Current Urban Design Paradigms and their Application: Research Needs

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During the past fifty years many books and research monographs have been published in the domain of urban studies. Much has been written on urban design. An observer would think the two subjects are independent. This paper argues that they should not be and the mechanism for linking the two is through sets of climatically and culturally appropriate generic designs.

The paper begins with a brief overview of what urban design is and the design paradigms that dominate professional practice today. It then goes on to review a handful of generic solutions, with their strengths and limitations, that form the basic vocabulary of urban designers. This overview establishes the basis for a discussion about the information required to enhance the quality of designs. The argument presented recognizes that most designers adapt generic solutions to the situation at hand rather than following an intellectually detailed program-based, problem-solving process. If this is so what is the information needed to enhance the design process? The design fields need to have generic designs at their disposal that deal with culturally-specific ways of life within different geographic settings.

URBAN DESIGN

Many architects, landscape architects and lay people define urban design in terms of their own interest and expertise. A general definition is, however, widely accepted. Urban design involves the creation of a vision for a city or, more likely, a precinct of city or even more likely, a few blocks of city and then the application of techniques – incentives and controls – to achieve that vision (Lang 1994, Llewellyn-Davies 2000, Lang 2005).

The question is: How is the vision created? Whose interests does it serve? If it is to serve the public interest, what is meant by the public interest? What is the knowledge base required to design well? What does 'well' mean? These questions have to be resolved while designing. What then is the nature of this process? It is certainly, self-conscious and goal driven. Although I have consistently argued for a program-based, problem-solving approach to the creation of that vision, architects in general do not work that way and do not want to do so. They use a paradigm based and/or a generic solution based approach to design. The question is: 'What is the quality of these paradigms and generic solutions?'

CURRENT PARADIGMS

Three major paradigms dominated urban design work during much the twentieth century. A fourth emerged at its end. At the beginning of the century it was the Beaux Arts, City Beautiful. It was displaced in architects' minds by a number of competing images of what the future city should be like. These images came out of two major intellectual traditions: the Rationalist and the Empiricist. Almost contemporaneously, the Empiricist Garden City paradigm and the Rationalist Modernist paradigm were developed during the first two decades

of the century. The first is associated with the Anglo-American intellectual tradition with its roots in English Common Law while the latter is associated with Continental Europe and its intellectual roots in the Napoleonic code.

Photograph by Ruth Durack

a. The City Beautiful
Ceausescu's Bucharest (1977-89 but continuing)

Photograph by Jon Lang

b. The Garden City
Shonzhang Lake, Guangdong, P. R. China (2002+)

Courtesy of Kisho Kurokawa and Associates, architects

c. Rationalism today: Zhengdong, Zhengzhou (2004+)

Photograph by Jon Lang

d. Neo-traditional design: Paternoster Square, London

Figure 1: Four standard urban design paradigms

The City Beautiful

The City Beautiful proponents advocated an urban design of axial plans with radiating roads focusing on specific monuments and/or buildings, grand plazas, wide streets with buildings built to their site boundaries lining the streets. It is an urban design and architecture of display based on Baroque concepts but its proponents also sought an efficient and hygienic city. Haussmann's Paris and the earlier Washington were its precedent. The goal of the City Beautiful was to instil a civic pride in a city's citizens' hearts and minds through the grandeur of the built environment. The inspiration came from the Ecole des Beaux Arts in Paris. The paradigm was widely applied to cities around the world by colonial authorities: the French in the Middle East, North Africa and in Indo-China, the Americans in the Philippines, the British less whole-heartedly in a number of colonies and the Japanese in China.

The City Beautiful was the design paradigm used in two major early

twentieth century capital cities: Canberra and shortly thereafter in New Delhi, both designed in the second decade of the century. Many civic centres (for example, San Francisco) were built in the same vein. Albert Speer sought such a design for Hitler's Berlin. Towards the end of the century the paradigm was applied in Bucharest and Pyongyang both under the aegis of dictators setting out to impress. Merging into the twenty-first century the remnants of the generic City Beautiful plan can be seen in the design of Putra Jaya in Malaysia.

Haussmann's Paris remains the inspiration. It was designed in three dimensions with buildings designs being strictly controlled by very specific guidelines. While having a hegemonic position in specifying what a good city should be like at the beginning of the twentieth century, the paradigm was soon challenged by a number of modernist concepts. They can, perhaps uncomfortably, be divided into two contemporary and opposing groups; the Rationalist and the Empiricist.

The Rationalist Paradigms

Generic solutions designed within the rationalist paradigm are based on a set of assumptions about what is good for people and their creators' images of the modern, future world. They are as good as the linkage between assumptions and reality. In general, they were based on an inadequate model of people, their ways of life and aspirations. This shortcoming has been a particular concern at the urban rather than the building design level. Regarded as the progressive utopians, Rationalists tended to base their designs on Calvinist attitudes (Le Corbusier was raised as a Calvinist), an opening up of spaces, buildings as objects in space, and a celebration of technology. They also focused on eliminating what their proponents perceived did not work in the dirty industrial cities of the late nineteenth and early twentieth century; they failed to look at what worked so the desirable was discarded along with the undesirable, the baby got thrown out with the bathwater.

What emerged was an international style that had a clear internal logic based on efficiency of movement and construction and perceptions of what a sensible modern life should be. The generic solution for housing estates, for instance, consisted of slab blocks facing the sun set in open green space. They were built in large numbers around the world. In many Asian countries they are still being built. In contrast, in parts of Europe and the North America such complexes have been demolished and replaced with housing at the same population density but lower in height and meeting the street – the Neo-Traditional model. Certainly in China the Rationalist solution remains the prevailing housing design model.

Many current urban designs for central cities in the modernising world are also imbued with the spirit of international rationalism but with a more flamboyant architecture. Zhengdong is an example. Generally, however, the limitations of universal modernist design ideologies gave way to post-modernism in architecture during the 1970s and 1980s but not in urban design. Along the way a deviant Rational Model was being promoted. It was the megastructure.

The megastructure is a paradigm in which a city, a university consisting of a number of schools, or a number of what would be individual buildings are encased in a massive, often sprawling, single building. It was a concept advocated by a number of avant-garde designers, such as the Archigram group, during the 1960s (Banham

1976). Place Bonaventure in Montreal and a number of universities such as Bielefeld University in Germany (1969-76; Lang 2005: 125-30) are megastructures. Many megastructures were proposed for precincts of cities and even whole cities by Japanese architects, in particular, but also by such luminaries as Buckminster Fuller (Banham 1976). Only one is actually being built, laboriously bit-by-bit. It is Arcosanti, the dream of Paolo Soleri, being constructed under his direction in the Arizona desert (Soleri 1969, Lang 2005: 125-7).

The Empiricist Paradigms

Empiricists rely on precedents in their designs. It is thus a more conservative approach than the Rationalist. Two major twentieth century paradigms and their consequent generic designs resulted from empiricist thinking. They are the Garden City dating back to late nineteenth century and towards the end of the twentieth century the New Urbanism which is essentially a Neo-Traditional approach to urban design based on a different set of precedents to the garden city. The garden city idea was based on the small English country town that appeared to people such as Ebenezer Howard to provide for a rich life. The New Urbanism models, in contrast, are based on a variety of precedents ranging from small towns to the metropolis of the early to mid-twentieth century.

The Garden City although it no longer attracts much academic attention is probably the most widely used paradigm for suburban development around the world. Its impact on the design of new towns and suburban developments was particularly strong in the years after World War Two. These developments include towns built as part of government decentralization policies such as those in Great Britain. What their plans have in common are major centres and sub-centres (see the discussion of the decomposition model below) and easy access to parks. The model is still applied today but on a much vaster scale in places such as Shonzhang Lake in Gugangong, China (2002+).

Neo-Traditional urban design and the **New Urbanism** are closely related. The latter is generally seen as the core empiricist paradigm today. It takes the principles of traditional, even vernacular, designs and adapts them to modern conditions. Two other approaches can, however, be classified under the rubric Neo-traditionalism. The first involves a love affair with specific forms and desires to reproduce them; in the second the canons of historical sacred texts are applied to architectural and urban design.

A well-known mid-twentieth century example of the vernacular urban design within the first approach is New Gournia (1945-8) designed by Hassan Fathy. Located near Luxor in Egypt, it repeated the traditional forms of village and house patterns of Gournia (Fathy 1973). The village, however, represented ways of life that the villagers were trying to avoid so the new development was largely uninhabited. Today, there has been some interest in the second approach. There has been a revival of interest in applying religious canonical treatises to design. This interest has been particularly prevalent in countries such as India, China and Korea as mechanisms for addressing local and cosmic conditions. Planners tend to dismiss the principles of the canons as being mere superstitions.

The New Urbanism is closely associated with the advocacies of Andres Duany and Elizabeth Plater-Zyberk. Seaside, Florida (1970+), the earliest American example, is based on

the traditions of north-west part of the state. Poundbury, drawing on village types of Dorset, is a British example while the Asiad Village (1980-2) and the Income Tax Colony (1997) in Navi Mumbai drawing on patterns of traditional northern Indian cities, are Indian examples of New Urbanist residential developments. Battery Park City in Manhattan, New York (1979-2012) is a high density urban example. Its precedents were the developments of the 1920s and 1930s much loved by New Yorkers. Louvain-la-Neuve in Belgium is a new town that draws on mediaeval antecedents in its planning although its architecture is neo-modernist. Paternoster Square in London is another urban example.

Observations

Our major ways of thinking about urban design are products of the first half of the twentieth century. The reason is simple. The world was turned upside down in Western Europe and North America by technical, political and social innovations in ways that we have not seen since. Many countries today are trying to catch up. Despite all the research on cities that has taken place in the interim, little has penetrated design thinking. The two major paradigms that rival each other for designers' attention today are the Rationalist Modernist and the New Urbanist.

Neither of these two or other competing paradigms represents whimsical thinking. They are carefully thought out approaches based on a set of assumptions about people and about life. Many of the assumptions about the adaptability of people and the rate of change in the world can, however, be challenged. Each current paradigm addresses some problems well, but not others because they fall outside the concerns addressed by the paradigm. Current paradigms tend to neglect the everyday activities of people (and of other species) that provide the spice of life.

GENERIC SOLUTIONS

A generic solution is a standard way of dealing with a class of problems. The argument is that many situations facing a designer address the same problem so why reinvent the wheel? The Rationalist generic solution for the design of housing estates has already been introduced. Here are some other major generic design solutions that are applied to urban design today.

The urban decomposition model

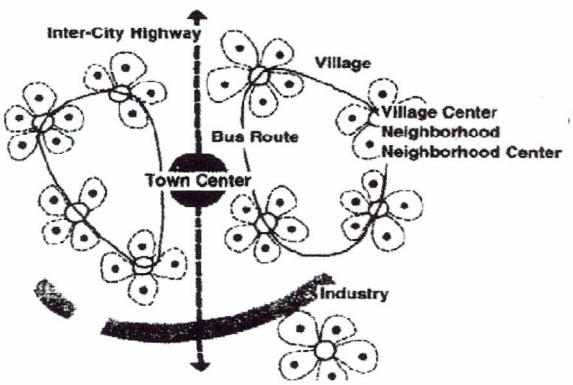
As noted above, in many, if not most, new towns designed during the second half of the twentieth and early twenty-first centuries around the world, the overall concept was to have a major centre at the town's core and the areas around it divided into districts which were then divided into neighbourhoods. Each level in the hierarchy would have a set of facilities serving the area around it.

This was the model for the design of the first and third generation of the government sponsored British new towns, the Soviet new towns and privately developed towns such as Columbia in the United States. In the second generation of the British new towns the model was abandoned because it did not seem to match people's behaviour patterns. It was rehabilitated for the third generation because people in new towns such as Cumbernauld had a predisposition for neighbouring behaviour. In other places the hierarchy was only of two levels; the city and the district which research showed makes more sense in terms of the way people lived their lives. It is more a model for a multi-nuclear city. The neighbourhood unit has been the generic model for the lowest level in the hierarchy.

The neighbourhood unit

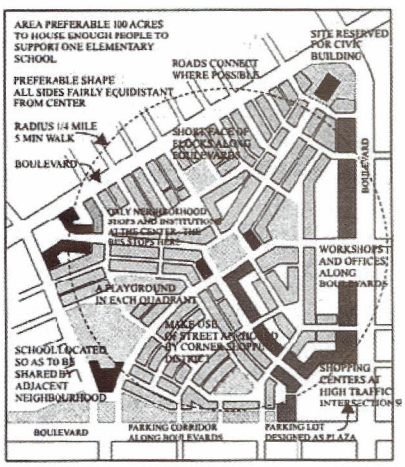
The neighbourhood unit was first proposed by Clarence Perry, a sociologist, as the generic solution for organizing new suburban residential developments. It formed part of the *Regional Survey of New York* of the late 1920s (Perry 1929). The unit consists of a primary school and other local facilities at its core and residential units distributed around it within walking distance. The application of the model took two forms the Rationalist and the Empiricist. In the first, the generic model of housing estates consisted of slab residential buildings laid out in a rectilinear Euclidean geometry. In the Empiricists schemes the roads were curved and the houses were primarily single family detached ones. Recently this basic model was updated by the Duany-Plater Zyberk Partneship so that the facilities are not located at the core but along a street leading into the centre. This change resulted from the recognition that streets can be seams for life and not dividers.

Source: Hester 1975



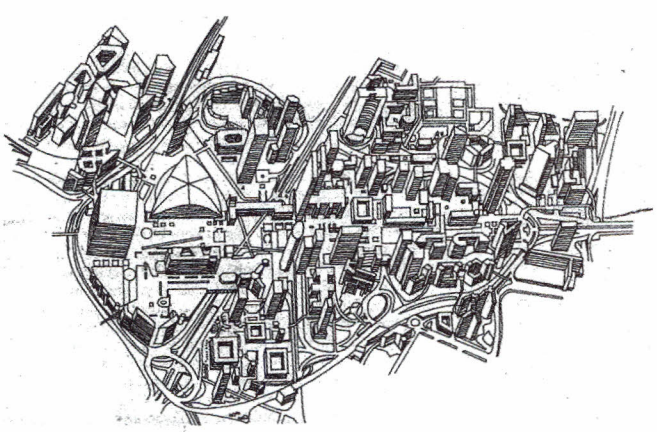
a. The urban composition model

Drawing adapted from various sources by Omar Sharif



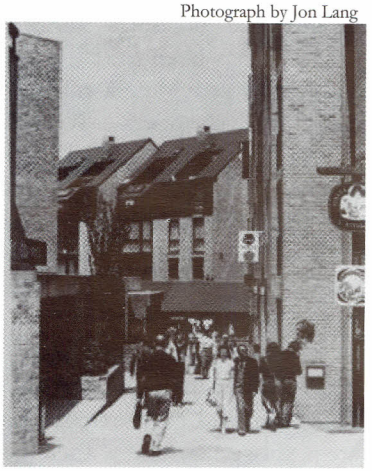
b. The neighbourhood unit proposed by Duany-Plater Zyberk

Drawing by Thanong Poonteerakul; Source Lang 2005: 219



c. The superblock: La Défense, France

Photograph by Jon Lang



d. The pedestrian mall: Louvain-la-Neuve, Belgium

Figure 2: Four generic solutions

The superblock and pedestrian malls/streets

A superblock is one in which the vehicular traffic is kept on the peripheral roads with automobile parking (either in surface lots or structures) feeding off them on the interior edge of the block. The remainder of the interior is reserved for pedestrians. The best known model of such designs, although never implemented, is that proposed by Victor Gruen for Fort Worth, Texas (Gruen 1964). The model has been applied to many residential developments in conjunction with the neighbourhood unit, university campuses and to the hearts of many European cities. La Défense on the outskirts of Paris is probably the largest example. The goal has been to provide pedestrians with a safe and more pleasant environment for getting from one point to another and, more generally, for strolling. Automobile owners, however, want to be able to drive directly from point of origin to their destinations.

The pedestrian mall is a variant of the superblock. In it a ribbon shopping street of a city is closed to vehicular traffic (except at certain hours for serving the buildings along it). The objective has been to enhance business along it by providing a car-free walking area for shoppers. It has failed miserably as a model when the businesses were not doing well before the change was made. Indeed almost half of the pedestrian malls in the United States have been returned to vehicular traffic.

The pedestrian malls that have been successful and even extended in length are those where there was a preponderance of pedestrians anyway. This preponderance occurs in university towns such as Louvain-la-Neuve and vacation resorts where there are many people without cars at their disposal. In the United States, Boulder Colorado is an example of the first and Miami, Florida of the second. Those malls that are dumbbell designs have been the most successful.

A variant of the pedestrian mall is the *woonerf* or shared territory – which is used by drivers and pedestrians alike. Drivers using them expect to see children playing in them and drive accordingly. A major street following much the same principle was opened in London during 2012. It is Exhibition Road in the museum district of South Kensington. Pedestrians have yet to become accustomed to it!

The dumbbell design

A dumbbell is piece of equipment used in weight-training. It consists of a bar with weights at each end. Dumbbell building and urban designs are those in which there is an attraction at each end of a passage way. It is the basic model for shopping centres with their major shops at each end and a string of smaller shops lining a spacious link between them. Pedestrian malls that have elements at each end that generate pedestrian traffic are likely to be successful in terms of both enhancing business activity along them and providing a pleasant environment for pedestrians.

THE ISSUES

How good are these paradigms and generic solutions? Almost all were developed in Western Europe or Eastern United States to deal with designing for human habitats in cool temperate climates and assuming specific cultural norms. These designs have been applied willy-nilly around the world. Sometimes they have indeed worked well but at other times not. Much depended on the similarity of the

context in which they were applied to that in which they were developed.

Why has this situation arisen? The homogenising of architectural education around the world based largely on Western European norms has resulted in standard paradigms being regarded as good ways of thinking about what the future built environment should be like everywhere. This trend is aided and abetted by much significant urban design work being carried out by a limited number of multi-national professional firms on behalf of investment companies that work internationally and municipal authorities seeking a place in the modern world (Olds 2001). Public officials in cities around the world travel and are impressed by what they see and want to have similar places at home. This observation seems particularly to hold in those countries going through a rapid transformation. Public officials and well-to-do citizens take great pride in the scale and, often, the flamboyance of the new urban design projects and architecture of their cities. A number of politicians are, nevertheless, seriously questioning whether the environments achieved are what they really want (Wang 2004).

Many studies show the discrepancy between the design goal of creating well-loved, well used places and what has been achieved. Many research studies on climate and design, culture and design and on transportation and land use have been conducted and published. Many analyses and critiques of building designs have been carried out. They show what works and what does not work. Universities have whole departments of urban studies with academics generating reports on a variety of urban phenomena but little has been applied. Despite all this research and criticism architects tend to continue working within particular design paradigms basing their work on generic solutions. Criticism is often worn as a badge of pride! Knowledge is seen as interfering with the creative act. How can we reduce the applicability gap between research and practice? An alternative design paradigm has been presented but most architects still do not want to work that way. In addition, the process raises concerns that fall outside the short-term interest of property developers. Cities such as Curitiba in Brazil have, nevertheless, closely followed the model proposed here (Lubow 2007).

AN ALTERNATIVE DESIGN PARADIGM

What appears to be emerging on the international scene is a neo-functional, ecological urban design paradigm. It is a procedural rather than an iconic model. The term neo-functional is used to differentiate its concept of functionalism from the much more limited functional aims of the Modernists. Within this approach a functional city is regarded as one that satisfies well-enough the full range of needs and aspirations of its stakeholders. It is also robust enough to undergo change as conditions change without having to be completely demolished and rebuilt. An ecological approach is one that deals both with the everyday lives of people and the workings of the biological environment (Lang 1994, 2000, 2010).

This approach to design involves the setting of goals (always a political act), the translation of these goals into specific design objectives for activities and aesthetic ends, the exploration/invention of patterns of built form that meet these ends based on evidence, the prediction of how these patterns will function in different possible futures and the selection of the way forward. During the process legal and financial issues have to be

resolved. The whole design process is one of conjecturing and testing. It is an argumentative process. Designers argue with themselves, with their colleagues with clients (sponsors and users) on both ends and means. Clarity in arguing requires good evidence. Good evidence comes from knowledge of the affordances of patterns of the built environment. This knowledge comes from the study of cases and from research-based theoretical knowledge. Designers will have to deduce from this knowledge foundation what they should do given an ideological/political position. Designing after all involves a value laden act of will. As it deals with the future and with imperfect knowledge, designers have to stick their necks out. The process involves both the divergent production of ideas and the synthesis of them into wholes and the ability to rationally evaluate the results. It is no easy task. Empirical evidence is what is needed to support it.

Can such an approach to designing be implemented with a high level of intellectual rigour? There is a growing body of knowledge that makes the approach feasible. If one assumes that such a paradigm will develop to a hegemonic place in urban design work then the research effort needs to concentrate on building the neo-functional theoretical basis for design.

Building a Functional Theory for Design

Functional theory deals with how patterns of built form work or do not work for whom in what context. An attempt has been made to outline such a theory using Abraham Maslow's model of human motivations as an armature (Lang 2010). Maslow suggested that there is a hierarchy of human motivations from the most pressing need for survival, to the need for shelter and salubrious environments to the need for physical and psychological security to the need for belonging through the achievement of an identity within a community to the need for self-esteem and self-actualization.

Much empirical knowledge already exists to flesh out this model but much remains to be either corroborated or developed. The basic research task is to come to an understanding of how patterns of built form afford and inhibit the full range of human activities and symbolic ends. Places also have to be comfortable. The temperature, movement and moisture of the air and the olfactory and tactile experiencing of the physical public realm need to be better understood. We need to understand much better the flushing effect of breezes, the levels of sun and shade that provide comfort, and how comfortable levels of humidity can be obtained through the use of vegetation and, in arid areas, the use of water.

The research needs to develop an understanding beyond that of our own experiences, important though they may be, between the patterns of built form and the needs of children and their elders, tourists and habitués, men and women, the middle class and the poor, the able-bodied and the fragile within specific cultural, geographic and climatic contexts. The list of people of concern in any context is long.
A healthy city is one that not only provides a salubrious environment for its inhabitants but also functions in a self-renewing manner (Hough 1989, Barton 2000, Yeang 2006). A sustainable city is one that provides a healthy environment for the lives of humans and other desired species and that itself possesses healthy natural processes. It is one that survives well under change. It sustains the bio-diversity of local eco-systems. It is clear

that designing a fully sustainable city is beyond our present intellectual and political capabilities. To do so will require a considerable shift in attitudes. One of the research tasks is not only to understand the technical issues involved but also the political ones.

Even if we have a fully developed knowledge base few politicians, public officials and urban designers are willing to employ such a demanding procedural model. With some exceptions they wish to copy what they see on their travels or in magazines.

THE POSSIBILITIES

Scholars and professionals have explored two alternatives to having an abstract theory of functions that designers can use as a basis for programming and designing. One is that offered by Christopher Alexander and his colleagues in their pattern language (Alexander et. al. 1977). The second, and the one that I believe has a higher practical utility in everyday design practice, is to have a new set of generic solutions. The objectives and evidence on which the solutions are based must be clear. The second, in many ways, simply extends the first by dealing with bundles of variables simultaneously. In either case the studies need to be carried out region by region.

The pattern language

All architects have a set of patterns in their heads that they use when designing. It is their style. The patterns implicitly follow those in the language developed by Christopher Alexander and his colleagues. The language consists of a series of statements in the following format: to achieve this objective (or solve this problem), use this pattern because this evidence supports the link between objective and pattern. The statements range from design questions at the city level down to details of the environment. The evidence in the work of Alexander and his colleagues is based on research drawn from a number of academic disciplines not guesswork. What their work demonstrates is that there is considerably more rigorously developed research information available to them than most designers are wont to believe. Moreover, the link between objective and pattern is explicitly stated and the argument is transparent. It is up to a designer using the language to examine each statement to determine its utility and to synthesize solutions based on the patterns offered.

Implicit in the language is a specific cultural and geographical context in which the link between problem being addressed and pattern of built form holds. The language as developed by Alexander and his colleagues does bring designers attention to the issues of concern in any situation.

One possible contribution of academic research is to enrich the language by taking cultural and climatic contexts into greater consideration in order to enhance the applicability of the knowledge base of designers. The difficulty is, firstly, that using the language requires considerable time consuming effort and, secondly, that designers want to have their own unique language that gives them an identity. They find it easier to use bundles of patterns implicit already synthesized into generic solutions. They can then individualize the generic solutions to give their designers a sense of being original.

New generic solutions for design

Designers are always working under considerable time and financial pressures and will continue to generate

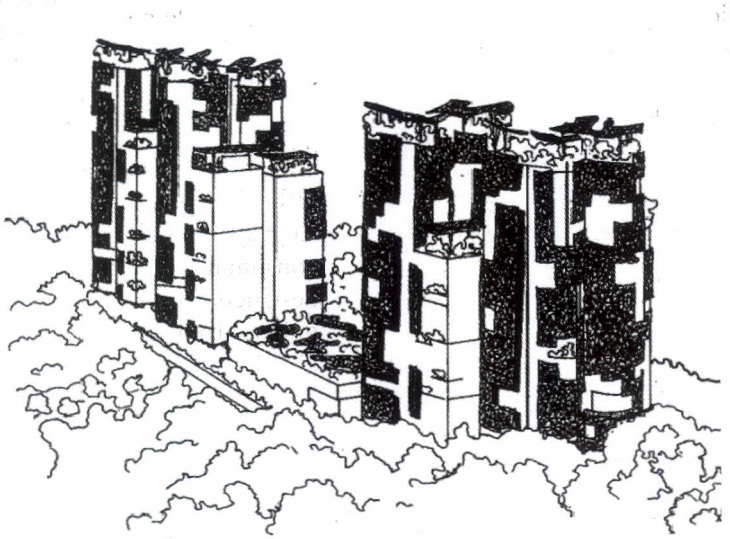
designs based on adapting a handful of particular design paradigm to the situation at hand. The paradigm that is used is generally that in vogue at the time. The problem is that designers often mimic what is bold rather than what works. Indeed the observation that Jane Jacobs made over fifty years ago is still valid:

> The pseudoscience of planning is almost neurotic in its determination to imitate empiric failure and ignore empiric success (Jacobs 1961).

We need to know how our generic solutions work in addressing design concerns in different contexts.

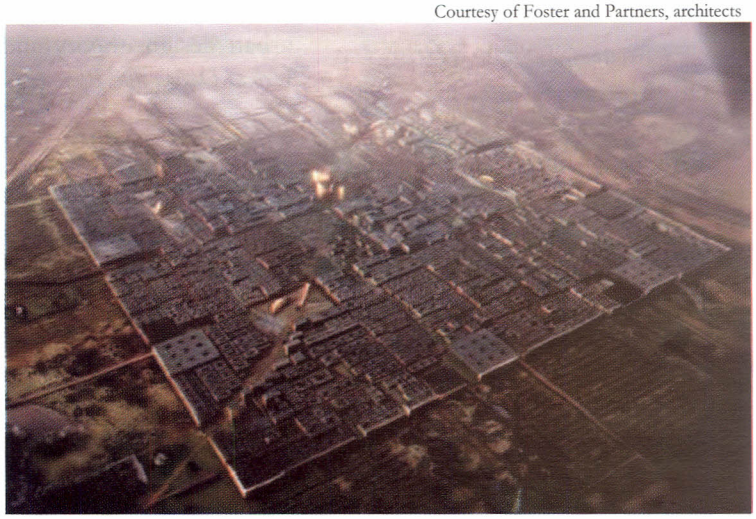
What are needed now are new generic solutions that bring to planners and urban designers' attention the issues of concern and how to address them. Some explorations already exist but they tend to be uni-dimensional – they address only a few design concerns. generic solutions developed within a For instance they may provide patterns for designing within specific climatic zones. What are needed are generic solutions that deal with culture, climate and design goals simultaneously. An example is Ken Yeang's high density housing for tropical environments. Another is the Masdar City (2006) design produced by Foster and Partners. It might be regarded as a prototype for arid environment Islamic cities based on solar energy and other renewal energy sources with a sustainable, zero-carbon, zero waste ecology. A very similar model is that proposed by Rem Koolhaas and his colleagues. The two schemes are similar because they draw on the same evidence. The evidence is much clearer for technical concerns than it is for human concerns. The model of culture on which current explorations are based is unclear.

Drawing by Omar Sharif



a. A generic tropical high rise city by Ken Yeang (2001)

Courtesy of Foster and Partners, architects



b. A generic design for an arid zone Islamic city

Figure 3: Are these two schemes generic designs for the future?

Much the same observation can be made about recent attempts to develop generic solutions to residential area design. The updating of the neighbourhood unit has already been mentioned. There have also been a number of efforts to produce conceptual designs for compact cities with a heavy emphasis on energy savings. If implemented they would require considerable changes in the way we carry out our lives.

It must be remembered that design problems are 'wicked' in nature. Only some variables are understood with any clarity. In addition, there is no stopping rule for saying when the exploration of potential solutions should cease. We generally work until we have a satisficing solution – one that is regarded as good enough. Usually, the time and budget available truncate the search for the best solution. Having good generic solutions to clearly understood problems at their disposal would immensely assist designers in their work.

CONCLUSION

Colin Rowe brought the debate between designing by adapting generic ideas within a specific design paradigm and working using a strong program-based, problem solving process to the attention of those teaching architecture (Rowe 1983). He argued that designers should interweave both approaches. The paradigms that he was considering when he was writing were largely those of the Modernists; Neo-Traditional design although practised, had yet to be recognized as a school of thought by the intelligentsia.

If Rowe is correct, and I believe he is, we need a wider array of generic solutions and diligent case studies that are climate and culture specific. They need to deal not only with who we are but who we might be based on evidence not just hopes. The question is: Who builds these generic solutions? Surely it involves the collaboration of researchers and designers in both the academic and professional worlds.

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