. Scoring for this attribute is from "Detracts" to "Enhances" with "Complements" as a mid-point.

CS3. Visual Effects

This design element focuses on the aesthetic and visual quality of the development proposal. It is intended to capture its essential spirit as a meaningful work of architecture. From this perspective, the intrinsic beauty and intrigue created by the design is the sole basis for evaluation. These qualities have been shown to be highly correlated with the development of environmental preferences. This element consists of four review criteria:

a) *Interest*: A proposal that captures and retains the observer's attention is visually exciting. Measurement is based on how effectively visual excitement and variety contribute to the development project. Scoring is from "Boring" to "Captivating" with "Interesting" as a mid-point.

b) *Delight*: This review criterion is focussed on the aesthetic beauty of the design proposal. Measurement is based on how pleasing or attractive a development proposal is to the eye. This criterion can be scored from "Unpleasant" to "Charming" with "Pleasant" as a mid-point.

c) *Intrigue*: An intriguing design proposal encourages the observer to "enter into" the design and explore those areas that are unfamiliar or unknown. Loosely structured design proposals with well-defined spatial environments tend to have high levels of intrigue. This criterion can be measured from "Repels" to "Invites" with "Neutral effect" as a mid-point.

d) *Magic*: This review criterion reflects the proposal's design inspiration. Measurement is based on how effectively the project activates an essential spiritual or symbolic presence giving it a certain magical quality. This type of presence contributes to the meaningfulness of the proposal. Scoring is from "No

symbolic content" to "Powerful symbolic content" with "Moderate symbolic content" as a mid-point.

II. Contextual Integrity:

The design elements in Part II represent the contextual impact that can be attributed to any development project. Taken together they reflect the degree to which the design proposal responds to the intrinsic place defining characteristics and physical structure of its surroundings. Performance for each of these elements should be measured in terms of the proposal's impact on the contextual identity of the existing urban environment. Part II consists of two design elements: *CI1. Spatial Organization and Coordination* and *CI2. Place, Identity, and Image.*

CI1. Spatial Organization and Coordination

Designs that are sympathetic to locally determined design "rules" fit easily into development sensitive areas. By recognizing this fact, this design element measures project performance in terms of the urban space system and the structure of the existing urban environment. The contribution that is made by the design proposal to the development of a connected and well-ordered spatial environment is the basis for evaluation. This element consists of seven review criteria:

a) Scale: An appropriate scale is determined by the relative massing, volume, and density of adjacent development. Projects that are either "too small" or "too large" destroy the progressive expansion of a connected open space network. Measurement is based on how well the proposal complements the existing scale of development. Scoring is from "Violates" to "Enhances" with "Reinforces" as a mid-point.

b) Continuity: This criterion refers to the characteristic alternation, form, and sequencing of adjacent development. The repetition of major structural elements or architectural features along the street establishes a characteristic rhythm that

reinforces the continuous nature of the urban spatial environment. Measurement is based on how well the project complements the continuity of existing development. This criterion can be scored from "Violates" to "Enhances" with "Reinforces" as a mid-point.

c) *Enclosure*: A clear sense of enclosure contributes to the nature of the contiguous urban space system. Proposals which significantly strengthen this design attribute will typically refine existing set-back patterns and fill in vacant or under-utilized spaces. How effectively this enclosure is created by the design proposal is the basis for evaluation. Measurement is from "Detracts" to "Enhances" with "Reinforces" as a mid-point.

d) *Structure and order*: This review criterion refers to the macro-structural organization of the urban environment. A well-ordered and coordinated spatial environment promotes ease of movement and facilitates directional awareness. The basis for evaluation is focused on the contribution made by the proposal to the legibility of the urban place. Scoring is from "Detracts" to "Enhances" with "Reinforces" as a mid-point.

e) *Generating features*: Important vistas, views, landmarks, and other key physical elements serve as referential markers that contribute to the structure of the urban place. The degree to which they are capitalized upon in the design proposal is the basis of measurement for this review criterion. Evaluation is from "Neglects" to "Enhances" with "Utilizes" as a mid-point.

f) *Internal/external space*: The perception of a workable open space system is largely determined by how well interior and exterior spaces are related to each other. Ease of movement and interest are facilitated by a contiguous spatial environment. Measurement for this criterion is based on how successfully the proposal coordinates and unifies interior and exterior spatial environments. Scoring is from "Ineffective" to "Effective" with "Average" as a mid-point.

g) *Spatial diversity and definition*: This criterion refers to the character of the urban spatial environment. Diversity and interest are created when both well-defined and less definite spaces are provided. It has been demonstrated that this type of variety improves the suitability of the environment for all types of activity. How well the proposal incorporates both informal and formal spaces is the sole basis of measurement. Scoring is from "Ineffective" to "Effective" with "Average" as a mid-point.

CI2. Place, Identity, and Image

This design element evaluates project performance in terms of specific environmental qualities that contribute to a sense of place. The contribution that is made by the design proposal to the development of a vibrant and meaningful urban environment is the sole basis for evaluation. Providing for diversity, variety, and activity is the critical key to success in this area. This element consists of twelve review criteria:

a) *Suitability*: This review criterion refers to the nature of the proposed development with respect to the existing mix and intensity of local activity. Measurement is based on how well the design proposal responds to the existing activity pattern as opposed to compliance with designated land-use categories. Proposals which contribute to the diversity of the physical environment from this perspective are desirable. The scoring for this criterion is from "Unsuccessful" to "Enhances" with "Successful" as a mid-point.

b) *Ritual and motion*: Any urban place is enhanced by the presence of diverse, vibrant, and activated user populations. Measurement for this criterion is based on the proposal's potential to stimulate this type of activity. Scoring is from "Ineffective" to "Effective" with "Average" as a mid-point.

c) *Movable parts*: The atmosphere of any place is often determined by how easily it can be adapted to an individual's needs and requirements. Flexible layouts and

open-ended designs encourage this personalization in the urban environment. How responsive a given proposal is to adaptation and change by its users represents the sole basis of evaluation for this criterion. It can be scored from "Prohibits" to "Promotes" with "Affords" as a mid-point.

d) *Lights, sounds, and smells*: Unique and interesting sensations contribute to the memorability of any place. The aroma of freshly baked bread, the sound of boats in the harbour, and bright city lights are all examples of important design cues from this perspective. Measurement for this criterion is based on how effectively the proposal capitalizes on the unique sensual characteristics of the environment. Scoring is from "Detracts" to "Enhances" with "Complements" as a mid-point.

e) *Earth, water, wind, and vegetation*: Natural elements and textures are important components of the urban landscape. Proposals which introduce landscape elements and incorporate moving water have been shown to mask traffic noise and improve air quality. Measurement for this criterion is based on how effectively the proposed development employs natural elements to complement the man-made environment. Evaluation is from "Unsuccessful" to "Successful" with "Acceptable" as a mid-point.

f) *Night and day*: This criterion refers to the temporal sequence of light and dark created by the passage of each day. Successful urban environments have characteristic identities both during the day and at night. The basis of evaluation for this criterion is how well the proposal utilizes various combinations of uses and design elements to contribute to the city as a 'round the clock place for living. Scoring is from "Unacceptable at certain times" to "Acceptable at all times" with "Generally acceptable" as a mid-point.

g) *Seasons*: Seasonal change is another important design consideration. It represents markedly different environmental conditions that alter the appearance of the

natural landscape and change the visual characteristics of the urban environment. Vivid colours and effective planting schemes preserve the vitality of winter days while cool shade trees represent a retreat from the heat of summer. Proposals that recognize the influence of seasonal change in their architectural program and overall design are to be encouraged. Measurement for this criterion is from "Unacceptable during a specific season" to "Acceptable in all seasons" with "Generally acceptable" as a mid-point.

h) *Innovation and inventiveness*: Excitement in the urban environment is created when new developments reflect the characteristics of an established place in new and unexpected ways. Measurement for this criterion is based on how well the design proposal reassembles and projects important social, cultural, and regional themes with innovation and inventiveness. Scoring for this review criterion is from "Commonplace" to "Ingenious" with "Interesting" as a mid-point.

i) *Imageability*: This review criterion refers to the memorability of the urban environment. Striking contrasts, well-defined structural forms, and important cultural and historical objects are some of the attributes that contribute to the imageability of the urban environment. The basis for measurement is how successfully the design proposal complements its surroundings by respecting key structural elements or introducing new elements with positive psychospatial effects. Scoring is from "Ineffective" to "Effective" with "Average" as a mid-point.

j) *Sensitivity to heritage and/or cultural sites*: Important heritage buildings and cultural sites contribute to the identity of any place. They command a significant amount of respect in terms of their formal design, architectural styles, construction materials, and colour schemes. Evaluation for this criterion is based on how well the design proposal complements existing heritage

elements. Measurement is from "Detracts" to "Enhances" with "Sympathetic" as a mid-point.

k) Typicality: This review criterion refers to the representative nature of a development project in terms of its style, history, or intended uses. Honest proposals appear to be what they are. The basis for measurement is how effectively the identity of the project is represented by the design proposal. Scoring is from "Poor example" to "Good example" with "Representative" as a mid-point.

l) Reversibility: For heritage re-development projects, changes that significantly alter the integrity of the existing structure should be avoided. The basis for evaluation for this criterion rests on how easily the proposed changes can be reverted to their existing conditions. Scoring for this criterion is from "Irreversible" to "Reversible" with "Semi-reversible" as a mid-point.

III. Environmental Liveability

Part III is intended to represent those design parameters that enhance the total affected environment as a healthful place for living. Performance for each of the design elements is based on the implications of the design proposal for the environment's life sustaining capabilities and overall vitality. This type of assessment moves beyond the minimization of impact to emphasize the integral relationship between the natural and urban worlds. Part III consists of two design elements: *EL1. Natural Systems* and *EL2. Human Environment.*

EL1. Natural Systems

This design element measures project performance in terms of the associated implications of development for the natural environment. The liveability of urban environments is largely determined by the benefits that are created by protecting key water sources, respecting local climatic conditions, and through sensitive development that recognizes the critical balance that sustains the local landscape. The degree to which the design proposal complements these existing ecological systems is the basis of evaluation. This element

consists of five review criteria:

a) *Environmental Factors*: This review criterion refers to the effects of the development proposal on the micro-climatic environment. Air quality and temperature, wind speed, and access to sunlight all determine the liveability of the urban place. Intent on the part of the designer to accommodate the effects of these environmental factors through landscape treatment or design sensitivity forms the basis of evaluation for this attribute. The scoring is from "Detracts" to "Enhances" with "Moderates" as a mid-point.

b) *Water*: Lakes, rivers, streams, and ground water are critical to the vitality of the urban place. They ameliorate extreme climatic conditions in addition to representing key sources of drinking water, wildlife habitat, and recreational opportunities. The impacts of a development proposal can alter subsurface water systems and impact upon existing surface drainage areas. Development which capitalizes on the existing hydrological system while contributing to its preservation and enhancement is desirable. Measurement on this basis is from "Detracts" to "Enhances" with "Respects" as a mid-point.

c) *Natural vegetation*: This review criterion refers to the importance of naturally occurring ground cover, vegetation, and open spaces. How well a design proposal incorporates these natural vegetation zones into the design scheme serves as the basis for measurement. Scoring is from "Violates" to "Enhances" with "Incorporates" as a mid-point.

d) *Wildlife and habitat zones*: Open spaces, underutilized and vacant land, adjacent farming areas, and urban parklands all contribute habitat areas for populations of urban birds and other wildlife. Development which protects and enhances these habitat zones is to be encouraged. Measurement is from "Violates" to "Enhances" with "Incorporates" as a mid-point.

e) *Operating ecology*:[8] The integrity of the natural environment depends on a critical

balance between natural systems. Development can have many disruptive effects on the environment at this level. Measurement for this criterion is based on the intrusiveness of the development proposal within the operating ecology as indicated by the substitution of key landscape coverings, diversion of waterways, or other similar measures. The scoring is from "Violates" to "Enhances" with "Reinforces" as a mid-point.

EL2. Human Environment

This design element measures project performance in terms of the wider effects of the design proposal on the existing social environment. This includes perceptions of security and openness in addition to a recognition of the functional sole role played by the built environment. The sole basis for evaluation in these terms is the impact of the design proposal on the urban environment as a stage for human social life. This element consist of four review criteria :

a) *Behaviour settings*: Every development proposal represents a potential setting for human activity. While the physical environment does not define what social behaviour will occur, it plays a significant supporting role by affording different types of interaction and contact. The real impact of a design proposal in these terms is measured by its ability to create multi-functional environments that capitalize on important cultural conventions and social needs. The degree to which the proposal accomplishes these tasks is scored from "Detracts" to "Enhances" with "Complements" as a mid-point.

b) *Safety*: Far from being tame or sterile, liveable environments are secure and safe. The research has demonstrated that feelings of security correlate very highly with environmental preference and desirability. Design proposals that enhance the perception of environmental safety from this perspective are very desirable. Measurement is based on how effectively the proposal strengthens this

environmental quality by encouraging higher user activity levels or by improving the perimeter visibility of streets and plazas, for example. Scoring for this criterion is from "Disquieting" to "Comforting" with "Soothing" as a mid-point.

c) *Accessibility*: This criterion refers to the openness of urban environments. Effective urban design proposals are universally accessible and inviting. This includes reducing barrier restrictions for the physically challenged in addition to removing other types of "invisible" barriers to access. Measurement for this criterion is from "Restricted access" to "Total access" with "Limited access" as a mid-point.

d) *Management and maintenance*: The liveability of urban environments is often dependent on the viability of physical development projects after they are constructed. Management and operations practices have been shown to significantly effect the liveability of certain environments. As opposed to being an overriding assessment of financial feasibility, the basis for measurement on this criterion is to understand the longer term management and operation implications of the design proposal for the liveability of the space. Scoring is from "Unrealistic" to "Extremely viable" with "Realistic" as a mid-point.

8.2.1.3 Complementary analytical procedures

The Project Assessment Model cannot be isolated from the associated analytical procedures that must be undertaken to ensure the validity of the results of the review process. These procedures fall into three basic categories. First, the PAM must be calibrated by the weighting system to reflect local development priorities and urban design objectives. This is not a difficult task where these priorities can be readily identified and the necessary community support for them is apparent. However, the effective calibration of the PAM is

difficult in circumstances where public commitment or interest is not well understood. A number of goal-setting strategies have been developed in both academic and professional planning literature to deal with this type of situation.[9] These techniques often involve some form of goal identification and clarification phase in addition to the assignment of goal priorities. The significant difference is that calibrating the PAM requires assigning importance values to a pre-defined set of criteria that relate to the nature of the urban design review process. The task is not to identify and priorize *new* indicators of design performance, but rather, to relate the model's performance dimensions, design elements, and review criteria back to the level of community interest. Relatively little effort has been directed at this type of priorization procedure. The common response has been to apply openly structured educational goal-setting techniques (e.g. brainstorming or group discussion) that work towards building effective levels of consensus among group members (Smith & Hester, 1981; Sommer, 1983).

Second, the Project Assessment Model must be supported by a thorough investigation of the design proposal itself. A sufficient appreciation of the proposal's merits and weaknesses with respect to the components of the PAM is necessary in order to provide a representative measurement of its design-related impact. Clearly, investigating the range of possible analytical techniques that could be utilized for these purposes is beyond the scope of this chapter. It is possible, however, to comment on the relationship between the components of the Project Assessment Model and this proposal exploration phase. Figure 8.2 shows the seven design elements that make-up the PAM and their respective scales of measurement. Each of these design elements is focussed on a different set of indicators of project suitability. From a practical standpoint, these indicators anticipate the analytical procedures and investigative tools that are useful for evaluating project impacts at all levels. For example, the contribution that is made by the design proposal to the structure and flow of the urban spatial environment is reflected in a single design element – *Spatial Organization and Coordination.* Compatible analytical procedures that indicate relevant measurements of

Figure 8.2 - Design elements as indicators of complementary proposal analysis techniques.

Design Elements	Measurement of Project Suitability	Indicators	Analytical Techniques/Tools
Restrictions and Regulations	• complies with regulatory environment	• FSR/FAR ratios • use restrictions • bulk requirements • EIA guidelines • implementation cost	• architectural program • plan and section drawings • massing model • Environmental Impact Analysis (EIA) • implementation cost audit
Formal Design and Design Elements	• exhibits unified and diverse design style	• colour scheme • detail elements • massing and structure	• plan and section drawings • elevations • perspective drawings • massing model
Visual Effects	• pleasing visual aesthetics and appearance	• appearance • layout • spatial sequencing • interest	• plan and section drawings • elevations • perspective drawings • animated felt-path visualization (internal)
Spatial Organization and Coordination	• contributes to structure and form of urban space network	• spatial environment • view planes • paths, nodes, districts, landmarks, and edges	• macro-structural element mapping (Lynch, 1961) • figure-ground mapping • linkage mapping • view corridor analysis • animated felt-path visualization (urban spaces)
Place, Identity, and Image	• contributes to impression and character of the place	• area characteristics • "atmosphere" • sensations • activity mix	• artist's rendering • photomontage • proposal animation • historical/cultural survey • verbal descriptions
Natural Systems	• enhances natural systems and strengthens vitality	• wildlife and vegetation zones • water courses • climatic conditions • recharge and rehabitation areas	• mapping ecological zones (McHarg, 1969) • G. I. S./L. B. I. S.
Human Environment	• creates supportive and liveable human environment	• behaviour patterns • surveillance opportunites • barriers to access	• activity mapping (Francis, 1984) • space claim maps (Anderson, 1986) • management plan

suitability for this design element focus on the continuity of the spatial environment, important views, landmarks, and macro-structural elements. The significant point is that the absence of workable project evaluation models for design review has made it nearly impossible to develop complementary proposal investigation techniques. The real emphasis has revolved around perspective, section, and plan drawings in most cases. Other techniques such as photomontage or computer animation have been promoted in academic literature but have achieved relatively little success at the practical level.[10] Much work remains to be accomplished this area.

The final type of analysis that improves the utility of the PAM is the consideration and explanation of scoring results. This is especially important in development control situations where the review process must produce some type of formal recommendation with respect

to the project proposal. The total assessment score reflects the review priorities that are established in the calibration phase. Extremely low or extremely high ratings are, therefore, indicative of those projects that have neglected or successfully accounted for these priorities, respectively. Components of the proposal that fall short of expectations in these key areas can be easily identified and recommendations for their subsequent improvement become apparent on this basis.

Similarly, the analysis of assessment scores provides key insights into the relative merits of different development proposals for the same site location. Comparative scoring profiles can be developed that illustrate these differences on an attribute by attribute basis. Modified *semantic differential scaling analysis* (SDS)[11] can also be employed for this type of comparison. These techniques are utilized to evaluate how individuals feel about particular events, places, or activities (termed "elements"). These tests are conducted by having sample respondents describe their personal feelings about an element or group of elements on a series of bi-polar rating scales or "constructs". From a design review perspective, the design proposal represents the common *element* of investigation and the *evaluation constructs* correspond roughly to the scoring scales provided for each review criteria in the PAM. By subjecting the scoring results to a principal components or factorial analysis procedure on this basis, it is possible to explain variation in scoring priorities for a large group of respondents and to account for the magnitude of these differences in terms of the established review criteria.

8.3 Chapter summary

On the basis of findings in the previous sections of the thesis, this chapter has described the development of the Project Assessment Model (PAM). The PAM is a weighted multi-attribute scoring model that consists of three performance dimensions that are made up of a total of seven design elements. These seven design elements, in turn, consist of a total of 45 separate review criteria that can be applied to a development proposal to evaluate its total

design-related impact. The PAM can be calibrated by the weighting system to reflect local priorities in terms of specific site locations or urban design policy.

Thematically, each of the performance dimensions is intended to reflect an environmental quality that is universal to all liveable urban environments. The design elements, in contrast, represent the various evaluative indices of project performance including its compliance with development control regulations, aesthetic and visual impact, contribution to the atmosphere of the urban area, and overall effects on the liveability of the environment. Finally, the individual review criteria have been developed as indicative measures of project performance for each of the various design elements. After calibrating the PAM and developing a sufficient understanding of a proposals merits, it is possible to score a project on each review criteria from a low of zero to a high of one hundred. This evaluation process affords the identification of a proposal's strengths and weaknesses in addition to facilitating project to project comparison with respect to a uniform definition of design-related objectives.

Notes

[1]This section is meant to provide a referential summary of the key arguments made in each of the previous chapters. To the extent that new information is also introduced, it is also intended to point to the critical deficiencies in the accepted methodology of design review. These deficiencies form the basis upon which the Project Assessment Model is developed later in this chapter.

[2]The Project Assessment Model developed in this section represents a conceptual extension of the findings of the previous chapters to the process of design review. It is clearly exploratory in nature and should be interpreted as a framework which can be utilized for the further development of a more workable design review model. The reader is cautioned to consider this point carefully when evaluating the components of the model.

[3]It is interesting to note that the ASLA (1981) *aesthetic impact assessment model for highway projects* mobilizes these three relative levels of impact – internal, relational, and environmental aesthetics – to develop three categories of review criteria that are strikingly similar to the performance dimensions developed for the Project Assessment Model in this thesis. These three categories are "Vividness", "Intactness", and "Unity", respectively.

[4]This sub-section is intended to provide an overview of the components of the PAM in addition to demonstrating the mechanics of the scoring procedure. The author acknowledges the limitations that this approach introduces from the outset. The preliminary scoring procedure has been retained for two reasons. First, it demonstrates the applicability of the individual design attributes to the review process. Second, it presents a methodology by which the PAM can be further refined and tested in real-world design review situations.

[5]Clearly, there are incidental similarities between the PAM and the Aesthetic Impact Model (A. I. M.) developed by Cats-Baril and Gibson (1986, 1987). It is important to note, however, that these similarities can be largely attributed to the fact that each of these assessment models have employed a multi-attribute weighting system. The critical factors that distinguish these two approaches can be explained in three ways. First, Cats-Baril and Gibson relied solely on the practical experience of practitioners in the field to develop their particular assessment criteria. In significant contrast, the assessment model developed in this thesis is derived from a comprehensive review of influential contemporary urban design literature. It is a response to current issues that serves to theoretically validate and support Cats-Baril and Gibson's previous effort. Second, a distinction can be illustrated by making reference to the higher level dimensions of project performance developed in each of the respective models. Cats-Baril and Gibson's A.I.M. rests solely on the evaluation of visual and aesthetic impact that is internal to the project and/or larger-than-project scale. Conversely, the PAM's elements of review are linked to three wider performance dimensions that are indicative of environmental qualities that contribute to the liveability of urban environments. This approach is intended to link planning goals with design objectives in the review process. Finally, the PAM works to incorporate evaluative measures that relate to a proposal's visual impact as well as to its environmental effects and *presence*. In this way, it only emphasizes visual or aesthetic criteria as they relate to the overall qualitative impact of a given proposal. This strengthens the review process by enabling it to account for the seemingly less-tangible impacts that can be attributed to a particular proposal.

[6]The author wishes to acknowledge the comprehensiveness of the A.I.M. as it was presented in Cats-Baril and Gibson (1987). In order to preserve this same level of clarity in the presentation of the PAM, this presentation format has been used as an organizational framework in this chapter. Unfortunately, this approach seems to distort the real similarities that exist between the two models. The reader is cautioned to take the differences mentioned in the previous endnote into consideration if these two models are to be contrasted for any purpose.

[7]Some of the design attributes seem to operate on a bi-polar scale with no mid-point rating such as *Land-use*, for example. Scoring in this respect should work to understand how well the *essence* of the particular design attribute is met in assigning scores for these review criteria. With respect to the example of the Land-use criterion, the scoring scale is intended to reflect *degrees of acceptability* by measuring compliance with stated zoning by-laws in a

range from "Unacceptable" to "Acceptable". This is an important distinction which should be considered when adapting the PAM.

[8]There is a clear distinction between this review criterion and *Ecological/Environmental Impact* in Part I of the PAM. This is easily demonstrated. The measurement of compliance with stated regulations as in the latter case is considered common practice. In contrast, the integrity of the natural operating ecology including interaction between ecosystems that can be attributed to a development project provides another significant level of investigation. The emphasis in this instance is intended to reflect the global impacts of a project for the vitality of the urban environment.

[9]See for example, Bacon (1986), Francis (1984), Smith and Hester (1981), and Sommer, (1983).

[10]This is true at least for municipal and metropolitan governmental review agencies. Barnett (1974, 1982, 1987) and Shirvani (1981, 1985) have reported successful introduction of innovative analytical techniques in cities like New York and San Francisco where urban design planning efforts have been well established for over a decade. This general observation does not hold true for private consultants, however. The author's personal experience has shown that the introduction of computer technologies into the professional planning, design, and engineering studio for purposes other than drafting is gaining momentum (See for example, NCC, 1987). Similarly, a trend towards the reportage of new approaches for project analysis and strategic urban design planning is beginning to develop in academic and professional literature. Hedman and Jaszewski's, *Introduction to Urban Design* (1984), serves as a good overview and introductory reference to this type of proposal analysis.

[11] SDS and repertory grid techniques have been applied in many fields of study. They are, however, very common in geographical and psychological research. The philosophical and methodological bases for these testing procedures are thoroughly described in Preston and Taylor (1981b). Some applications that should be examined prior to undertaking a critical comparison of PAM scores are Potter (1984), Preston and Taylor (1981a), and Smith and Raths (1980).

CHAPTER NINE

SETTING THE STAGE: AN INTEGRATED APPROACH TO URBAN DESIGN REVIEW

"The purpose of architecture is to move us. Architectural emotion exists when the work rings within us in tune with a universe whose laws we obey, recognize and respect."

– Le Corbusier, 1923

"And the wind shifts
and the dust on the doorsill shifts
and even the writing of the rat footprints
tells us nothing, nothing at all
about the greatest city, the greatest nation
where the strong men listened
and the women warbled: Nothing like us ever was."

– Carl Sandburg, 1920

"It is not in the great plans, great schemes, great cathedrals that the change will come but in the hearts of ordinary people finding the cathedrals within themselves."

– Sir Karl Lagerfeld, 1991

Experience with environmental impact assessment programs over the past two decades has proven that strengthening the analysis phase prior to project implementation can reduce, and often completely eliminate, the major intrusions that are often associated with large scale development. Similarly, existing urban design review programs have been successful at protecting and reinforcing the visual cohesiveness of urban environments in many jurisdictions. Still, it is becoming increasingly more important that proposal and project evaluation techniques "...become more tightly focussed on *what really matters* and thereby increase [their] usefulness to the decision-making process" (Robinson, 1985, p. 7, emphasis added). For urban design review, this means stressing the vitality, integrity, and character of liveable

city environments. These adaptations, when combined with the findings of the review process itself, are likely to result in better planned, and therefore, better designed projects that not only benefit society, but their proponents as well.

Evaluating design proposals will always be a subjective enterprise in the very best instance. It involves seeing the development proposal as an integrated complex of design attributes and physical relationships that have wide-ranging implications for the urban environment. As the preceding chapters have demonstrated, there is no definitive level of agreement as to what factors represent effective measures of design performance. It is also unclear how the relative importance of these measures should be represented. Given these realities, it is important to consider what contributions the Project Assessment Model as a weighted multi-attribute scoring mechanism can make to the urban design review process. Furthermore, it is equally important to understand how a review system that is based on the PAM will impact upon the success of urban design planning as a whole. Exploring these two questions is the purpose of this final chapter.

9.1 Opportunities and obstacles

Subjective evaluations, by definition, are inherently imprecise and indefinite regardless of their basis of measurement. In this light, "good" or "bad" design performance as indicated by any set of criteria is equally as valid as the results obtained by utilizing the Project Assessment Model. This reality breaks down, however, where the results of the evaluation process anticipate taking further actions or when the comparison of objects is facilitated by the same set of performance criteria. These two tasks require some means of coordinating the investigation process while ensuring that individual criterion are applied consistently in all situations. It has been shown that developing these characteristics in a workable assessment tool that affords flexibility, creativity, and innovation for urban-scale design represents one of the central challenges facing planning practitioners.

There are four main ways in which the Project Assessment Model can be shown to

respond to this challenge. First, it provides a review mechanism that is reliable and consistent. The detailed specification of review criteria, design elements, and performance dimensions affords the effective comparison of scoring results at the same level of generalization. This improves the meaningfulness of the conclusions reached during design review which, in turn, gives validity to the review process. These real improvements in consistency must not, however, be confused with the false sense of objectivity they seem to create. Even though the PAM produces a specific assessment value for each project, it is important to remember that this score is only relative to the 100 point scoring scale and the corresponding labels that have been attached to it. Similarly, the reliability of the results is dependent upon the rigor with which the specific criteria are applied in addition to the mindset and capabilities of the individuals that are undertaking the review. From this perspective, the PAM is clearly not able to provide a strict measurement of a project's value or *worth.* To the contrary, it is the qualitative improvements in the structure and scope of basic design review inquires that are facilitated most effectively by the Project Assessment Model.

Second, the PAM works to bring key policy objectives and design theory into the review process. The components of the PAM each correspond with important urban design goals and objectives that have been identified in the literature. To extend this line of reasoning, the incorporation of the weighting system encourages the adaptation of these measurements to reflect local priorities and interests.[1] For example, if Part I of the PAM was given a weight of 0.6, Part II was given a weight of 0.2, and Part III was given a weight of 0.2, it would reflect the perception of the evaluating group that *character and spirit* is three times as important as either *contextual integrity* or *environmental liveability* are for a given project. Similarly, *contextual integrity* and *environmental liveability* can be interpreted to have an equivalent importance in the reviewing body's opinion. The important point is that a balance between expert opinion (i.e. which design attributes should be considered) and public input (i.e. the relative importance of each attribute) has been reached by the Project Assessment Model.

Where possible, these importance weightings should be explicitly defined *prior* to the

review process. Achieving this objective contributes to the effectiveness of the PAM in four areas (Cats-Baril & Gibson, 1987, p. 473). First, it establishes from the outset the basis upon which decisions will be made during design review in addition to specifying which attributes will be of greatest importance for a given project. Second, it contributes to the consistent interpretation of review criteria. Finally, a well-defined set of performance weightings can be used to aid designers prior to the review process as an indication of those factors that should be given most consideration while designing. In no uncertain terms, the ease with which this calibration process can be carried out is determined by the precision and specificity of the individual review criteria themselves. It is not surprising, therefore, that this task would prove extremely difficult without extensive revision and adaptation given the present form of the PAM. Still, it is evident that where there is general agreement upon the terms of evaluation that the discussion should move quickly to a consideration of the relative importance of specific planning objectives and design attributes. This type of debate is necessary in any effective planning environment.

The third contribution made by the PAM is that it serves as a lexicon which relates specific environmental attributes to identifiable planning goals. The research has clearly shown that the inability of planners and architects to discuss urban design planning issues is partly due to the absence of this type of design-related vocabulary. It is also compounded by the fact that both architects and planners seem to approach urban design problems from different perspectives. The PAM avoids this problem since its development is predicated upon the common ground between each of these professions (i.e. between planning and design). The effects of this contribution can be felt at two levels. First, the PAM affords the review process with a meaningful language that can be used to explain an individual's position with respect to a particular design attribute or development proposal. This strengthens the communication between all interested parties and reduces the potential for misinterpretation of specific concerns. Second, the specification of design review criteria in combination with the weighting system clarifies the design review process for the non-designer public.[2] It provides

a workable framework within which designers are able to explain and demonstrate the effects of particular design-related decisions in a consistent and comprehensible manner.

Finally, the PAM can be employed as an exploratory planning tool. This is facilitated by the measurement system that has been incorporated into the model itself. By varying importance weightings or isolating individual review criteria, it is possible to uncover the potential effects that can be associated with alternative policy directions and specific design attributes, respectively. While this type of experimentation is essential to the success of effective urban planning at all levels, the research has demonstrated that urban design is highly dependent upon this type of creative analysis. The PAM not only facilitates this type of investigation, but encourages the development of innovative design proposals through this experimentation process.

9.1.1 Potential for further research

Several areas which have the potential to provide further research opportunities can be easily identified. At the outset, the Project Assessment Model itself should be comprehensively evaluated and tested in practical design review situations.[3] This analysis should focus on three key areas. First, the review criteria, design elements, and performance dimensions should be tested for validity and definitional accuracy. This should include an investigation of the compatibility of the review criteria that define each design element in addition to an assessment of the independence of the three key performance dimensions. Second, the scoring procedure and methodological analysis of design proposals needs to be checked for functional inefficiencies. An important consideration in this respect is the length of the review process when utilizing the Project Assessment Model. Finally, the reliability of the weighting system to reflect local priorities in design review should be considered. Effective complementary investigations in this area may involve the identification of specific weighting systems that best highlight differences between competing proposals.

A second area of potential research reflects the application of the PAM in different urban

design review situations. Preliminary indications are that the model itself will function adequately under varied conditions. However, the increasingly large commitment that is being made to community planning efforts in many jurisdictions suggests that this area warrants additional consideration. Perhaps, most valuable in this respect would be the application of the PAM in community meetings or educational settings. Similarly, a broader investigation of the PAM as a design tool is warranted including adaptations to classroom and design studio settings.

Another key research area is reflected in the need for complementary analytical techniques that contribute to the overall design review process. Clearly, the PAM itself is only as valuable as the information that is made available to describe a given project. A concerted investigation of design and design-related analytical techniques with special relevance to urban design planning is needed for this reason. The focus of investigation in this area should be directed at identifying those analytical procedures which most effectively contribute to interpretation of design-related impacts as they can be defined by the various components of the PAM. Formative contributions that have already been made in this area include Anderson (1986b, 1986c), McHarg (1969), Hedman and Jaszewski (1984), Hough (1990), Kemble (1989), and Lynch (1961, 1988).

Finally, future investigations should be directed at the PAM's relative inability to incorporate spatial analyses in a dynamic visual environment. It is certain that the PAM is only effective for developing a static representation (i.e. a *measurement*) of a design proposal's potential impact on the environment. In contrast, Perron (1990) has noted that advances in computer technology have made it possible to manipulate spatial objects at the urban scale in speeds approximating real-time. The potential for incorporating this type of capability into the design review process is largely unexplored. However, using the PAM as a basis of investigation, it is likely that significant advances in the areas of project visualization and evaluation could be made for the purposes of design review and urban design planning.

9.2 Conclusion: Prospects for urban design planning

Urban design sits at the confluence of two complementary notions. The first is represented by the transition between policy and product. The second distinguishes between the practice of *planning* and the necessity of effective *design.* As far as it is possible to see a connection between these two notions, it is also readily apparent that there has been a considerable erosion of the unity which they once shared (Kreditor, 1990; Palermo, 1990). Designers have lost the ability to layout cities at a broad conceptual scale and planners have similarly lost the ability to translate these larger plans into effective design solutions.

This is not a new problem, nor is it something that is unique to urban design planning alone –

> "The innate conflict between the picturesque and the practical cannot be eliminated merely by talking about it; it will always be present as something intrinsic to the very nature of things...it is present in all the arts, even in those apparently the freest, if only as a conflict between their ideal goals and the limiting conditions of the material in which the work of art is supposed to take shape. *A work of art that is not subject to these limitations can, perhaps, be imagined abstractly but never realized materially*" (Sitte, 1885/1986, p. 248, emphasis added).

So it is in planning cities, there is a real need for practical interventions that connect us with the possible and the unimaginable.

Meeting this need has been the intention associated with the development of the Project Assessment Model. It serves as a connective element that works to bridge the gap between theory and practice; between design and planning. As a practical planning tool, it is not so reflective of *how* the built environment affords, but what the affording *means* to those who feel it and how *this* effects their quality of life. It is concerned with translating, interpreting, and synthesizing the effects of adjacent developments into a truly liveable city environment. Where traditional approaches to design review have been limited to an investigation of measurable design attributes, the PAM sets the stage for the incorporation of the less tangible

qualities of the urban environment. Design review conducted on this basis is sure to emphasize the inter-connectedness of new and old urban areas in addition to the critical importance of social and cultural requirements and the vitality of the natural world. This is the only true measurement of urban design planning success – the evolution of a unique and identifiable urban place.

The identity of the city viewed from this perspective does not merely contribute to its aesthetic quality, but rather, it serves as the most powerful attribute of the urban symbol system (Appleyard, 1979). In contributing to the development of this local identity, the process of urban design review, indeed

> "...the public purpose must go beyond removing the barriers to the senses and suppressing disagreeable sensations – that fixation on noxious odors, unpleasant views, or intrusive sounds which is the normal, primitive basis of public regulation. *To bring the world within sensory reach, to increase the depth and fineness of our sensations, and to confer that immediate pleasure and well-being that come from vivid perception are more positive aims – not only to clear the air but to fill it with intricate things to watch, marvelous sounds to hear..Public management [should] put the senses back to work again, so that people take delight in the luminous, odorous, sonorous world all about them*" (Lynch, 1976, p. 15-16, emphasis added).

Taking the broader view, this thesis has demonstrated through the Project Assessment Model that it is possible to connect specific planning objectives based on the diversity and vitality of existing environments with the various techniques and strategies of urban design. By emphasizing these goals, design review contributes to a broader conceptualization of urban planning that is based on a concerted interest in human development as well as the realization of well-designed urban environments. Interpreted in this way, the critical observation is that the specific visual, aesthetic, and physical characteristics of the environment are both complementary to the production of meaningful places for people to live and necessary as parameters of evaluation. The delineation of these characteristics is a necessary

first step in the development of any effective approach to urban design review.

Notes

[1]Still, the PAM itself seems to exert a bias towards the North American cultural environment. Each of the individual review criteria has been constructed on the assumption that the basic municipal infrastructure is in place. In defense of the PAM, the individual measures are intended to reflect dimensions of design-related achievement that would contribute to the liveability of any urban environment. At this level, the PAM is appropriate to cross-cultural design review situations with some minor adaptations. These include revising the definitions of model components to reflect accurately reflect their intent and adding other criteria that are relevant given the conditions of the operating environment.

[2]Some preliminary applications of the PAM by the author suggest that this is perhaps the most significant advantage of this type of evaluation model. Individuals who could not visualize the impacts of particular design-related decisions *spatially* can use the PAM to visualize and interpret impacts *quantitatively*. Much further research has to be conducted in this area to investigate the interchangeability of these two types of visualization.

[3]Investigations in this area have been initiated by the author for a comprehensive storefront improvement and streetscaping program in Brandon, MB. This program has instituted a community-based design review committee that is comprised of business owners, interested citizens, and professional planners and architects. The review mechanism has been implemented through a concerted effort on the part of the local Business Improvement Area. Projects that are dependent upon financial assistance in the form of construction grants or professional design fees are subject to meeting the conditions of the design review process.

Appendices

TABULAR SUMMARY OF THE PROJECT ASSESSMENT MODEL

I. Character and Spirit

CS1. Restrictions and Requirements
a) Land-use
b) Site coverage
c) Height
d) Bulk
e) Parking and loading
f) Environmental/ecological impact
g) Implementation costs

CS2. Formal Design and Design Elements
a) Style
b) Composition
c) Articulation
d) Details
e) Materials
f) Colour

CS3. Visual Effects
a) Interest
b) Delight
c) Intrigue
d) Magic

II. Contextual Integrity

CI1. Spatial Organization and Coordination
a) Scale
b) Continuity
c) Enclosure
d) Structure and order
e) Generating features
f) Internal/external space
g) Spatial diversity and definition

CI2. Place, Identity, and Image
a) Suitability
b) Ritual and motion

c) Movable parts
d) Lights, sounds, and smells
e) Earth, water, wind, and vegetation
f) Night and day
g) Seasons
h) Innovation and inventiveness
i) Imageability
j) Sensitivity to heritage and/or cultural sites
k) Typicality
l) Reversibility

III. Environmental Liveability

EL1. Natural Systems
a) Environmental Factors
b) Water
c) Natural vegetation
d) Wildlife and habitat zones
e) Operating Ecology

EL2. Human Environment
a) Behaviour settings
b) Safety
c) Accessibility
d) Management and maintenance

PROJECT ASSESSMENT MODEL PROCEDURAL SUMMARY AND SCORING SHEETS

Evaluation Procedure for the Project Assessment Model

1). Assign importance weightings that reflect local priorities for design review to each of the model components. Record these weightings on the scoring sheets that have been provided. The sum of the importance weightings for each level of the model should equal one (1). Where a component of the model is not likely to have a significant role in determining the overall impact of a specific proposal set its weighting to zero (0).

2). Review relevant documentation, drawings, and plans that describe the design proposal. Where insufficient information is available or existing information provides an inadequate description of project implications, conduct complementary analyses.

3). Score the proposal on each of the review criteria from "0" to "100". Pay close attention to the specific attribute being measured and the semantic labels attached to the poles and mid-point of the assessment scale. Record scores on the scoring sheets that have been provided.

4). At the completion of the scoring phase, calculate the proposal's total assessment score by multiplying the criteria scores by the appropriate weightings. Add criteria scores to determine design element sub-totals. Transfer these values to the summary table at the bottom of this page. Add design element sub-totals to determine the project's performance rating for each dimension. Sum performance ratings to find the total project assessment score.

Scoring Summary Table

	Design Element Sub-totals			Performance Ratings
Part I Character and Spirit	CS1:	CS2:	CS3:	
Part II Contextual Integrity	CI1:	CI2:		
Part III Enviromental Liveability	EL1:	EL2:		
		Total Assessment Score		

PART I. Character and Spirit

The degree to which the design proposal exists as a unified, workable, and vibrant design solution, in and of itself.

CS1	+	CS2	+	CS3	=	Total	X	Weight	=	Performance Rating
									=	

CS1. Restrictions and Requirements

Performance measured in terms of official development control standards.

Subtotal a) to g)	X	Weight	=	CS1
			=	

a) Land-use: Intended use is compatible with established zoning criteria. *Rating x Weight = Score*

Not acceptable — Acceptable

0 — 50 — 100 _____ _____ = _____

b) Site coverage: Layout meets stated open space and set-back requirements.

Not acceptable — Acceptable — Exceeds minimum standards

0 — 50 — 100 _____ _____ = _____

c) Height: Project falls within established height limits.

Not acceptable — Acceptable

0 — 50 — 100 _____ _____ = _____

d) Bulk: Project meets required FSR/FAR ratios.

Not acceptable — Acceptable

0 — 50 — 100 _____ _____ = _____

e) Parking and loading: Proposal provides adequate parking, loading, and service space.

Not acceptable — Acceptable — Exceeds minimum standards

0 — 50 — 100 _____ _____ = _____

f) Environmental/ecological impact: Proposal meets impact criteria.

Not acceptable — Acceptable — Exceeds minimum standard

0 — 50 — 100 _____ _____ = _____

g) Implementation costs: The project is fiscally, financially, and temporally feasible. *Rating x Weight = Score*

Not feasible	Realistic	Extremely Viable				
0	50	100	_____	_____	=	_____

CS2. Formal Design and Design Elements

Performance measured in terms of design technique.

Subtotal a) to f)	**X**	**Weight**	=	**CS2**
_____		_____	=	_____

a) Style: Proposal incorporates a range of elements that create a sense of balance and harmony. *Rating x Weight = Score*

Unsuccessful	Average	Successful				
0	50	100	_____	_____	=	_____

b) Composition: There is a relative distribution of space and volume creating a sense of proportion.

Unsuccessful	Average	Successful				
0	50	100	_____	_____	=	_____

c) Articulation: Basic design components are well defined creating a sense of organization and order.

Unsuccessful	Average	Successful				
0	50	100	_____	_____	=	_____

d) Details: Unique architectural or structural elements accent the larger design proposal.

Detract	Reinforce	Enhance				
0	50	100	_____	_____	=	_____

e) Materials: The use of materials creates the intended style and texture.

Detracts	Complements	Enhances				
0	50	100	_____	_____	=	_____

f) Colour: The use of colour augments the stylistic achievements of the project.

Detracts	Complements	Enhances				
0	50	100	_____	_____	=	_____

CS3. Visual Effects

Performance measured in terms of the design proposal's overall aesthetic and visual impact.

Subtotal a) to d)	**X**	**Weight**	**=**	**CS3**
_____		_____	=	_____

a) Interest: The proposal captures and retains the observer's attention.

Boring	Interesting	Captivating	*Rating*	*x*	*Weight*	=	*Score*
0	50	100	_____		_____	=	_____

b) Delight: The design itself is visually pleasing and attractive.

Unpleasant	Pleasant	Charming					
0	50	100	_____		_____	=	_____

c) Intrigue: The observer is encouraged to "enter into" the design and explore the not yet known.

Repels	Neutral effect	Invites					
0	50	100	_____		_____	=	_____

d) Magic: The proposal captures an essential spiritual quality or symbolic theme.

No symbolic content	Moderate symbolic content	Powerful symbolic content					
0	50	100	_____		_____	=	_____

PART II. Contextual Integrity

The degree to which the design proposal incorporates the intrinsic qualities of the surrounding environment.

CI1	**+**	**CI2**	**=**	**Total**	**X**	**Weight**	**=**	**Performance Rating**
_____		_____		_____		_____	=	_____

CI1. Spatial Organization and Coordination

Performance measured in terms of the quality and structure of the urban space and space systems affected by the design proposal.

Subtotal a) to g)	**X**	**Weight**	**=**	**CI1**
_____		_____	=	_____

a) Scale: The relative massing, volume, and density of surrounding developments is respected. *Rating x Weight = Score*

Violates	Reinforces	Enhances				
0	50	100	_____	_____	=	_____

b) Continuity: The proposal complements the characteristic form and alternation of adjacent buildings.

Violates	Reinforces	Enhances				
0	50	100	_____	_____	=	_____

c) Enclosure: The proposal shapes and extends the contiguous urban space system.

Detracts	Reinforces	Enhances				
0	50	100	_____	_____	=	_____

d) Structure and order: The overall structure and coordination of the urban environment is enhanced by the design project.

Detracts	Reinforces	Enhances				
0	50	100	_____	_____	=	_____

e) Generating features: Important vistas, views, landmarks, and other key physical elements are capitalized upon in the design proposal.

Neglects	Utilizes	Enhances				
0	50	100	_____	_____	=	_____

f) Internal/external space: The proposal coordinates and unifies interior and exterior spatial environments.

Ineffective	Average	Effective				
0	50	100	_____	_____	=	_____

g) Spatial diversity and definition: Both formal and informal spaces are incorporated in the design.

Ineffective	Average	Effective				
0	50	100	_____	_____	=	_____

CI2. Place, Identity, and Image

Performance measured in terms of environmental qualities that contribute to a specific sense of place.

Subtotal a) to l)	**X**	**Weight**	**=**	**CI2**
_____		_____	=	_____

a) Suitability: The intended use responds to local needs and activity patterns. *Rating* x *Weight* = *Score*

Unsuccessful	Successful	Enhances				
0	50	100	_____	_____	=	_____

b) Ritual and motion: The development proposal actively attract diverse, vibrant, and activated user populations.

Ineffective	Average	Effective				
0	50	100	_____	_____	=	_____

c) Movable parts: Designed spaces permit and encourage personalization of the environment.

Prohibits	Affords	Promotes				
0	50	100	_____	_____	=	_____

d) Lights, sounds, and smells: The proposal strengthens the unique sensual characteristics of the environment.

Detracts	Complements	Enhances				
0	50	100	_____	_____	=	_____

e) Earth, water, wind, and vegetation: Natural elements and textures are introduced by the design.

Successful	Acceptable	Unsuccessful				
0	50	100	_____	_____	=	_____

f) Night and day: The temporal sequence of day and night is respected.

Unacceptable at certain times	Generally acceptable	Acceptable at all times				
0	50	100	_____	_____	=	_____

g) Seasons: Seasonal change is accommodated by the design.

Unacceptable during a specific season	Generally acceptable	Acceptable in all seasons				
0	50	100	_____	_____	=	_____

h) Innovation and inventiveness: The design reassembles and projects important social, cultural, and regional themes in new and unexpected ways.

Commonplace	Competent	Ingenious				
0	50	100	_____	_____	=	_____

i) Imageability: Key elements are developed within their surroundings to strengthen their memorability and psychological impact.

Ineffective	Average	Effective				
0	50	100	_____	_____	=	_____

j) Sensitivity to heritage and/or cultural sites: All design styling, materials, and colour schemes respect architecturally or historically important buildings. *Rating x Weight = Score*

Detracts	Sympathetic	Enhances				
0	50	100	_____	_____	=	_____

k) Typicality: The design proposal is representative of the identity of the project in terms of its style, period of construction, or use.

Poor example	Representative	Good example				
0	50	100	_____	_____	=	_____

l) Reversibility: For heritage projects, the proposal in its entirety can be completely redressed at some point in the future.

Irreversible	Semi-reversible	Reversible				
0	50	100	_____	_____	=	_____

PART III. Environmental Liveability

The degree to which the design proposal enhances the total affected environment as a vital, healthful place for living.

EL1	+	**EL2**	=	**Total**	**X**	**Weight**	=	**Performance Rating**
_____		_____		_____		_____	=	_____

EL1. Natural Systems

Performance measured in terms of the qualitative and quantitative effects on the natural environment.

Subtotal a) to e)	**X**	**Weight**	=	**EL1**
_____		_____	=	_____

a) Environmental Factors: The design proposal complements and capitalizes on micro-climatic conditions. *Rating x Weight = Score*

Detracts	Moderates	Enhances				
0	50	100	_____	_____	=	_____

b) Water: Lakes, rivers, streams, and ground flow water sources are respected.

Detracts	Respects	Enhances				
0	50	100	_____	_____	=	_____

c) Natural vegetation: Existing natural vegetation and planting materials are incorporated. *Rating x Weight = Score*

Violates	Incorporates	Enhances				
0	50	100	_____	_____	=	_____

d) Wildlife and habitat zones: Critical habitat and wildlife areas are protected.

Violates	Incorporates	Enhances				
0	50	100	_____	_____	=	_____

e) Operating Ecology: The integral balance of natural systems is mobilized and accentuated by the design proposal.

Violates	Reinforces	Enhances				
0	50	100	_____	_____	=	_____

EL2. Human Environment

Performance measured in terms of the qualitative and quantitative effects on the social and behavioural environment.

Subtotal a) to d)	**X**	**Weight**	**=**	**EL2**
_____		_____	=	_____

a) Behaviour settings: The design proposal contributes to the development of multi-functional social and cultural environments. *Rating x Weight = Score*

Detracts	Complements	Enhances				
0	50	100	_____	_____	=	_____

b) Safety: The design proposal projects an overall sense of security and safety.

Disquieting	Soothing	Comforting				
0	50	100	_____	_____	=	_____

c) Accessibility: Barrier-free accessibility and openness reinforce the pursuit of universally attainable urban environments.

Restricted Access	Limited Access	Total Access				
0	50	100	_____	_____	=	_____

d) Management and maintenance: Ongoing operation and maintenance requirements are not prohibitive or out of reach.

Unrealistic	Realistic	Extremely viable				
0	50	100	_____	_____	=	_____

Bibliography

Books and Theses

Alexander, C. (1979). The timeless way of building. New York: Oxford University Press.

Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I., & Angel, S. (1977). A pattern language: Towns, building, construction. New York: Oxford University Press.

Anderson, S. (ed.). (1986a). On streets. Cambridge, MA: MIT Press.

Andruss, V., Plant, C., Plant, J., & Wright, E. (eds.). (1990). Home! A bioregional reader. Philadelphia: New Society Publishers.

Attoe, W., & Logan, D. (1989). American urban architecture: Catalysts in the design of cities. London: University of California Press, Ltd.

Bacon, E. (1967). Design of cities. New York: The Viking Press.

Barnett, J. (1974). Urban design as public policy: Practical methods for improving cities. New York: Architectural Record Books.

Barnett, J. (1982). An introduction to urban design. New York: Harper and Row, Publishers.

Barnett, J. (1986). The elusive city: Five centuries of design, ambition, and miscalculation. New York: Harper and Row, Publishers.

Bookchin, M. (1980). Toward an ecological society. Montreal: Black Rose Books Ltd.

Caminos, H., et al. (1980). Urbanization primer. Cambridge, MA: MIT Press.

Collins, G. R., & Collins, C. C. (1986). Camillo Sitte: The birth of modern city planning. New York: Rizzoli International Publications, Inc.

Coyle, T. M. (1980). The application of ecological planning principles to the urban planning and development process. Unpublished major paper, Master of Environmental Studies Program, York University, Ontario.

Cullen, G. (1961). The concise townscape. London: Van Nostrand Reinhold Company.

Diamond, N. J. (1972). Housing in Canada: Problems and possibilities. Toronto: University of Toronto.

Dickerson, S. L., & Robertshaw, J. E. (1975). Planning and design. Lexington, MA: Lexington Books.

Eliade, M. (1959). The sacred and the profane: The nature of religion. Orlando, FL: Harcourt

Brace Jovanovich.

Faludi, A. (1978). Essays on planning theory and education. Oxford: Pergammon Press, Ltd.

Francis, M., Cashdan, L., & Paxson, L. (1981). The making of neighbourhood open spaces. New York: Centre for Human Environments.

Francis, M., Cashdan, L., & Paxson, L. (1984). Community open spaces. Washington, D. C.: Island Press.

Frankl, V. E. (1978). The unheard cry for meaning: Psychotherapy and humanism. New York: Washington Square Books.

Friedmann, J. (1987). Planning in the public domain: From knowledge to action. Princeton, NJ: Princeton University Press.

Fuller, R. B. (1972). Buckminster Fuller Reader. Harmondsworth: Penguin Books Ltd.

Geddes, P. (1968). Cities in evolution: An introduction to the town planning movement and the study of civics (2nd ed.). London: Ernest Benn Limited. (Originally published 1915)

Gehl, J. (1987). Life between buildings: Using public space. (J. Koch, Trans.). New York: Van Nostrand Reinhold Company Inc. (*Livet mellem husene* originally published 1980).

Gold, J. R. (1980). An introduction to behavioural geography (2nd ed.). London: Oxford University Press.

Gosling, D., & Maitland, B. (1984). Concepts of urban design. New York: St. Martin's Press.

Gould, P. R. (1987). Analytical behavioural geography (2nd ed.). London: Croom Helm Ltd.

Habraken, N. J. (1972). An alternative to mass housing. (B. Valkenburg, Trans.). London: The Architectural Press. (Originally published 1961).

Hall, E. T. (1959). The silent language. New York: Anchor Books.

Hall, E. T. (1969). The hidden dimension. New York: Anchor Books.

Hedman, R., & Jaszewski, A. (1984). Fundamentals of urban design. Chicago: APA Planners Press.

Heilbroner, R. L. (1961). The worldly philosophers: The lives and ideas of the great economic thinkers (2nd ed.). Clinton, MA: The Colonial Press.

Hesselgren, S. (1975). Man's perception of man-made environments: An architectural

theory. Stroudsbourg: Dowden, Hutchinson, and Ross.

Hester, R. T. (1984). Planning neighborhood space with people (2nd. ed.). New York: Van Nostrand Reinhold Co. Inc.

Hewitt, J. P. (1984). Self and society: A symbolic interactionist social psychology (3rd ed). Boston, MA: Allyn and Bacon, Inc..

Hillier, B., & Hanson, J. (1984). The social logic of space. Cambridge, England: Cambridge University Press.

Hodge, G. (1986). Planning Canadian communities. Toronto: Methuen Publications.

Hough, M. (1984). City form and natural process. London: Croom Helm Ltd.

Hough, M. (1990). Out of place: Restoring identity to the regional landscape. New Haven: Yale University Press.

Howard, E. (1965). Garden cities of tomorrow. London: Faber and Faber, Ltd. (Originally published 1898).

Jacobs, J. (1961). The death and life of great American cities. New York: Vintage Books.

Jain, R. K., & Hutchings, B. L. (eds.). (1978). Environmental impact analysis: Emerging issues in planning. Chicago: Uniersity of Illinois Press.

Jencks, C. (1986). Modern movements in architecture (2nd ed.). Harmondsworth, England: Penguin Books Ltd.

Kagan, P. (1975). New world utopias: A photographic history of the search for community. New York: Penguin Books Inc.

Kemble, R. (1989). The Canadian city: St. John's to Victoria: A critical commentary. Montreal, PQ: Harvest House Ltd.

Krier, R. (1979). Urban space. (C. Czechwski & G. Black, Trans.). London: Academy editions. (Originally published 1975).

Lanchester, H. V. (1925). The art of town planning. London: Chapman and Hall Ltd.

Lang, J. T. (1987). Creating architectural theory: The role of the behavioural sciences in environmental design. New York: Van Nostrand Reinhold company Inc.

Le Corbusier. (1948). Concerning town planning. London: The Architectural Press. (*Propos d'urbanisme* originally published 1946).

Le Corbusier. (1967). The radiant city. London: Faber & Faber Ltd. (*La ville radieuse*

originally published 1923).

Le Corbusier. (1971). Looking at city planning. (E. Levieux, Trans.). New York: Grossman Publishers. (*Maniere de penser l'urbanisme* originally published 1946).

Liu, D. Y. (1991). A rhapsody of the forks. Unpublished interdisciplinary Ph.D candidacy examination, Faculty of Graduate Studies, University of Manitoba, Winnipeg.

Lynch, K. (1960). The image of the city. Cambridge, MA: MIT Press.

Lynch, K. (1971). Site planning Cambridge, MA: MIT Press.

Lynch, K. (1976). Managing the sense of a region. Cambridge, MA: MIT Press.

Lynch, K. (1984). Good city form. Cambridge, MA: MIT Press.

Lynch, K. (1990). City sense and city design: Writings and projects of Kevin Lynch. (T. Banerjee and M. Southworth, eds.). Cambridge, MA: MIT Press.

Lynch, K., & Hack, G. (1988). Site planning (3rd ed.). Cambridge, MA: MIT Press.

Mandryk, P. (1989). A comparative assessment of the downtown urban design policies and practices of four cities : Vancouver, Calgary, Regina, Minneapolis. Unpublished Master of City Planning Practicum, University of Manitoba, Winnipeg.

Marcus, C. C., & Sarkisian, W. (1986). Housing as if people mattered. Berkeley: U. California Press.

McGahan, P. (1986). Urban sociology in Canada (2nd ed.). Toronto: Butterworth & Co. Ltd.

McHarg, I. (1969). Design with nature. Garden City, NY: The Natural History Press.

McMillan, R. (1979). Environmental design synthesis of architecture and the inherent structure. New York: Random House Publishers.

More, T. (1967). Utopia. Baltimore: Penguin Books Inc. (Originally published 1516).

Mumford, L. (1961). The city in history: Its origins, its transformations, and its prospects. New York: Harcourt Brace Jovanovich Ltd.

Newman, O. (1972). Defensible space: Crime prevention through urban design. New York: Collier Books.

Norberg-Schulz, C. (1965). Intentions in architecture. Cambridge, MA: MIT Press.

Norberg-Schulz, C. (1980). Genius loci: Towards a phenomenology of architecture. New

York: Rizzoli International Publications, Inc. (*Genius Loci – paesaggio, ambiente, architettura* originally published 1979).

Papadakis, A. (ed.). (1984). Leon Krier: Houses, palaces, cities. New York: St. Martin's Press.

Pye, D. (1964). The nature of design. London: Studio Vista Inc.

Rapoport, A. (1977b). Human aspects of urban form. New York: Pergammon Press Ltd.

Rapoport, A. (1982). The meaning of the built environment. Beverly Hills: Sage Publications.

Rittel, H., & Webber, M. M. (1972) . Dilemmas in a general theory of planning (Working Paper no. 194). Berkeley: Institute of Urban and Regional Development, University of California.

Roberts, M. (1974). An introduction to town plannng techniques. London: Hutchinson & Co (Publishers) Ltd.

Rohe, W. H., & Gates, L. B. (1985). Planning with neighbourhoods. Charlotte: University of North Carolina Press.

Rosenau, H. (1959). The ideal city in its architectural evolution. Boston: Boston Book & Art Shop.

Rossi, A. (1982). The architecture of the city. (Grahame Foundation for Advanced Studies in Fine Arts and The Institute for Architecture and Urban Studies, Trans.). Cambridge, MA; MIT Press. (*L'architettura della citta* originally published 1966).

Rowe, P. G. (1987). Design thinking. Cambridge, MA: MIT Press.

Rykwert, J. (1988). The idea of a town: The anthropology of urban form in Rome, Italy and the ancient world. Boston: MIT Press.

Salazar-Rios, C. O. (1986a). Downtown urban design policy: Theory, practice, process. Unpublished Master of City Planning Thesis, University of Manitoba, Winnipeg.

Schön, D. A. (1983). The reflective practitioner: How professionals think in action. New York: Basic Books, Inc.

Shirvani, H. (1981). Urban design review: A guide for planners. Chicago: American Planning Association.

Shirvani, H. (1985). The urban design process. New York: Van Nostrand Reinhold Company Ltd.

Sitte, C. (1986). City planning according to artistic principles: A contribution to the solution of modern problems of architecture and monumental sculpture especially with regard to the city of Vienna. (G. R. Collins & C. C. Collins, Trans.). New York: Rizzoli International Publications, Inc. (*Der Stätbau nach seinen künstlerischen Grundsätzen* originally published 1885).

Sommer, R. (1974). Tight spaces: Hard architecture and how to humanize it. Englewood: Prentice Hall Inc.

Sommer, R. (1983). Social design: Buildings created with people in mind. Englewood: Prentice Hall Inc.

Spirn, A. W. (1984). The granite garden: Urban nature and human design. New York: Basic Books Inc.

Sprieregan, P. D. (1965). Urban design: The architecture of towns and cities. New York: McGraw-Hill Book Co.

Steele, F. (1973). Physical settings and organizational development. Reading, MA: Addison-Wesley, Inc.

Suttles, G. D. (1968). The social order of the slum. Chicago: U. Chicago Press.

Tafuri, M., & Dal Co, F. (1979). Modern architecture. (R. E. Wolf, Trans.) New York: Harry N. Abrams Inc. (*Architettura contemporanea* originally published 1976).

Tindal, C. R., & Tindal, S. N. (1984). Local government in Canada: An introduction. Toronto: McGraw Hill Ryerson, Inc.

Tod, I., & Wheeler, M (1978). Utopia. London: Orbis Publishing, Ltd.

Todd, N. J., & Todd, J. (1984). Bioshelters, ocean arks, city farming: Ecology as the basis of design. San Francisco: Sierra Club Books.

Trancik, R. (1986). Finding lost space: Theories of urban design. New York: Van Nostrand Reinhold Company Inc.

Unwin, R. (1971). Town planning in practice: An introduction to the art of designing cities and suburbs. New York: Benjamin Blom, Inc. (Originally published 1909).

Vitruvius, P. (1960). The ten books on architecture. (M. H. Morgan, Trans.). New York: Dover Publications. (*De architettura* originally published c. 27 B.C.).

Whyte, W. F. (1956). The organisation man. London: Simon and Schuster Ltd.

Whyte, W. H. (1980). The social life of small urban spaces. Washington, D. C.: The Conservation Foundation.

Wright, F. L. (1958). The living city. New York: Horizon Press.

Articles and Excerpts

Ahrentzen, S., & Evans, G. W. (1984). Distraction, privacy and classroom design. Environment and Behaviour, 16(4), 437-454.

Aitken, S. C., & Bjorklund, E. M. (1988). Transactional and transformational theories in behavioural geography. Professional Geographer, 40(1), 54-64.

Anderson, S. (1986b). People in the physical environment. In S. Anderson (ed.), On streets (p. 1-11). Cambridge, MA: MIT Press.

Anderson, S. (1986c). Studies toward an ecological model of the urban environment. In S. Anderson (ed.), On streets (p. 267-308). Cambridge, MA: MIT Press.

Antes, J. R., McBride, R. B., & John, D. (1988). The effect of a new city traffic route on the cognitive maps of its residents. Environment and Behaviour, 20(1), 75-91.

Appleyard, D. (1969). Why buildings are known: A predictive tool for architects and planners. Environment and Behaviour, 1(2), 131-156.

Appleyard, D. (1979). The environment as social symbol: Within a theory of environmental action and perception. Journal of the American Planning Association, April, 143-153.

Appleyard, D., & Lintel, M. (1972). The environmental quality of city streets: The residents' viewpoint. AIP Journal, (March), 84-101.

Bacon, E. N. (1985). Language of cities. Town Planning Review, 56(2), 174-196.

Bacon, V., & Jenks, M. (1986). Briefing – A means to match user interests and design. In M. Jenks, & J. Scott (eds.), Working Paper #13: What is the point of community architecture? (p. 29-38). Oxford: Oxford Polytechnical University.

Barker, E. (1978). The role of the professional in dealing with residents. In L. Axworthy (ed.), The Citizen and Neighbourhood Renewal (p. 201-229). Winnipeg: Institute for Urban Studies.

Barker, E., & O'Brien, N. J. (1974). Resident behaviour and residential block design. In D. Epstein (ed.), Housing Innovation and Neighbourhood Improvement in Winnipeg's Inner City (p. 255-342). Winnipeg: Institute for Urban Studies.

Barnett, J. (1987). In the public interest: Design guidelines. Architectural Record, (July), 114-120.

Becker, F. D., Gield, B., Galyn, K., & Shyer, S. (1983). Office design in a community

college: Effect on work and communication patterns. Environment and Behaviour, 15(6), 699-726.

Berg, P., & Dasmann, R. F. (1990). Reinhabiting California. In C. Plant, V. Andruss, J. Plant, & E. Wright (eds.), Home! A bioregional reader (p. 35-38). Santa Cruz: New Society Publishers.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (eds.). (1956). Taxonomy of educational objectives: The clasification of educational goals –cognitive domain. Toronto: Longmans & Green and Co.

Bolan, R. S. (1983). The promise and perils of a normative theory of planning. In I. Masser (ed.), Evaluating urban planning efforts (p. 3-15). London: Gower Publishing Co. Ltd.

Bosselman, P. (1987). Redesigning residential streets. In A. Vernez-Moudon (ed.), Public streets for public use (p. 321-330). New York: Van Nostrand Reinhold Inc.

Briggs, R. (1973). Urban cognitive distance. In R. M. Downs &. D. Stea (eds.), Image and environment (p. 361-388). London: Arnold Inc.

Brown, B. B., & Werner, C. M. (1985). Social cohesiveness, territoriality, and holiday decorations: The influence of cul-de-sacs. Environment and Behaviour, 17(5), 539-565.

Brown, J., & Burger, C. (1984). Playground design and preschool children's behaviour. Environment and Behaviour, 16(6), 599-626.

Brown, M. A., & Broadway, M. J. (1981). The cognitive maps of adolescents: Confusion about intertown distances. Professional Geographer, 33, 315-325.

Bunting, T. E., & Guelke, L. (1979). Behavioural and perception geography: A critical appraisal. Annals of the American Association of Geographers, 69, 448-462.

Bushell, R. (1987). Housing design and construction in the Northwest Territories. In R. Robson (ed.), Northern Housing: Perspectives on design and construction (p. 15-24). Winnipeg: Institute for Urban Studies.

Campbell, D. E., & Campbell, T. A. (1988). A new look at informal communication. Environment and Behavior, 20(2), 211-226.

Canter, D., & Tagg, S. K. (1975). Distance estimation in cities. Economic Geography, 51, 339-349.

Cats-Baril, W., & Gibson, L. (1986). Evaluating aesthetics: The major issues and a bibliography. Landscape Journal, 5, 93-102.

Cats-Baril, W., & Gibson, L. (1987). Evaluating landscape aesthetics: A multi-attribute utility approach. Landscape and Urban Planning, 14, 463-480.

Churchman, C. W., Ackoff, R. L., & Leonard, E. (1967). Introduction to operations research. New York: John Wiley and Sons, Inc.

CIAM. (1963). CIAM Charter of Athens, 1933. Ekistics, XVI(Oct.), 263-67.

Clark, D., & Couture, G. H. (1990). Laying the ground rules: Accommodating architectural expression within an integrated urban environment. Plan Canada, 30(6), 36-46.

Corbett, J. (1977). Student built housing: A second visit. Journal of Architectural Research, 6(2), 36-40.

Coshall, J. T. (1985). Urban consumers' cognitions of distance. Geografisk Annaler, 67(b), 107-119.

Davidoff, P. (1965). Advocacy and pluralism in planning. Journal of the American Institute of Planners, 31(4), 331-338.

Duffy, J., & Worthington, J. (1977). Organizational design. Journal of Architectural Research, 6(1), 4-9.

Duffy, M., Bailey, S., Beck, B., & Barker, D. G. (1986). Preferences in nursing home design: A comparison of residents, administrators, and designers. Environment and Behaviour, 18(2), 246-257.

Duhl, L. (1989). The mind of the city – The context for urban life. Environments, 19(3), 1-12.

Duncan, J. S. (1987). Review of urban imagery: Cognitive mapping. Urban Geography, 8(3), 264-272.

Eisenman, P. (1982). The houses of memory: The texts of analogue. Introduction to A. Rossi, The architecture of the city (p. 1-23). (Grahame Foundation for Advanced Studies in Fine Arts, and The Institute for Architecture and Urban Studies, Trans.). Cambridge, MA; MIT Press.

Evans, G. W., Smith, C., & Pezdek, C. (1982). Cognitive maps and urban form. American Association of Planners Journal, (Spring), 232-244.

Falanga, M. (1987). Start making sense: Designing with user participation. Design Methods and Theories, 21(4), 732-739.

Ferguson, A. G. (1979). Some aspects of urban spatial cognition in an African community. Transactions of the Institute of British Geographers, New Series 4, 77-93.

Fisher, M. (1988a). Building the new city. Progressive Architecture, 3, 86-93.

Fisher, M. (1988b). The new urban design. Progressive Architecture, 3, 79-85.

Foley, J. E., & Cohen, A. J. (1984). Working mental representations of the environment. Environment and Behaviour, 16(6), 713-729.

Francis, M. (1982). Behavioural approaches and issues in landscape architecture education and practice. Landscape Journal, 1(2), 92-95.

Francis, M. (1987). Some different meanings attached to a city park and community gardens. Landscape Journal, 6(2), 101-112.

Francis, M. (1988). Negotiating between children and adult design values in open space projects. Design Studies, 9(2), 67-75.

Friedmann, J. (1988). Reviewing two centuries. Society, 26(1), 7-15.

Genereux, R. L., Ward, L. M., & Russell, J. A. (1983). The behavioural component in the meaning of places. Journal of Environmental Psychology, 3, 43-55.

Gosselin, Y. (1990). City living, city learning, city building. Plan Canada, 30(6), 50-53.

Hardie, G. J. (1988). Community participation based on three-dimensional simulation models. Design Studies, 9(1), 56-63.

Henderson, J. L. (1964). Ancient myths and modern man. In C. G. Jung (ed.), Man and his symbols (p. 95-157). London: Aldus Books.

Herzog, T., & Smith, G. A. (1988). Danger, mystery, and environmental preference. Environment and Behaviour, 20(3), 320-344.

Hester, R. T. (1985). 12 steps to community development. Landscape Architecture, 75(1), 78-85.

Hester, R. T. (1987). Community design: Making the grassroots whole. Built Environment, 13(1), 45-60.

Hillier, B. (1985). The nature of the artificial: The contingent and the necessary in spatial form in architecture. Geoforum, 16(2), 163-78.

Hillier, B., & Leaman, A. (1976). Architecture as a discipline. Journal of Architectural Research, 5(1), 28-32.

Im, S. B. (1984). Visual preferences in enclosed urban spaces. Environment and Behaviour, 16(2), 235-262.

Jaakson, R. (1986). Recreation and generic urban housing form. Environment and Behaviour, 18(4), 502-532.

Jacobs, A., & Appleyard, D. (1987). Towards an urban design manifesto. American

Planning Association Journal, (Winter), 112-120.

Jones, C. (1987). Technical aid: Signs of life?. Built Environment, 13(1), 38-44.

Jung, C. G. (1964). Approaching the unconscious. In C. G. Jung (ed.), Man and his symbols (p. 1-94). London: Aldus Books.

Kadury, D. (1979). Onwards from urban design. In D. Soen (ed.), New trends in urban planning (p. 159-175). New York: Pergammon Press Ltd.

Kinney, J. M., Paris-Stephens, M. A., & McNeer-Brockman, A. (1987). Personal and environmental correlates of territoriality and use of space: An illustration in congregate housing for older adults. Environment and Behaviour, 19(6), 722-737.

Kirasic, K. C., Allen, G. L., & Seigel, A. W. (1983). Expression of configurational knowledge of large scale environments: Students' performance of cognitive tasks. Environment and Behaviour, 16(6), 687-712.

Klosterman, R. E. (1978). Foundations for normative planning. Journal of the American Institute of Planners, 44(1), 37-46.

Kreditor, A. (1990). The neglect of urban design in the American academic succession. Journal of Planning Education and Research, 9(3), 155-163.

Lang, J. (1988). Understanding normative theories of architecture. Environment and Behaviour, 10(5), 601-632.

Lawrence, R. J. (1982b). A psychological-spatial approach for architectural design and research. Journal of Environmental Psychology, 2, 37-51.

Lawrence, R. J. (1985). User participation in house design. Building Research and Practice, 13(1), 25-30.

Lee, T. R. (1970). Perceived distance as a function of direction in the city. Environment and Behaviour, 1(2), 40-51.

Lee, T. R. (1971). Psychology and architectural determinism. Architect's Journal, 154, 253-61; 475-83; 651-9.

Leesan, P., & Agyeman, J. (1986). A sense of place? A place of our own. Bulletin of Environmental Education, 183(Aug/Sep), 4-15.

Linday, N. (1978). It all comes down to a comfortable place to sit. Landscape Architecture, (November), 492-497.

Lipman, A. (1976). Professional ideology: The architectural notion of 'user requirements'. Journal of Architectural Research, 5(2), 12-27.

Lloyd, R., & Heivly, C. (1987). Systematic distortions in urban cognitive maps. Annals of the American Association of Geographers, 77(2), 191-207.

Lowenthal, D. (1961). Geography, experience and imagination: Towards a geographical epistemology. Annals of the American Association of Geographers, 51(3), 241-260.

Matthews, M. H. (1981). Children's perception of urban distance. Area, 13, 333-344.

Matthews, M. H. (1987). Gender, home range, and environmental cognition. Transactions of the Institute of British Geographers, 12, 43-56.

McCann, D. (1972). Northern housing design and construction. In R. Robson (ed.), Northern Housing: Perspectives on design and construction (p. 32-43). Winnipeg: Institute for Urban Studies.

McDowell, L. N. (1988). Street smarts. Canadian Heritage, 14(1), 20-23; 40.

McKendry-Smith, S. (1989). A concept in search of a defintion. Bio-joule, September, 17-19.

Moeser, S. D. (1988). Cognitive mapping in a complex building. Environment and Behaviour, 20(1), 21-49.

Mueller, W. S. (1981). Translation of user requirements into house designs: A multi-dimensional scaling analysis. Journal of Environmental Psychology, 1, 97-116.

Nasar, J. L. (1981). Visual preferences of elderly public housing residents: Residential street scenes. Journal of Environmental Psychology, 1, 303-313.

Newell, A., Shaw, J. C., & Simon, H. A. (1967). The process of creative thinking. In G. Terrel, H. Gruber & M. Wertheimer (eds.), Contemporary approaches to creative thinking (p. 63-119). New York: Atherton Press.

Owen, J. H. (1987). A successful street design process. In A. Vernez-Moudon (ed.), Public streets for public use (p. 267-275). New York: Van Nostrand Reinhold Company.

Owens, R. (1986). Participation panacea. Architect's Journal, (June), 24-26.

Palermo, F. (1990). Emerging needs from divergent paths of planning and architecture. Plan Canada, 30(6), 47-49.

Palmer-Benson, T. (1987). Wind breakers: Buildings designed with pedestrian comfort in mind. Canadian Geographic, 107(1), 34-41.

Potter, R. B. (1984). The hand analysis of repertory grids: An appropriate method for Third World environmental studies. Area, 16(4), 315-322.

Preston, V., & Taylor., S. M. (1981a). The family life cycle, lesisure activities, and residential area evaluation. Canadian Geographer, 25(1), 46-59.

Preston, V., & Taylor., S. M. (1981b). Personal construct theory and residential choice. Annals of the Association of American Geographers, 71(3), 437-451.

Proshansky, H. (1974). Environmental psychology and the design professions. In J. Lang, et al. (eds.), Designing for human behaviour: Architecture and the behavioural sciences (p. 72-9). Stroudsbourg, Pa.: Dowden, Hutchinson and Ross.

Robinson, R. M. (1985). The federal EIA process: The federal viewpoint. In V. W. Maclaren, The future of environmental impact assessment in Canada: Selected view-points (No. 33). Toronto: Department of Geography, University of Toronto.

Sadalla, E. K., & Staplin, L. J. (1980). The perception of traversed distance. Environment and Behaviour, 12(2), 65-80.

Savasdisara, T. (1988). Resident's satisfaction and neighbourhood characteristics in Japanese urban communities. Landscape and Urban Planning, 15, 210-210.

Shaffer, G. S., & Anderson, L. M. (1983). Perceptions of the security and attractiveness of urban parking lots. Journal of Environmental Psychology, 5, 311-323.

Smardon, R. C. (1988). Perception and aesthetics of the urban environment: A review of the role of vegetation. Landscape and Urban Planning, 15, 63-480.

Smith, G. C. (1988). The spatial shopping behaviour of the urban elderly: A review of the literature. Geoforum, 19(2), 189-200.

Spaxman, R. (1990). Contributing to the quality of the city: We can do a better job together. Plan Canada, 30(6), 10-12.

Spencer, C., & Weetman, M. (1981). The microgenesis of cognitive maps: A longitudinal study of new residents of an urban area. Transactions of the British Institute of Geographers, 6, 375-384.

Spirn, A. W. (1987). Better air quality at street level: Strategies for urban design. In A. Vernez-Moudon (ed.), Public streets for public use (p. 310-320). New York: Van Nostrand Reinhold Company, Inc.

Stea, D. (1965). Space, territory, and human movements. Landscape, 15(1), 13-16.

Steinitz, C. (1990). Toward a sustainable landscape with high visual preference and high ecological integrity: The Loop Road in Acadia National Park, U.S.A. Landscape and Urban Planning, 19, 213-250.

Thiel, P., Harrison, E. D., & Alden, R. S. (1986). The perception of spatial enclosure as a

function of the position of architectural surfaces. Environment and Behaviour, 18(2), 227-245.

Thompson, D. L. (1963). New concept: Subjective distance. Journal of Retailing, 39, 1-6.

Todd, N. J., & Todd, J. (1990). Design should follow, not oppose, the laws of life. In C. Plant, V. Andruss, J. Plant, & E. Wright (eds.), Home! A bioregional reader (p. 61-64). Santa Cruz: New Society Publishers.

Tzamir, T., & Churchman, A. (1984). Knowledge, ethics, and environment: Behavior studies in architectural education. Environment and Behavior, 16(1), 111-126.

Tzamir, Y. (1979). The urban public space network as a planning concept. In D. Soen (ed.), New trends in urban planning (p. 83-86). New York: Pergammon Press Ltd.

von Franz, M.-L. (1964). The process of individuation. In C. G. Jung (ed.), Man and his symbols (p. 157-254). London: Aldus Books.

von Hausen, M. A., & Robinson, J. M. (1991). Integrating urban design and planning policy to conserve the essence of a special place: City of Barrie height review study. Plan Canada, 31(2), 17-22.

Ward, C. (1987). Community architecture: What a time it took for the penny to drop! Built Environment, 13(1), 7-14.

Weber, H. (1986). The evolution of a place to dwell. Design methods and theories, 20(1), 383-388.

Whistler, W. M., & Reed, D. (1980). Townscape as a philosophy of urban design. Council of Planning Librarians Exchange Bibliography #1342, 1-31.

Yamada, H., et al. (1986). Visual vulnerability of streetscapes to elevated structures. Environment and Behaviour, 18(6), 733-754.

Zube, E. H., Vinning, J., Law, C. S., & Bechtel, R. B. (1985). Perceived urban residential quality: A cross-cultural bimodal study. Environment and Behaviour, 17(3), 327-350.

Conference Proceedings

Appel, N. L. (1988). The continuing saga of ideology and urban transformation or a search for the meaning of the city in an emerging 21st century culture. In M. Pihlak (ed.), The city of the 21st century: Conference proceedings for the City of the 21st Century Conference (p. 15-22). Tempe, AZ: Department of Planning, College of Architecture and Environmental Design, Arizona State University.

Colbert, T. M. (1988). The beauty and the beast: The phenomenology, text, and aesthetic of the contemporary city. In M. Pihlak (ed.), The city of the 21st century: Conference proceedings for the City of the 21st Century Conference (p. 23-24). Tempe, AZ: Department of Planning, College of Architecture and Environmental Design, Arizona State University.

Dudnik, E. E., & Schachtel, W. (1974). Assessing and evaluating the desirability and suitability of the natural environment for human activity or development: A methodology and application. In V. Baznajac (ed.), Proceedings of the Fifth Conference of the Environmental Design Research Association [vol. 10] (p. 155-175). Milwaukee, WN: School of Architecture, University of Wisconsin.

Ferri, R. C. (1988). Pedestrian cities: A model for architecture and urbanism in the post-petroleum age. In M. Pihlak (ed.), The city of the 21st century: Conference proceedings for the City of the 21st Century Conference (p. 927-935). Tempe, AZ: Department of Planning, College of Architecture and Environmental Design, Arizona State University.

Fridgen, C. J. (1981). The representative citizen in design programming. In A. Osterberg C. Tiernan, & R. Findlay (eds.), Proceedings of the Twelfth Conference of the Environmental Design Research Association (p. 197-201). Ames, Iowa: Environmental Design Research Association.

Grebner, D., & Bermudez, J. (1988). Gordon Cullen's visual language of the city: A basis for a model of practical experience of the urban environment. In M. Pihlak (ed.), The City of the 21st Century: Conference Proceedings for the City of the 21st Century Conference (p. 41-49). Tempe, Arizona: Department of City Planning, College of Architecture and Environmental Design, Arizona State University.

Lawrence, R. J. (1982a). Designer's dilemma: Participatory design methods. In A. Chen, P. Bart & G. Francescato (eds.), Proccedings of the Thirteenth Annual Conference of the Environmental Design Research Association (p. 261-271). College Park, MD: Environmental Design Research Association.

Lozar, C. C. (1974). Measurement techniques towards a measurement technology. In C. C. Lozar (ed.), Proceedings of the Fifth Conference of the Environmental Design Research Association [vol. 5] (p. 171-191). Milwaukee, WN: School of Architecture, University of Wisconsin.

Perron, R. P. (1990). Computer animation and simulation in the design studio. In W. R. Hampton &. D. K. Huffman (ed.), Representation: Proceedings of the second International Design Communication Conference (p. 14-15). Tucson, Arizona: DesignEd Communication Association and The University of Arizona, College of Architecture Center for Design Communication.

Pihlak, M. (1988). The city of the 21st century. In M. Pihlak (ed.), The city of the 21st century: Conference proceedings for the City of the 21st Century Conference (p. 9-13).

Tempe, AZ: Department of Planning, College of Architecture and Environmental Design, Arizona State University.

Purcell, T., & Heath, T. (1982). The two communities: Is there a common focus for designer-researcher collaboration?. In A. Chen, P. Bart & G. Francescato (eds.), Proccedings of the Thirteenth Annual Conference of the Environmental Design Research Association (p. 3-15). College Park, MD: Environmental Design Research Association.

Rapoport, A. (1977a). The environment as an enculturing medium. In J. Anderson, & S. Weidemann (eds.), Proceedings of the eighth annual conference of the Environmental Design Research Association (p. 54-58). Washington, D. C.: Environmental Design Research Association.

San Martin, I. (1988). Ideology, form, and innovation. In M. Pihlak (ed.), The city of the 21st century: Conference proceedings for the City of the 21st Century Conference (p. 57-59). Tempe, AZ: Department of Planning, College of Architecture and Environmental Design, Arizona State University.

Scott, B. D. (1982). Tradeoffs in grassroots community controlled design. In A. Chen, P. Bart, & G. Francescato (eds.), Proccedings of the Thirteenth Annual Conference of the Environmental Design Research Association (p. 272-278). College Park, MD: Environmental Design Research Association.

Seidel, A. (1981). How designers evaluate information and why researchers may not care. In A. Osterberg, C. Tiernan, & R. Findlay (eds.), Proceedings of the Twelfth Conference of the Environmental Design Research Association (p. 91-98). Ames, Iowa: Environmental Design Research Association.

Smith, F. J. (1981). Participatory goal setting. In A. Osterberg, C. Tiernan, & R. Findlay (eds.), Proceedings of the Twelfth Conference of the Environmental Design Research Association (p. 419-422). Ames, Iowa: Environmental Design Research Association.

Sneddon, J., & Theobald, C (eds.). (1986). Building Communities: The first international conference on community architecture, planning and design. London: Community Architecture Information Services Inc.

Spreckelmeyer, K. F. (1984). Design and familiarity. In D. Campbell, & D. Duek (eds.), Proccedings of the Fifteenth Annual Conference of the Environmental Design Research Association (p. 25-29). Madison, WN: Environmental Design Research Association.

Vint, T. W. (1988). Becoming authentically human in the anonymous city: A possibility for the 21st century. In M. Pihlak (ed.), The city of the 21st century: Conference proceedings for the City of the 21st Century Conference (p. 51-56). Tempe, AZ: Department of Planning, College of Architecture and Environmental Design, Arizona State University.

Technical Reports, Development Plans, and Guidelines

American Institute of Architects [AIA]. (1985). Design for aging: An architect's guide. Washington, D. C.: American Institute of Architects Press.

American Society of Landscape Architects [ASLA]. (1981). Visual impact assessment for highway projects (DOT-FH-11-9694). Washington, D. C.: United States Department of Transportation and the Federal Highway Administration.

Asad, I., Buckley, S., Domanski, A., Epp, E., et al. (1984). Fort Rouge. Winnipeg: Faculty of Architecture, University of Manitoba.

Baird/Sampson Associates. (1982). Greening downtown : An urban design study of the Georgia/Robson corridor. Vancouver: Author.

Barker, E. (1979). Tenant participation in housing design (CMHC Cat. NH15-6). Ottawa: Canada Mortgage and Housing Corporation.

BC Place Citizen's Advisory Committee [BCPCAC]. (1981). Open space guidelines: BC Place. Vancouver: The Council.

Beck, R. J., & Teasdale, P. (1977). User-generated program for lowrise multiple dwelling housing. Montreal: Centre de Rechêrches et d'Innovation Urbanes, Université de Montreal.

Brundtland Commission. (1987). Our Common Future: Report of the world commission on environment and development. Oxford: Oxford University Press.

Canada Mortgage and Housing Corporation [CMHC]. (1974). Housing the handicapped. Ottawa: Canada Mortgage and Housing Corporation.

Chin, G. (1975). Developmental guidelines & design report. Seattle: International Special Review District Board.

City of Calgary. (1983). Downtown handbook of public improvements. Calgary: Planning Department.

City of Minneapolis. (1981). Central riverfront urban design guidelines. Minneapolis: City of Minneapolis Planning Department.

City of Moose Jaw. (1988). Downtown Moose Jaw heritage guidelines. Moose Jaw: Moose Jaw City Council and Downtown Business Improvement District.

City of Ottawa. (1988). Design guidelines for Sparks Street Mall. Ottawa: Department of Planning and Development.

City of Portland. (1985). Central city plan. Portland, OR: Bureau of Planning.

City of Regina. (1982). Urban design issues for consideration and guidelines for development in downtown Regina. Regina: Planning Department.

City of Regina. (1984). Main street design guidelines. Regina: Planning Department.

City of Regina. (1987). Regina development plan. Regina: Planning Department.

City of San Francisco. (1979). Residential design guidelines for new buildings in older neighborhoods. San Francisco: Urban Design Branch, Department of City Planning.

City of Scottsdale. (1986a). Scottsdale general plan. Scottsdale, AZ: City of Scottsdale Planning Commission.

City of Scottsdale. (1986b). Tonto foothills general plan. Scottsdale, AZ: City of Scottsdale Planning Commission.

City of Scottsdale. (1990). Downtown plan. Scottsdale, AZ: City of Scottsdale Planning Commission.

City of Seattle. (1985). Director's rule. Seattle: City of Seattle Planning Commission.

City of Vancouver. (1982). Downtown – Eastside/Oppenheimer design guidelines. Vancouver: Vancouver Planning Department.

City of Vancouver. (1985). Downtown design guidelines. Vancouver: Vancouver Planning Department.

City of Vancouver. (1986). Central area pedestrian weather protection. Vancouver: Vancouver Planning Department.

City of Vancouver. (1988a). Central Broadway C-3A urban design guidelines. Vancouver: Vancouver Planning Department.

City of Vancouver. (1988b). Georgia Street – Second century design guidelines. Vancouver: Vancouver Planning Department.

City of Victoria. (1985). Design guidelines for the Songhees Area of Victoria West District. Victoria, BC: Planning Department.

City of Victoria. (1985). Policy plan for the Songhees Area of Victoria West District. Victoria, BC: Planning Department.

City of Winnipeg. (1980). Plan Winnipeg : Summary and recommendations of the study team. Winnipeg: Department of Environmental Planning.

City of Winnipeg. (1986). Historic Winnipeg Restoration Area design guidelines. Winnipeg: Department of Environmental Planning.

City of Winnipeg. (1989). Plan Winnipeg. Winnipeg: Department of Environmental Planning.

Collyer, A., Gartner, L., Hatton, G., Kolynchuk, V., Craig, D. S., Honigman, A., Kastes, W., Malinowski, D., & Stawowy, E. (1983). North Portage. Winnipeg: Faculty of Architecture, University of Manitoba.

Department of Environmental Planning. (1986). A backgrounder to the proposed downtown Winnipeg zoning by-law. Winnipeg: Author.

Department of Environmental Planning. (1986). A primer to the proposed downtown Winnipeg zoning by-law. Winnipeg: Author.

Department of Housing and Urban Development [H.U.D.]. (1983). Lessons from local experience. Washington, D. C.: Author.

Design Guidelines Study Group. (1974). On building downtown : Design guidelines for the core area: A report to the City of Toronto Planning Board. Toronto: Author.

Hasler, G., Lam, H. T., Ptashnick, R., & McLachlan, T. (1985). Design guidelines for historic residences in Brandon. Winnipeg: Department of Architecture, University of Manitoba and the Manitoba Heritage Foundation.

Hilderman Witty Crosby Hanna & Associates. (1987). Brandon downtown revitalization plan. Brandon: Brandon Downtown Business Improvement Area.

Hough, M., & Barrett, S. (1987). People and city landscapes: A study of people and open space in metropolitan areas of Ontario. Toronto: Conservation Council of Ontario.

Kachur, R., Nasewich, R., et al. (1987). A critical review of the proposed zoning by-law in relation to the planning of downtown Winnipeg. Winnipeg: Department of City Planning, Faculty of Architecture, University of Manitoba.

Maclaren, V. W. (ed.). (1985). The future of environmental impact assessment in Canada: Selected viewpoints (No. 33). Toronto: Department of Geography, University of Toronto.

MacPherson, M., & Lipman, E. (1979). Tenant selection citeria for public housing: A description and analysis. Ottawa: Canada Mortgage and Housing Corporation.

Manitoba Association of Architects (MAA). (1986). Report to the City of Winnipeg on the proposed downtown zoning by-law. Winnipeg: Author.

Minneapolis Metro Centre. (1988). Metro 2000 plan. Minneapolis: City of Minneapolis

Planning Department.

National Capital Commission [NCC]. (1987). The Parliamentary Precinct Area: Urban design guidelines and demonstration plan for long range development. Ottawa: duToit, Hillier, Allsopp Ltd.

Ndubisi, F., et al. (1984). A culturally sensitive approach to planning and design with native Canadians. Ottawa: Canada Mortgage and Housing Corporation.

Planning and Building Department. (1988). Edmonton downtown design improvement manual. Edmonton: Urban Design Unit Central Area Planning Section and the Downtown Business Association.

Rowan Williams Davies & Irwin, Inc. [RWDI]. (1987). Pedestrian level wind study for Portage and Main development (88-116-1). [Submitted to the Bentall Group Ltd., Vancouver, BC]. Winnipeg: Author.

Salazar-Rios, C. (1986b). Urban design policy in Victoria, Vancouver, Edmonton, Regina, and Toronto. Winnipeg: City of Winnipeg, Department of Environmental Planning.

Shaw, I. (1991). Brandon Downtown Business Improvement Area design guidelines manual. Brandon: Brandon Downtown Business Improvement Area.

Smith, G. C., & Raths, P. F. (1980). Images of northern Canadian resource communities and the problem of out-migration (Working Paper No. 7). Birmingham: University of Birmingham.

Social Planning Council. (1979). Housing conditions in Winnipeg (Report #1). Winnipeg: Social Planning Council of Winnipeg.

Witty, D. (1990, October). Healthy communities and urban planning: How do we meld the two?. Paper presented at the Canadian Healthy Communities Project National Conference, Ottawa, ON.

Witty, D., Rapson, D., Shepard, C., Backman, E., Welland, G., Allen, J., Novak, G., Lacey, R., & Cox, M. (1988). Brandon Improvement Area Initiative: Committee proposal. Brandon: Brandon Downtown Business Improvement Area.

Lectures and Interviews

Baines, C. (1990). The wild side of town [lecture]. Winnipeg: University of Manitoba, Faculty of Architecture.

Berndt, B. (1988, February). Personal interview [with the Development Services Zoning Advisor]. Scottsdale, AZ: Community Development Department.

Daly, H. (1989). Sustainable development [lecture]. Winnipeg: Department of Economics, Faculty of Arts, University of Manitoba.

Davidson, G. (1991). Trends in urban planning [lecture]. Winnipeg: Manitoba Association of the Canadian Institute of Planners and the Department of City Planning, Faculty of Architecture, University of Manitoba.

Dickson, I. (1991, 7 August). Personal interview [with the Vice-president, Environmental Affairs, Manitoba Hydro Corporation]. Winnipeg, Manitoba.

Eardley, A. (1990). A designer's point of view [lecture]. Winnipeg: Faculty of Architecture, University of Manitoba.

Hack, G. (1991). Teaching from practice [lecture]. Winnipeg: 1991 Canadian Association of Planning Students Conference, Faculty of Architecture, University of Manitoba.

Schön, D. (1990a). Learning from practice [lecture]. Winnipeg: Faculty of Architecture, University of Manitoba.

Schön, D. (1990b). The reflective practitioner and planning practice [lecture]. Winnipeg: Faculty of Architecture, University of Manitoba.

Weidemann, S. (1989). Social factors in design [lecture]. Winnipeg: Faculty of Architecture, University of Manitoba.

Wichern, P. (1987). Local government in Canada [lecture]. Winnipeg: Department of Political Studies, University of Manitoba.

Witty, D. R. (1991, June 19). Personal interview [with the National Chairperson, Canadian Healthy Cities Project]. Winnipeg, Manitoba.

Statutes and By-laws

City of Winnipeg, 1988, The Downtown Winnipeg Zoning By-law (#4800/88).

The City of Winnipeg Act, S. M. 1989-90, c. 10, **C. C. S. M. 10.**

The Planning Act, R. S. M. 1987, c. P80, **C. C. S. M. P80.**