Chapter 2

A framework for settlement-making

2

TABLE OF CONTENTS

INTRODUCTION

The purpose of this chapter is to provide a guiding framework for settlement-making. The chapter provides a brief overview of planning and design in South Africa, which expresses the need for a new framework, before setting out the two central concerns - namely human and nature-centred development - which form the basis of the framework. The starting points to achieve positively performing settlements are provided before performance qualities, clarifying the desired achievements in settlement formation (guided by developments in the planning policy arena) are identified. These are applicable to all the subsequent planning and engineering chapters. Finally, the importance of structure in the planning of human settlements is described.

BACKGROUND

For some fifty years, the planning and design of settlements in South Africa has been dominated by the political ideology of separate development and the planning ideology of modernism.

A central theme of the modernist movement is its basis in functionalist thought, which is dominated by concerns with efficiency and technology. Efficiency is largely defined in technological terms, with urban settlements seen as "machines". Urban life is compartmentalised into broad categories of activity (live, work, play, move), resulting in spatial separation of these activities.

These ideologies have lead to the development of mono-functional settlements, often fragmented and environmentally sterile. These settlements - particularly those created for the disadvantaged members of our society - are characterised by low levels of service and high levels of inconvenience; they generate enormous amounts of movement at great cost in terms of money, time, energy and pollution; they are expensive for inhabitants, and the quality of their public environments is appalling. There is little evidence of a cohesive spatial environment which integrates urban activities and structures.

With the advent of the "new South Africa", it is necessary to reverse the effects of these ideologies. The challenge is to create a framework for settlement-making which will enrich life in settlements and serve as an instrument of urban reconstruction and development. This has already been accepted in policy terms. The government's Urban Development Framework (South Africa 1997) calls for "the physical, social and economic integration of our towns and cities" and stresses the need for higher density, more compact and, in terms of land use, more mixed-use settlements. Similarly, the Development Facilitation Act, No 67 of 1995 (South Africa 1995), inter alia, calls for environments which

- promote the integration of the social, economic, institutional and physical aspects of land development;
- promote integrated land development in rural and urban areas in support of each other;
- promote the availability of residential and employment opportunities in close proximity to or integrated with each other;
- optimise the use of existing resources, including resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- promote a diverse combination of land uses, also at the level of individual erven or sub-divisions of land;
- discourage the phenomenon of "urban sprawl" and contribute to the development of more compact towns and cities;
- contribute to the correction of historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure; and
- encourage environmentally sustainable land development practices and processes.

This framework should begin to move us in this direction. It is based on the integration of the human and nature-centred approaches to settlement-making.

CENTRAL CONCERNS

The human-centred approach emphasises that a central purpose of planning is to ensure that the developmental needs and activities of people living in settlements are catered for and, in particular, that opportunities for people to achieve their full potential through their own efforts are maximised. This approach, rather than being purely cost - or technologically-driven, is people-driven and democratic.

The nature-centred approach recognises that natural systems interact in highly synergistic ways, which must be respected if breakdowns in them are to be prevented. Human actions on the landscape, such as settlement-making, must thus be sensitive to ecological processes. Therefore, rather than imposing settlement development on the environment, this approach emphasises design with nature, thereby creating synergy between man-made and ecological systems.

THE STARTING POINTS

There are three starting points for achieving positively performing settlements.

- The first is the importance of pedestrian movement. A fundamental dimension of scale is related to movement on foot. The pedestrian condition describes the reality for the majority of residents in towns and cities in the country. Large numbers of people do not, and will not in the foreseeable future, own private motor vehicles. Obviously, though, settlements cannot be only pedestrian-based.

  Settlement growth brings with it higher order opportunities, services and movement systems. Consistent with the principle of equity, particularly in communities with low levels of car ownership, public transport becomes a necessity once the pedestrian scale is exceeded.

- The second starting point is the importance of thinking spatially. In pedestrian-scaled environments the public spatial environment should be viewed as the highest level of social infrastructure. In these environments a great deal of activity occurs in the public spaces, with the result that the quality of the public-spatial environment profoundly affects the quality of life. Thinking spatially, in this context, requires that all public spaces, particularly streets, be viewed as public space.

- The third starting point is the importance of a *minimalist approach* to settlement-making. This requires that the basic structure and most important actions required to create the preconditions for a positively performing settlement be defined at the outset of the settlement-making process. Over-design of the process reduces spontaneous settlement-making activities.

WHAT WE SHOULD BE TRYING TO ACHIEVE: PERFORMANCE QUALITIES

The integrated approach on which the framework for settlement-making is based, makes it possible to identify performance qualities, which should guide plan-making and against which plans and settlements can be monitored and measured.

Environments reflecting these performance qualities have the following physical characteristics:

- they are scaled to the pedestrian, although commonly neither the pedestrian nor the motor car has absolute dominance;
- they are compact, having relatively high building densities;
- their structural elements are integrated and the composite parts reinforce each other;
- they have a strong spatial feel, with well-defined public spaces; and
- their spatial structures are complex, offering choices in terms of intensity of interaction, privacy of living conditions, lifestyles, housing options and movement systems.

Efficiency of resource use

The development of settlements requires the use of a wide range of resources, including land, money, building materials, manpower, energy and water. As a general principle, it is essential that resources be used as efficiently as possible.

Opportunity generation

People come to settlements to improve their personal welfare. The opportunity to improve one's lot derives from the economic, social, cultural and recreational opportunities resulting from the physical agglomeration of people in settlements. However, the capability of settlements to generate opportunities is not only determined by numbers of people, it is also affected by how settlements are ordered and made.

Of importance to developing countries, such as South Africa, is the need to create opportunities for small-scale economic activity. The reality is that, within the foreseeable future, large numbers of people will not be absorbed in the formal economic sector and will have to generate their own survival activities, via the small-scale - and often the informal - economic sector.

There are a number of ways in which spatial conditions in settlements create opportunities for economic activity.

- The first is *intensification*. This requires the promotion of higher unit densities than is the norm under the current model of settlement development. The case for increasing densities rests on a number of grounds. Higher densities create more opportunities for interaction, a climate in which economic activity - and small-scale economic activity, in particular - can thrive. A further effect of increased densities is an increased local demand for goods and services, promoting increasing specialisation and diversification in the small business sector.

The promotion of economic activity is also affected by the efficiency of movement systems. Efficiency of movement creates higher levels of support for goods, services and social facilities, simultaneously ensuring a wider range of goods and social facilities and increasing the viability of the services provided. In this way higher densities play a crucial role in achieving higher levels of convenience.

Higher densities lead to increased support for public transport systems, improving their viability. Higher densities, by lowering unit costs, can also contribute to the more efficient use of infrastructure.

Finally, higher densities can contribute to the efficient utilisation of land, the counteracting of urban sprawl, a reduction in travelling and a reduction in energy consumption and pollution.

- A second way in which settlements maximise opportunities is by integrating the *different parts of the settlement*, so that they contribute to each other. When a settlement is fragmented into a number of smaller, inwardly orientated parts, each part is largely reliant on its own internally generated resources. Consequently, levels of service and convenience may be low. By contrast, when the parts of a settlement are integrated, each part benefits from a much larger area. New settlements should accordingly not be viewed as ends in themselves only. They should also be viewed as instruments of restructuring, in the sense that they can be used to integrate a fragmented settlement environment.

  The above has implications for our thinking about movement. The challenge is to establish and maximise a continuity of movement systems, tying local living areas together. Movement systems need to be viewed not just as movement channels, but as spatial structuring elements. This line of thought leads to the conclusion that maximising access is as important as maximising mobility.

- A third way of increasing opportunities is by *enabling the evolutionary development of more complex settlements*. When this occurs, a diversity of large- and small-scale activities can find viable locations within the settlement system.

- A fourth way of creating opportunities is by *using the generating power of larger activities to attract smaller activities*, both of which benefit from the movement flows that result from the presence of the other.

Convenience

Good urban environments are, by definition, convenient. They allow inhabitants to conduct daily activities quickly and easily. Inconvenient environments, on the other hand, impose on lifestyles, reduce choices and increase costs.

Access lies at the heart of convenience. In this regard, access needs to be conceived of in terms of movement modes. The first mode is *pedestrian movement*, which is the lowest common denominator of movement and which describes the primary movement mode of large numbers of people in South Africa. The second is *motorised movement* in the form of public and private transport. Not all human activities and interaction opportunities exist within walking range. When this occurs, motorised transport becomes the more convenient movement mode.

For millions of South Africans, who cannot afford a motor car, public transport is crucial to facilitate movement. Although this does not deny the need to accommodate motor vehicles in settlements, the structuring of settlements, particularly for those who cannot afford private transport, should encourage and facilitate pedestrian movement and public transport systems.

Two forms of access are central to promoting convenience.

- The first form is access to the economic, social, cultural and recreational benefits which result from the agglomeration of people. This requires the intensification of settlements, the generation of opportunities for a greater range of activities and choices promoting more complex levels of spatial order and encouraging a greater range of development processes. Movement is the integrating structural element underpinning the above.

- The second is access to nature. Since settlements are, as a rule, places of intense human activity, the opportunity to escape from this intensity and to experience nature is of great importance to people. For many, for reasons of affordability, contact with nature has to be collective contact as it cannot always be provided adequately within private gardens. In addition, the productive capacity of the land can be a vital settlement resource. For many settlement dwellers the opportunity to use the land productively, or to engage in lifestyles which incorporate dimensions of both urban and rural living, is crucial to their survival.

Choice

Settlements which perform well are multifaceted places. They offer a diversity, and thus choice, of places, lifestyles, activities and interaction opportunities.

On the one hand, positively-performing settlements offer opportunities for human contact and interaction. Their activities and events play a major part in shaping the identity of the settlements. Importantly, settlements provide opportunities where people can live on their own but not be alone. They also provide people with choices regarding the extent to which they wish to engage in social activity.

On the other hand, people also require places which are private, particularly in the sense of knowing who "the locals" and who the strangers are.

The degree to which people wish to live in intensive and vibrant environments - or quieter, more private, places - varies from person to person and over the life-cycle of households.

The challenge is to promote environments which provide a *diversity of choices*, so that people do not have "either-or" choices, but rather choices which relate to relative degrees of privacy or exposure. The key to this lies in hierarchies of movement, public spaces and social institutions, and the design of living areas.

Equality of access

It is neither possible nor desirable for all parts of settlements to be the same. The reason for this is that clustering tendencies emerge in the structure of settlements as they grow. Activities requiring public support tend to cluster at the most accessible places. Nevertheless, it is important that all people have reasonably equal access to the opportunities and facilities which support living in settlements.

Spatially, two issues are central to this:

- The first is the recognition that balance is not so much a geographical as a structural concept. The issue is not one of attempting to achieve an even distribution of facilities over the surface of settlements. Rather, it is one of integrating public facilities and events with movement systems, so that access is equalised.

- The second issue is that of creating the access preconditions for more intensive activities to spread in a logical way, consistent with the growth of the settlement.

Quality of place

Quality of place is attained by embracing uniqueness as opposed to standardisation. In terms of the natural environment it requires the identification, a response to and the emphasis of the distinguishing features and characteristics of landscapes. Different natural landscapes suggest different responses. Accordingly, settlement design should respond to nature.

In addition, quality of place can be achieved by site-making actions, including topographical moulding in areas where soil is easily movable, to create greater diversity in the land form; tree planting, to provide areas of shade and recreation; the use of supplementary sources of energy and building materials; wind protection and space definition; the creation of water bodies as recreational features, sites of aqua-culture and visual relief; and creating choices of living condition.

In terms of the human-made environment, quality of place recognises that there are points where elements of settlement structure, particularly the movement system, come together to create places of high accessibility and special significance. These are the meeting places of the settlement. Business and commercial activities, schools, clinics, libraries, community halls and other facilities and activities requiring exposure to large numbers of people are associated with these places. In the best cases, the importance of these places is recognised in that they become the focus of public investment, aimed at making them attractive, user-friendly, and comfortable to experience.

They also become the places that accommodate symbolic statements, such as objects of remembrance. These, then, become the memorable places, which shape lasting impressions of a settlement. Their significance is strengthened by their dominant locations in terms of the movement network and from the significance of the social events or rituals they accommodate.

Sensory qualities

Positively performing environments reflect powerful sensory qualities. They are places which are aesthetically appealing and which add to the quality of peoples' lives.

The quality of the public spatial environment plays a critical role as far as the sensory qualities of settlements are concerned. The public spaces and places are the primary areas within which people engage in, and experience, urban life.

The role of public spaces in the lives of the urban poor is particularly critical. When people are poor, the full range of a household's needs cannot be adequately

met by the individual dwelling. Accordingly, a significant part of their lives is played out in public spaces. If properly made, these spaces can give dignity and a sense of permanence to environments. They are places where many social experiences occur and, in a real sense, they operate as extensions to the private dwelling. The implication is that all public spaces, of which the residential street is one of the important forms, should be viewed and constructed as social spaces.

It is the integrated framework of public spaces that enhances the sensory qualities of settlements.

Sustainability

Sustainability has two main dimensions. The one relates to the relationship between the built environment and the natural landscape. The other is the degree to which the settlement reflects "timeless" qualities .

- Settlements exist as adaptations of natural landscapes and are dependent on resources drawn from a much larger area. Two issues are central to achieving environmental sustainability. The first is the need to work harmoniously with the natural landscape, rather than causing breakdowns in natural systems, such as filling in wetlands to obtain developable land rather than developing higher-lying ground. The second issue is the need to recycle wastes to the greatest possible degree. For example, stormwater runoff can be used for irrigation purposes, and treated sewage as fertiliser.

- The second dimension of sustainability is the degree to which the settlement reflects, in its structure and form, "timeless qualities". Sustainable settlements accommodate growth and change well, and are in turn enriched by processes of change. They have three primary characteristics. They are scaled to the pedestrian. They reflect a structural order, which allows logical reinterpretation by successive generations. They have a strongly spatial feel, with defined and generously made public spaces, spaces not determined only by immediate development needs, but made with the recognition that public space is important in its own right.

PLANNING OF HUMAN SETTLEMENTS: THE ROLE AND IMPORTANCE OF STRUCTURE

The meaning of structure

Spatial structure is a concept used to interpret, design and make human settlements. The spatial structure of a settlement results from an interplay between the formally planned (or programmatic) and the spontaneous (or non-programmatic) dimensions of settlement-making. The planned dimension is essentially quantitative. It requires the identification of the major elements of land use and the development of a land and engineering services budget.

By contrast, the spontaneous, or non-programmatic, spatial structure is essentially qualitative, having at its core a concern with the whole rather than the parts. It reflects how people, over time, have addressed the making of a place to meet their needs and enrich their lives. Spontaneous environments reflect the timeless qualities referred to above. They do not depend on particular levels of technology, or minimum levels of personal means, to operate well.

The term "structure", as used here, refers to the creation of the public environment: that realm which is shared by all inhabitants, as opposed to the private realms of individual households and businesses. In investment terms, this usually equates with public investment in the spatial structure, to which private investment and decision-making responds.

The art of planning and design is to arrange the elements of structure into a system of references that supports the processes of living, and which establishes a spatial logic eliciting responses from the many actors who contribute to settlement-making. Settlement plans should therefore be able to accommodate uncertainty and change, rather than simply accommodate the initial development programme that necessitates the plan in the first place.

The elements of structure

In conventional planning, the elements of structure are described in terms such as circulation networks, public transport systems, open spaces, public facilities, and public utilities (engineering services). However, in the context of spontaneous settlement-making, it is useful to describe the structural elements as connection, space, public institutions and utility services. How each of these elements gives structure to a settlement is outlined below.

Connection

Connection refers to movement of all kinds, including fixed line systems such as roads, light - and heavy - rail systems, underground rail systems,

as well as pedestrian and bicycle routes. As a general principle, movement should be seen as an activity which occurs within space. The movement system, therefore, is the network of spaces through which people move in various ways, from the pedestrian mode to modes specifically conceived for fast movement. It is primarily within this network of movement spaces that the public life of a community takes place. Consequently, its making should be informed not only by technocratic considerations, but also by human and environmental considerations.

The movement system has considerable structural significance as it defines the pattern of accessibility, both within the settlement and between settlements. It is this pattern, in turn, which sends structural signals to individuals, entrepreneurs and place-makers, and which significantly affects the range of choices and opportunities the settlement offers inhabitants.

Space

Space lies at the heart of the non-programmatic approach to settlement-making. It is not just one element of a settlement programme, such as "public open space" (as designated in town planning schemes), but should be approached as part of thinking about the whole.

Settlements are characterised by diversity. They are many-placed places. Some parts are more public, others are more private, while others are more neutral, serving broader, more diverse sets of citizens and urban activities. It is apparent, therefore, that there is a structural order in settlements. This order lies at the heart of the concept of structure.

Public spaces are the meeting places of people in settlements. The public spaces comprise the urban "rooms" and "seams" of connectivity. There also exists a continuum of spaces, which represents a transition from more public to more private living. The order in settlements thus not only relates to access, but also to degrees of publicness and privacy. A similar order of publicness and privacy exists in relation to social institutions and activities, and places of perceived value.

At the heart of settlement-making lies the creation of a continuum, or hierarchy, of public spaces and movement systems, which attract, and give order to, activities, events and elements in accordance with their need for publicness or privacy.

Space becomes particularly significant when one is considering movement at a local scale. At this scale the concept of "road" needs to be replaced by the concept of providing spaces which are comfortable for people to be in, and within which movement can take place. In spaces so conceived, neither the pedestrian nor the vehicle has complete dominance or right of way.

Public institutions

Historically, the institutions which were most valued by society - such as institutions of learning, worship, exchange, markets and universities - served as the key structuring elements of settlements. The siting of these, in turn, formed the basis for the locational choices of other, more private, uses, such as housing. It is considered important to revive this tradition. However, a difficulty is that, in modern times, societies occupying settlements have become increasingly heterogeneous and diversified. As a consequence it has become difficult to identify institutions which have generally recognised value. This does not, however, negate the importance of thinking about settlement structure in this manner. In the absence of certainty about what institutions will be prioritised by communities, the social space itself becomes the highest form of social institution.

The location of institutions in relation to the other elements of structure is also of critical importance. Commonly, institutions occur in central places, are easily accessible in terms of movement patterns, and are announced by public spaces. The institution abutting onto the space gives unique character to the space and often attracts informal activities.

Public utility services

Public utility services refer to those engineering services that are essential to the functioning of settlements. They include water provision, sewage removal, stormwater disposal, solid-waste removal and electricity supply. These services are essential to the maintenance of public health in settlements. They can be provided in various technological forms, all of which have different cost implications and environmental and geometric requirements.

As a general principle, utility services should be provided as efficiently and as cost-effectively as possible, taking due cognisance of the human- and nature-centred approach to settlement-making proposed herein. However, in terms of structuring settlements, utility services should follow, not lead.

An approach to structure: minimalism and complexity

The appropriate approach to settlement-making is *minimalist*. This approach requires that the minimum number of strong actions necessary to give direction to the settlement-making process be clearly defined in the framework plan.

A failure to clearly define the minimum actions required will almost certainly destroy the quality of the whole. Essential public and private sector investments may not materialise, leading to unfavourable and unintended outcomes and failure of the plan.

However, if the plan for settlement-making goes too far, freedom, and thus complexity, will be reduced. A hallmark of positive environments is that they are complex. Complexity, however, cannot be designed. Environmental diversity results from freedom of action and the iterative application of the ingenuity of many decision-makers and actors in meeting their particular requirements, as well as the needs of their fellow human beings.

Spatial structure, in a sense, can be seen as the enabling "constraint" which gives direction, and some predictability, to settlement-making processes, without defining their precise form or outcomes. It is the function of structure to generate a range of opportunities to which individuals and groups can respond, and around which a diversity of human activities can take root.

While growth and development processes take many forms and are not always predictable, an enabling plan should nevertheless be aimed at unlocking the energies, ingenuity and resources of settlement-builders and implementing agencies. These include individuals, groups, communities, small and large developers, utility companies, investors, semi-governmental organisations and a range of governmental institutions and agencies.

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