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2014-03-06
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THE TECHNOPOLIS

EXPLORING THE URBAN ENVIRONMENT AND TECHNOLOGICAL CHANGE IN THE DISCOURSE OF URBAN DESIGN

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A thesis submitted to the faculty of Architecture University of the Witwatersrand, Johannesburg, in partial fulfilment of the degree Master of Urban Design.

Johannesburg
Nov. 1998

DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the degree of Master of Urban Design in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.

Zeky A. Adous
26 November 1998.

ACKNOWLEDGEMENTS

- To Almighty, for endurance and courage
- To DAAD, my sponsor, and Wits University for making this possible for me
- To Dr Roger Boden, for his valuable instruction and wisdom
- To Iain and Monica, for their inspiration and direction
- To Yaseera, for her encouragement and standing by me
- To my colleagues, Sintayehu, Wossen and Marcelle, for being there for me
- To Johan Olivier and Midrand MLC, for helping me get information
- To my family, friends and all who helped me through the difficult three years

ABSTRACT

The intention of this exercise is to investigate a specific area in the growing field of urban design, while learning in the process. As urban design is one of the practices that are directly affected by the pressures resulting from the current fast changes in our environments, it will be useful and fascinating to explore this dimension in the discourse. The theme of the discourse is therefore to reflect on the different thoughts and deal with the continual change in the Urban Environment that is resulting from technological advancements.

Technology is generally discussed as the human mastery in perfecting the tools by which humans attempt to control their environments. Therefore the Urban Environment is presented to be the reflection of human level of technological success. The thesis hence revises the understanding of the Urban Environment. It emphasizes the fact that the Urban Environment is a continually transforming entity, whereby urban designers are expected to continually come to terms with the emerging new lifestyles, due to changing technology and its impacts on the structures of urban environments.

While sharing the view that respects the values of the past (that have continued to shape human urban environments), this study advocates the maintenance of some sort of balance in design approaches, to also allow the accommodation of new technological environments. The study includes experimenting on reasonably bold but plausible design ideas. In doing so the exercise hopes to provide a stage for discussions and provoke innovative thinking by urban designers, that will be useful to the discourse of urban design.

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CHAPTER 1:
INTRODUCTION

1.1.0 Background

This is an urban design study that focuses on the relationship between technology and the Urban Environment. It attempts to investigate the impact of technology on the form of the urban environment. The aim being promoting good human environments, the different degrees of new and old, unusual and conventional polarities created due to technological changes are explored.

The study utilises an argument that is based on the understanding that technology is an unavoidable social force of change. Any attempt to avoid technological environments would be against the general trend in the development of society.

The Urban Environment is presented as a reflection of technological achievement. It is only an expression of human success in controlling their environments. Thus throughout history the Urban Environment has undergone waves of stages of development parallel to technology. Recently rapid developments from service to knowledge based society have demonstrated faster transformations in the shape of the Urban Environment and life of people. Already, before people have taken time to adapt to the implications of the information age, a new wave of science based economy (BioSciences) is nearly upon us (Worthington 1995).

The factual implication of all of this is that change influenced by technology in the urban environment is accelerating faster than ever, leaving few time-space to adapt. Means of dealing with the resulting rapid change will thus be the area of this study.

In so doing the discourse initially intends to explore the nature of the emerging urban life. Urban designers are required to understand and come to terms with these realities in order to be able to moderate and steer change in the appropriate direction. These urban realities may not be those favoured by most of us. But if we are to direct our urban destinies we need to understand the pressure, and then present a vision

for an alternative. The exercise does thus attempt to review approaches of responding to change for urban designers, in their endeavour to shape the Urban Environment.

The study will focus on the relatively advanced technological societies of the world, as the impact of new technological change is first observed in these areas in its intense form. The study does not thus claim to represent the most primary concern of the greater proportion of urban environments of the world's surface at present. Since the majority of the world's urban population lives in less developed urban environments it would appear that what is attempted as a focus in this study is not necessarily a priority in urban design concern. However, it should be noted that the arguments raised in the discourse are not only reflected in the leading cities of the world. Therefore, wherever there is urbanisation a position taken regarding this will continue to affect urban design decisions taken directly or indirectly.

As a case study the exercise will explore a specific context in Midrand. The intention will be to test the outcomes of the outlined discussions in a fast growing, and thus changing city of South Africa, in providing an urban design proposal. Midrand, as a South African city demonstrates both first world and third world conditions (Boden 1991). The exercise in looking at this area as a case study therefore highlights the topic under discussion as not necessarily a developed-world-only concern. However, because of the nature of the focus of the discourse, no further attempt is made to reflect on the social, economic, political, and other aspects of the city. (which are believed to be the other major direct components for Change)

1.2.0 Definition of key terms

It is established that a clearer meaning should be attached to some of the most important words and phrases used to describe the scope and the content of the discourse. The following terms are defined in the discourse as follows:

Technopolis:

Ingram refers to Kitto in "The Greeks" (1951) and notes that "...while the Greek word *polis* is often translated as city-state it actually meant much

more than this and was in many ways a philosophy of life rather than the physical entity of the city". The polis implies the sense of interaction with other people and the direct participation in the administration of the urban environment. The title of the discourse therefore combines *technology* and *polis* to expressively denote the area of concern for the discussion.

Urban Environment:

In Brotchie et al (1985) urban form is used to refer to the pattern of residential and non-residential urban activities and their interactions as expressed by the built environment which accommodates them. The definition of the urban environment as used in the discourse emphasises the man-made element of urban form. The `Urban Environment' is preferred to the `City' to avoid the classical understanding contained in the `City'.

Rapid technological advancement:

Batty (1985, p50) refers to high technology as: "...electronics, computer, medical based activity, or indeed any activity which is knowledge based and capital intensive." The discourse utilises Batty's (1985) definition of high technology as resulting in rapid technological advancements. Rapid technological advancement is in addition used to imply the latest changes in life as a result of these most recent technological inventions.

Design exploration:

Expresses that part of the study, which makes it unique in that as it is judged by the qualities of the urban design process, and product.

1.3.0 The Controversy

Mumford expresses the question that humanity at this stage is confronted with, as: "...a question of whether man shall devote himself to the development of his own deepest humanity, or whether he shall surrender himself to the now almost automatic forces he himself has set in motion and yield place to his dehumanised alter ego." (Mumford, 1961)

Because the Future is technologically determined, and is inevitable, many people thus believe that the future of our urban life is beyond the

reasonable control of man. There is an inherent belief that there is very little people can do except, to accept the facts and adjust to the new realities.

On the other hand, many still share the belief that the future lies in our hands. Therefore irrespective of which direction forces of change are pulling, the decision is for us to determine the nature of our urban life.

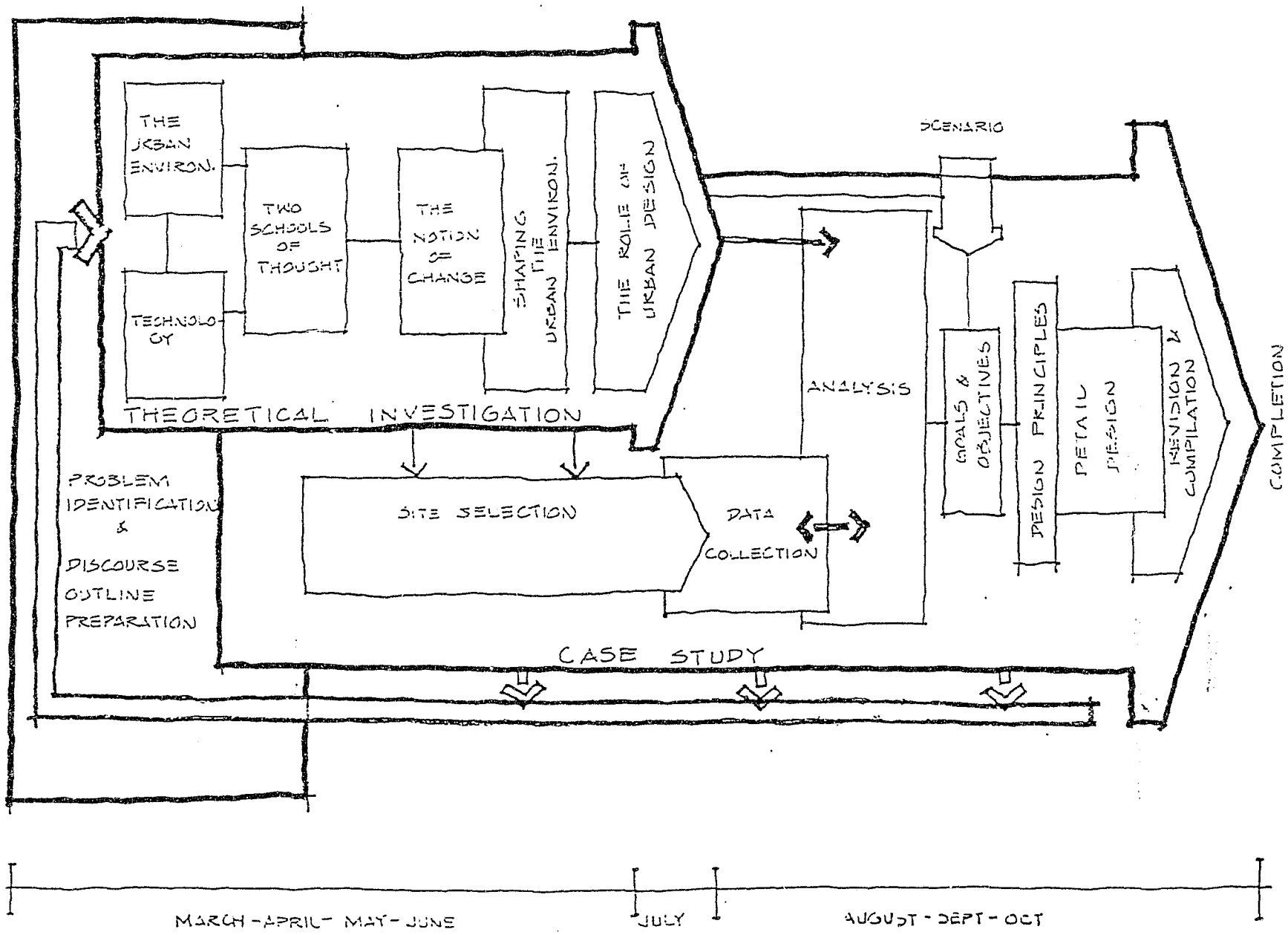
The study intends to entertain these two viewpoints and their implications on the shaping of our environments. As a result two different urban design thinkings are expressed as stemming from the two different philosophies. It is finally recognised that both provide design approaches that contribute to the general shaping of the urban environment, in two complementary ways: providing vision, and being practical to the day to day level. (In the tradition of Alberti, and Brunelleschi).

1.4.0 Aim of the Discourse:

The aim of the discourse is to explore relevant theories and finally arrive at some design principles. The theoretical investigation includes different philosophical views regarding the direction of the Urban Environment and change. The principles discussed will inform the urban design framework that will be outlined in the case study later. In so doing an urban design proposal will be developed for a specific site in Midrand. Finally, the aim of the discourse is to benefit from the exercise of researching in urban design.

1.5.0 Presentation and Procedure

The presentation and procedure of the discourse is divided in to two parts. The first part covers the theoretical investigations. The second part utilises the outcomes of the discussions from the first part and attempts to demonstrate an urban design exercise on the case study. A diagrammatic explanation relating the components involved and procedure followed is provided. (Fig 1-1)


THE URBAN ENVIRON.
TECHNOLOGY
TWO SCHOOLS OF THOUGHT
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THE ROLE OF URBAN DESIGN
THEORETICAL INVESTIGATION
PROBLEM IDENTIFICATION & DISCOURSE OUTLINE PREPARATION
SITE SELECTION
DATA COLLECTION
CASE STUDY
SCENARIO
ANALYSIS
GOALS & OBJECTIVES
DESIGN PRINCIPLES
DETAIL DESIGN
REVISION & COMPILATION
COMPLETION
MARCH - APRIL - MAY - JUNE
JULY
AUGUST - SEPT - OCT

PART ONE: THEORETICAL INVESTIGATION

CHAPTER 2:
HISTORICAL PERSPECTIVES OF THE URBAN ENVIRONMENT AND TECHNOLOGY

2.1.0 Introduction

This section aims to provide a basis for the discussions to follow in the next sections. It attempts to do so by outlining a larger historical framework for an understanding of the human urban environment and technology.

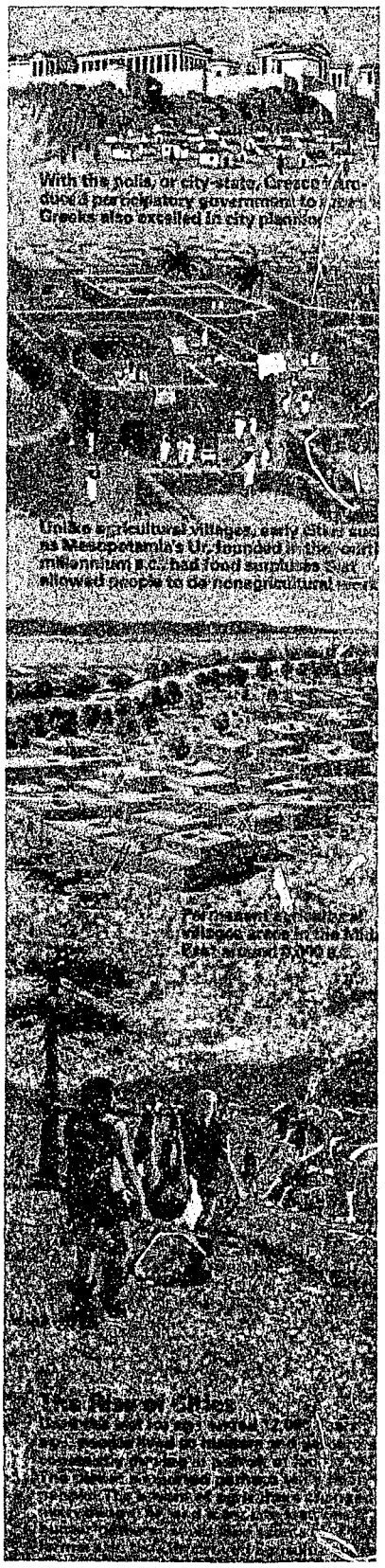
The origin, purpose and history of the Urban Environment need to be understood in order to relate to the urban realities of today. This will also be useful for deciding which of the urban conditions we must protect and which ones we must let go.

It will be seen that the cradle of civilisation and its course in history are related to the ordering of human settlement. Hence technology as part of the instrument and product of civilisation is covered in reasonable depth. The impact of technology on the Urban Environment is highlighted, leaving the more direct consequences to later sections.

2.2.0 Origin and evolution of the Urban Environment

The history of Urban Environment goes more than five thousand years. The Urban Environment was not born suddenly. Following the processes and human achievements, it had undergone stages both in purpose and structure to arrive at what we know as the City today.

It is all the history of man and his growth in shaping the earth and civilization that one would need to see in trying to trace the urban settlement and the shaping of the city. In the very beginnings and probably always forms of lessons learnt in any part as man's technological achievements are passed to other parts of the landscape. Hence Mumford (1991) writes, "...The domestication of plants and



animals, the domestication of the natural landscape all went hand in hand."

According to Mumford (1991, p 13): "Before the city there was the hamlet and the shrine and the village, the camp, the cache, the cave, the cairn: and before all of these there was a disposition to social life that man plainly shares with many other animal species."

The one thing that has always remained true, in the development of human settlements, is that humans have always found reason to establish a fixed living place and hence a continuous settlement. From the time of early humans when they organized their lives based on respect for the dead, to the days of the agora; from the ordering based on specialized market to the more complex structure of the city based on the trade relations and sophisticated institutions there has always been a core role that formed the urban settlement.

Humans inhabit in a concentrated manner originally for survival and protection. Their survival includes socializing and production, and hence meeting basic survival necessities. But the origin of a more complex urban settlement like the City is composite. The various schools of urban origins are familiar, and they involve chicken-and-egg circumvolutions (Kostof 1991). These mention the factors as: positive ecological base, a site favorable to trade, a complex social organization, and political social structure. One of the most crucial explanations includes that an advance technology like large-scale irrigation works, metallurgy, animal husbandry etc have contributed to the genesis of Urban Environments.

Therefore Cities began when there occurred a shift away from a simple, self-satisfying village economy. Surplus production beyond the immediate needs of the community made possible the emancipation of some people from the toils of the land, and this created the opportunity for specialized tasks and the groups associated with them, namely, scribes, craftsmen, priests, and warriors. Surplus production presumes irrigation, and efficient irrigation systems presume a complex bureaucracy, and that means Cities (Kostof 1991).

Cities have a purpose to make sure that the protection, sustenance, and continuation of their creators are secured. Their downfall occurs when



may fail to do so. As human interrelationships and their interaction gets more complex an even more complex forms of urban environments arise. One of the most important duties of Urban Environment has always been to ensure the survival and transmission of the civilization to the next complex stage. As Mumford explains:

"From its origins onward, indeed the city maybe described as a structure equipped to store and transmit the goods of civilization, sufficiently condensed to afford the maximum amount of facilities in human space, but also capable of structural enlargement to enable it to find a place for changing needs the more complex forms of a growing society and its cumulative social heritage". (Mumford, 1991)

As human functions in life get more complex it should be expected that even newer and different forms of urban environments from what is known to us today would occur. The one secret power that the city throughout history has always possessed is the `Magnet'. Today, one may say it is trade or technology or jobs that attract people to the city. Long before materialism and the consumer age however, there has always existed this Magnet that brought people together. People have an inherent or in built desire to meet for spiritual stimulus, for intercourse and for growth and development. One could therefore correctly assume that the 'Germ' of the city is in human interaction, which is expressed in meeting `places'. How that meeting takes `place' takes different forms with different technological developments. At some stage in the development of the Urban Environment these social needs might be met in other ways. Ingram illustrates on the already immerging form of new world of interaction: The Virtual City. This city does not have to adhere to the physical constraints of the real world as most of us know today, while still retaining the qualifications of the purposes of the Urban Environment.

In different stages therefore, different forms of urban environments will continue to occur. The origin and stages of developments will remain reflections of human technological developments.

2.3.0 Technology in the Urban Environment

Anthropologists locate the existence of humans on earth as far back as 2.5 million years ago (Cipolla 1980). As technology is merely the result of increasing complexity of tools, the human technological adventure begins when the early primitive man began producing and using tools.

All or most of the major transitions in the development of human history; (like the Neolithic revolution where hunting and gathering gave way to sedentary farming, and the industrial revolution where manufacturing displaced agriculture as the dominant source of work) have been linked primarily to technological change, whereby new materials, products, processes and organizational processes have been substituted for old.

In order to briefly cover the development of technological achievements based on their traces in history it is important to see the following two broad stages: Pre-Industrial and Industrial Periods.

Pre industrial

Innovations in technology have always contributed in bringing about major reforms in society and its settlements. The Agricultural and Neolithic Revolutions were two of the most important shifts that changed the face of settlements forever during the Pre- industrial times. These shifts have been followed by dramatic worldwide change as movement of people around the world continued.

It was not however, until the middle of the 19th century that the contribution of science to technology has started to be seen in its fullest devotion. The society, in the 16th century on, had to undergo a Cultural Revolution to create the preconditions that made this possible. Traditionally, technology had been the realm of craftsmen working by rough rules of `trial and error'.

With the development of an urban, mercantile economy a reaction to the classical view occurred which came to be known as the Scientific Revolution. This meant that the traditional conception, which had reigned from Aristotle to Thomas Aquinas, was now to be challenged (Cipolla 1980). And there came about the great struggle for the survival of the two approaches, the `moderns' and the `ancients': A reaction to traditional

values imposing the experimental method and a battle to retain the classical elite tradition.

Industrial

The face of the world once again saw a major change, in fact a leap forward into a new world discovery of new forms of energy. This began in the early 18th century known as the Industrial revolution. Traditionally the sources of energy that humans needed had been limited to the direct products of animals and vegetables. The latest mechanized technology now made possible the use of coal, oil electricity and the atom."...A world in which man found himself able to handle great masses of energy to an extent inconceivable in the preceding age." (Cipolla, 1980, p158). In a very short period of time, this new civilization had spread in Western Europe, changing both institutional and human structures.

In the beginning of the 18th century extraordinary expansion in commerce and manufacturing arose: the emergence of a large merchant class endowed with remarkable managerial ability, economic power and social and political influence, an impressive stock of manpower, both artisans and professionals, and a relative abundance of capital. In the realm of ideas, the main characteristic was as aptitude for things mechanical, and a strong and growing inclination towards quantitative measurement and experiment.

Unlike the pre-industrial world where ideas of Hippocrates still provided the bases of medicine, and Roman treatises were usefully referred, the Industrial period has become a totally new advance where few of the classical values remain useful except for historical interest. Some of the latest achievements of this era include: The discovery of the steam engine that made movement and transport possible like never before. This was followed by oil extractions that lead to the perfection of combustion engine. The end of the century saw the introduction of electricity. And in the middle of the 20th century man began to exploit atomic energy.

Most important discovery that this age provides us with is the invention of "the method of invention" (Cipolla, 1980,p159). Thus the use of new discoveries made an efficient use of already existing energy forms and achieved a cycle of inventions.

2.3.1 Technology as a force of change

Technology appears to be an autonomous force which is beyond human control and which is pushing society along with it. On the other hand it is argued that technology itself is only being shaped by other forces for example economic forces. Obviously technology is not the only source of change that drives society. Nevertheless, it is indisputably "the major force behind the accelerative thrust" (Toffler, 1974, p42).

The role of technology therefore, in influencing the shaping of the Urban Environment is obvious. However, we must not let this distort our sense of relative importance of the factors at play. Many writers agree that `technology is not the source of human activity. Technology is the product of the human mind that results as a response to some historical circumstances of a peculiar character, and as part of the total human experience. It is however important to note that it is not completely true to say that technology is a complete natural process and is almost an inevitable product of some need posed naturally. Nature poses a certain challenge to humans. Humans fully explain these challenges in a more refined way and attempt to respond to them. These make humans' needs relative to their context because how these needs are explained will be dependent on how the challenges are perceived.

Mill's (1967) `Cultural Apparatus' explains a domain by which challenges are perceived, and needs are met and created in Modern society. Such domain in a very complex manner explains and fulfils the most functions: it conquers nature and transforms the environment, it defines the changing nature of man, and grasps the drift of world affairs, it revifies old aspirations and shapes new ones. Technology, in turn has deeply affected and continues to affect the structure and culture of society. In general, the size, the physical environment and the composition of the population is affected by technology.

2.3.2 Technology as an unavoidable social force

Technological development is understood to be linear and it only progresses in a forward direction. Hardly, it is practical to imagine reversing this direction. The Unabomber's Manifesto in support of this point of view note that once technological innovation has been introduced, people become dependent on it, unless it is replaced by some still more advanced innovation. Not only do people become dependent as individuals on a new item of technology, but even more, the society (and thus the system) as a whole becomes dependent on it. Thus, unlike all social arrangements (which have proved to be transitory) the social structure that is dependent on technology can only move in one direction, `towards greater technologization'.

It is further pointed out that no social arrangements, whether laws, institutions, customs or ethical codes, can provide permanent protection against technology. And therefore it is difficult to attempt to stop the path followed by technology in such a way as to prevent it from compromising human `freedom'. The Unabomber's Manifesto illustrates that, "there has been a consistent tendency, going back at least to the Industrial Revolution for technology to strengthen the syst , at a high cost in industrial freedom and local autonomy. Hence any change designed to protect freedom from technology would be contrary to the fundamental trend in the development of our society. Consequently, such change either would be a transitory one –soon swamped by the tide of history- or, if large enough to be permanent would alter the nature of our society".

Therefore neither reform nor revolution would stop technology to continue to be one of the most influential social forces. Rather, (as will be promoted in the discussions of this discourse) it will be useful to attempt to benefit most from technology in making out of it a useful social force.

2.3.3 Stages of Technology

Toffler (1975) discusses three stages through which any technological innovation passes. These stages are linked together into self-reinforcing cycle. First, there is the creative, feasible idea. Second its practical application. Third, its diffusi n through society (Toffler 1975, p43). Once

embraced, it will become an important force of change affecting all aspects of the urban environment.

Although inventions also happen accidentally, what it takes to come up with new technology is not so hard to imagine. The practical application and diffusion into society doesn't happen very easily either. The society naturally if not reject reacts to any new technology before it finally embraces it. Naisbitt (1984) writes about the different stages that technological development has to traverse in the society forming a complex cycle. Initially, the introduction of a new discovery should be taken easy. This will demand that it surfaces only along the areas of least resistance. "During this stage, technology is applied in ways that do not threaten people...reducing the chance that the technology will be abruptly rejected. Example is the first applications of microprocessors as toys, and as robots where job is not safe for humans".

Once the new technology is made familiar the next stages will see its use in improving previous technologies and finally, its application in bringing real transformation in the urban environment. Obviously, these stages don't take place overnight and the effects are not observed. But as universally observed now, the stages are now occurring in much smaller gaps.

The stressful situation created in societies is hence due to the birth of the next stage before the complete embracing of the previous. This means rapid adaptation to new ways and giving up `old' ones with not much time to compromise.

2.3.4 Impact on Urban Form

Ever since man's invention of his first tools, technological change has facilitated the organization of human activities and their interactions; hence the total settlement structure. The spatial patterns therefore kept changing with the development or shift of societal modes of production. In pre-industrial society, production was predominantly agricultural and occurred outside the cities. The industrial revolution reversed this pattern with manufacturing production emerging as the major activity and occurring in the inner city areas. In the postindustrial era, this pattern is

again reversing with production moving largely to the metropolitan periphery and beyond. (Brotchie et al 1985)

The impact of new technology in the past few decades for example made this changing pattern even worse. Rapid transit systems, microelectronic and telecommunications do have profound consequences for the spatial organization of the urban environments. Consequently, as Nijkamp admits, contrasting developments take place, varying between continuing suburbanisation and increasing popularity of compact city patterns. (Brotchie et al 1985)

Most recent developments of the past 2 to 3 years in computing, networking and virtual reality technologies are creating even newer conditions in the Urban Environment. These are gradually approaching the level of maturity where large scale multi-user virtual environments will be possible which, "... will inevitably lead to the development of large scale spaces for the on-line community to meet, socialize and carry out business" (Ingram).

Therefore, the form of urban environments never exhibits a static pattern as long as human adventure in technology and its influence continues.

2.3.0 Summary

This section has reviewed the traces of the Urban Environment and history 4of technology in an attempt to uncover their relationship. It has then become apparent that the development of the city and the successful delivery of its core function could not be viewed separately from the technological achievements of man. The development and history of urban settlement is actually the history of human civilization. Technology initiates change in social, economic, structural and other aspects of a society and, hence plays the major role in establishing development in the urban environment.

Therefore it has been argued that the one directional development of technology (as a tool) is unavoidable should civilization be necessary to human success.

CHAPTER 3:
THE PRESENT REALITIES AND THE FUTURE
OF URBAN LIFE

3.1.0 Introduction

The role of technology as being an influential force in the shaping of urban life is pointed out in the previous section. It has been shown that at present, the rate of change as a result, is faster than ever. Therefore it is quite helpful to attempt to anticipate the next direction, most importantly to all those directly involved in the shaping of the urban environment. In so doing, it is found that, not only the historical course, but also the present realities of the urban society in general should be understood.

Therefore some of the most prominent urban conditions that have occurred, and are resulting due to technological developments, and thus contribute to the structure of urban environments are presented in this section.

3.2.0 Development trends

A simple analysis from the previous coverage of the brief historical development of technology and the city would disclose the fact that change is taking place at a more rapid pace than preceding years. While the shift from an Agricultural to Industrial society took some 100 years, we just took two decades to reach to the change that we are experiencing today: the change to Information society. Therefore the rate at which change is occurring is so rapid that it is not leaving us with much time to react. For any participant in the shaping of the urban environment at this stage it will be helpful to be able to anticipate the possible future: where we are heading.

The best way to do so however is by understanding the realities of the present social and urban life. Naisbitt (1984) in trying to examine the past few years have explored some major shifts that have occurred and occurring in the Urban Environments. These trends would very practically apply to most of the developed societies of the world. Similarly, they reflect the urban realities of the study area of this discourse, as they affect the development trends of the growing urban environment of Midrand. The following headings will thus discuss the most important current trends that are contributing in the shaping of urban environments.

3.2.1 Information Society

"During our agricultural period, the game was man against nature. An industrial society puts man against fabricated nature. In an information society - for the first time in civilization- the game is people interacting with other people". (Bell in Naisbitt P10)

Today the urban society is once again in the middle of an important social shift in history. Toffler (1974) calls it the Third wave, the transition from a society based on work and industry to one in which leisure pursuits will dominate. Many people have referred to it as the Post-industrial society (Batty, 1985,p44). In the Industrial era capital has been the main resource driving the economic motor of a society. But the strategic resource to the economic system of the outlined societies is now being substituted by information. As Drucker says, the productivity of knowledge is becoming the key to productivity, competitive strength, and economic achievement. Knowledge is becoming the primary industry that supplies the economy the essential and central resources of production. Naisbitt (1984) claims, "We now mass-produce information the way we mass-produce cars", hence the name, Information age.

There is one important difference between societal changes due to the technologies that have occurred previously and the present one. The past technologies had brought achievements in extending human physical power, whereas this society has succeeded in extending the `brain power' ultimately. Stonier (1985), in explaining the technological advantages of the present society says: "Radio and telephone were an

extension of the ear, film was initially an extension of sight, then coupled to sound, television an extension of the brain. It has always been the function of technology to extend human capabilities. To extend human neurological capabilities is qualitatively different from extending human musculature. This new technology was bound to create profound changes in society."(Stonier, in Brotchie et al 1985)

This whole new direction has been facilitated with the great innovations in all aspects of communication. The introduction of increasingly sophisticated information technology has revolutionized the route on which communication depends: Sender, receiver and the channel. Through these technologies, a faster flow of information is made possible, bringing the sender and the receiver closer together, in Naisbitt's terming, "collapsing the information float". Any changes thus that are occurring will occur much faster because of this foreshortening of the information float.

Collaborative Virtual Environments (CVEs)(Ingram), is for example, one of the latest developments which this society will be able to utilize. With such technologies people are able to interact with each other in a simulated 3D spaces.

One of the advents of this technology is its ability to separate flows of information from traffics of other movements, processing of goods and materials. The consequences of such dramatic innovation in technology will therefore be reflected in every aspect of life which will fundamentally affect the Urban Structure.

3.2.2 Decentralization

Today, one other aspect of urban realities is the nature of physical growth of urban environments. Urban environments are sprawling horizontally, resulting in decentralizations. Webber (1982.p149) writes, "City expansion in the late twentieth century is taking place in those locales where opportunities for leisure – time activities are plentiful and where the undesired side-effects of older high-density settlements have not yet accumulated".

The causes of decentralization are many and composite. Moreover, each urban environment is unique and exhibits its own cause for its physical growth. Generally speaking however, advents that come up with technological innovations are known to contribute in the facilitation of the decentralization trend observed worldwide.

Originally, the mass industrialization was organized according to the principle of economies of scale that is, the more you produce in one place, the cheaper each item will be. Unlike the industrial time where it was necessary that all employees be in one place, in the present it is practically possible to start and run a business with only few of the technological advents like the telephone and a personal computer. Consequently more and more urbanites are finding it possible and attractive to spread out to small towns and suburbs leaving the industrial cities as, "decaying monuments to past civilization". (Naisbitt 1984)

As decentralization occurs people diversify and their homogeneity is diluted. It can logically be seen that they grow and develop their differences in a more localized fashion. Blumenfeld (1982 in Brotchie et al 1985, p 360) when describing the resulting population illustrates, "..this universal 'urbanization' of the countryside also means an increased 'ruralisation' of the urban population with increasing numbers living in small municipalities rather than cities..."

With decentralization on the other hand, greater opportunities are also created. The traditional constraints of industrial and service sector locations are less applicable. What is resulting here is, as Pressman (1985) expresses, "...an emerging phenomenon which parallels the old adage 'population follows jobs', which can now be expressed as 'jobs follow population'."(in Brotchie et al 1985,p351)

3.2.3 Communication and Mobility

The past decades of the 20th century have seen the increasing importance of information technology and its perfection in the different modes of communication. With this development the need to move around and be

there in order to communicate is no longer a must. But will this advent of advanced technology in telecommunication ever substitute the human need to mobility?

The idea that telecommunications technology could substitute for travel appeared soon after the invention of telephone. This idea resurfaced in the 1960s and 1970s, as computing technology began to permeate society. But today with fax machines and personal computers and videoconferencing almost common, Mukhtarian observes that "..movement and congestion on the road is worse than ever." Mukhtarian (in Scientific American 1997 p61) further indicates that Historically, transportation and communication have been complements to each other, both increasing concurrently rather than substituting for each other.

Recent work by Andreas Schafer may explain why, despite all the problems associated with the automobile, people still are on the road and traffic in the city gets even worse and worse year after year. The urban environment does everything to make this possible: rearrange its communities, introduce more and more networks of roads and so on. Drawing on decades of travel surveys Schafer found that city dwellers in the U.S., Europe, Russia, eastern Asia and even villages like in Ghana share two important traits, which appear to have remained constant for at least 30 years. First, people in each location spend an average of 60 to 90 minutes travelling a day. And in every industrial country except in Japan, people spend an average of 10 to 15 percent of their income doing it. (Schafer in Scientific American 1997 p36). Relating mobility to income, Schafer concludes that, as average income increases, the annual distance traveled per capita by car, bus, train, or aircraft rises roughly the same proportion. Therefore it can be said that it is an international trend that people will keep moving and buying mobility if they afford. As Waches declares, "Mobility is an underrated human right, you can never have enough of it".

What comes with this increased mobility is that people do not just move around but away from the city, as pointed out in the previous section. Mc Shane observes, "The horse car allowed city dwellers to move out to single- family homes. Then the laying of rails lowered fares to a nickel, allowing movement into the suburbs. And by the time autos appeared, cities had already begun to sprawl along the main rail lines".

In the next millenium, with higher expectancy of income in different parts of the world, higher mobility is expected. More and more people will thus find it possible to easily move around the city and away from it. Accessibility to places where people think is less crime, better recreation, less congestion, will increase for many.

The notion of telecommuting however not ruled out by many. The commute to work can be now reduced with telephones, faxes and e-mail. How feasible this is to the larger society however still is a question. Because for many, the commute to and from their job is still a desirable buffer between home and office. And many more things that cannot be replaced by the use of intermediate channel, like the professional and social interactions will still remain a problem.

3.2.4 Globalization

One of the latest trends in urban life is expressed in the emergence of a global society. This is, "basically an open society: multipolar, multicultural, self-governing, and competitive".

According to Knight (1989) the success of cities in the face of the powerful economic and technological forces will depend, "...on their ability to anticipate and adapt to the challenge of a global society. No city can afford to take its future for granted; history is a `graveyard of cities'."

3.3.0 Into the future

It has been pointed that whilst technology will free man from many of the earlier reasons for central cities, the urban environment will continue to survive because people will still want to come together. The type of the Urban Environment that will predominate in the future however will remain a function of the available technology and thus, lifestyle.

Many scholars have examined the possible future of the city. With the fear of possibility of the city to give up its heritage, some suggest that as the millenium progresses it is becoming likely that urban designers are to be called upon to create development schemes which will enhance the individual identity that makes a place special.

In his exploration of the future of urban environment Worthington examines what he terms the `logistical economy' –the management of space and time. Due to advances in technology people are able work not only from home but also from almost any location and at any time convenient to them. Thus, new types of businesses and new ways of operating have emerged which we would not have even considered in the recent past –physically dispersed, global industries operating 24 hours a day, joined by advanced telecommunications. The effect is shrinking of time and place.

But Worthington's conclusion emphasizes that no amount of technology will replace the need to meet face-to-face but the urban environment of the future may comprise `mixed function, high intensity centers inhabited by like minded professionals. These centers are likely to be dominated by public transport, indeed the airport and railway station of the future may well become a destination in its own right rather than a place to move through'.

This model is expressed to pose particular urban design problems through the increasing privatization of the public realm, polarizing the `haves' and the `have-nots'. (Black)

Architect and design critic of the Sunday Times, Hugh Pearman challenges the popular vision of the future city as a `Blade Runner' environment- full of pollution, crime and deprivation. Pearman suggests an alternative vision of `New' city that would provide increasingly better public transport and become a place with culture, restaurants, hotels, clean air and more and more green spaces. In contrast the `new' countryside could become a car dominated, smog filled, noisy, congested hinterland- overpopulated with `work-from-homes' making their way between country cottage and out-of-town shopping center.

The Leeds example

Taking Leeds, as an example the Leeds Conference has attempted to explore the challenges facing the design professions in the next millenium.

Leeds is in a state of changing image gaining terms like `European City' and `Capital of the North' as a result of new growth sectors based on a buoyant financial and legal services industry, allied to an emergent role as a strong regional center. This is evolving Leeds " from an archetypical northern manufacturing center to become a place that is now heralded as an urban development success story" (Black)

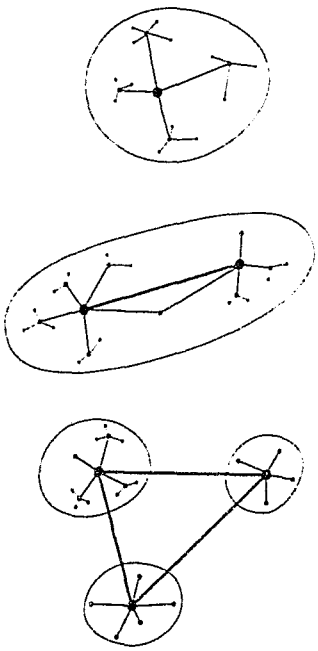
Leeds today is at the forefront of the 24 hour city movement which aims to revitalize city centers by transforming them into places that people want to linger in, rather than get out of as soon as the working day is over. Although the 24 hour city initiative has only concentrated on the evening/night time economy as yet (clubs, cafes and bars), the genuine 24 hour city is to include more activities. This initiative extends to encourage participation by a wider spread of age groups. The long neglected waterfront, `The Calls', once dominated by derelict mills and wharf buildings has been transformed into a vibrant area for leisure, entertainment and is home to a cluster of new computing and programming businesses. Leeds continues to grow as a cultural capital, and with all the new interventions coming up it is expressed to be a demonstration of the future city as a place that is a focal point for all that is good about urban life.

3.4.0 Emerging urban agglomerations

Most modern theorists of urban environment acknowledge that transitional processes are having increased important influence on the evolution of the Urban Environment. An early observation was the recognition of an emerging system of world cities a kind of urban elite which is shaped in part by the new international division of labour (Hall in Batten 1995). Underpinned in particular by rapid advances in the development of information technology and telecommunication the view

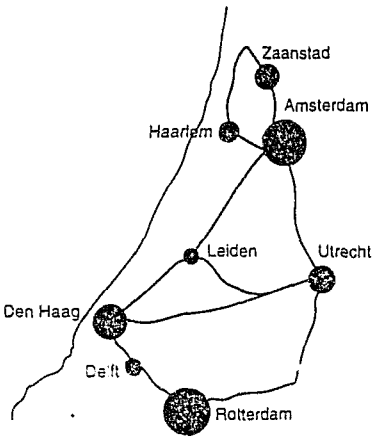
of world cities as a `key nodes' of the international urban system is becoming a largely held one (Batten 1995).

The advent of technology however, is having an impact on more than just the largest metropolitan centers. Another example is the `transfrontier metropolis' (Herzog in Batten 1995). The emergence of urban settlements straddling international frontiers reflects a selective integration of border territory into the circuitry of the global economic system. In certain European and American border regions, transfrontier metropolises may eventually become new centers of production and urban life.



Three urban configurations: the monocentric city, the corridor city (*centre*) and the network city (*below*).

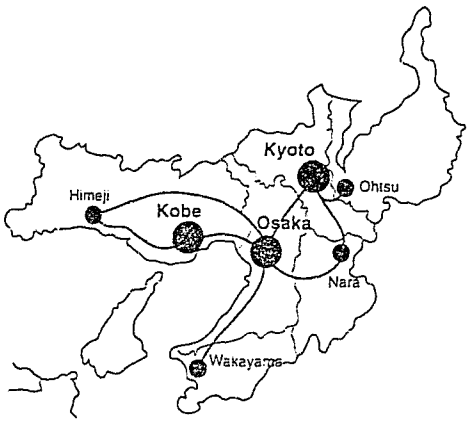
Some urban environments are undergoing another kind of metamorphosis. Efficient corridors of infrastructure link knowledge intensive centers to large metropolises. European examples include the London Cambridge and Stockholm-Uppsala corridors. Each of these hi-tech corridor developments incorporates an international airport. Since the airport- university combination turns out to be one of the most synergistic factors currently contributing to faster and more prosperous urban growth. Such highly accessible places nurturing higher level of knowledge-based activities are expected to prosper in the 21st century (Batten 1995). "...In these bicentric urban systems, close links have been forged between places of complementary function, rather than simply on the basis of distance or demand thresholds. Relational linkages tend to be horizontal rather than hierarchical. The resulting urban configurations take the form of `corridor cities' ".



Randstad Holland

Still another form of urban agglomeration is apparent, consists of an intricate web of corridor cities. These urban systems may be thought of as `network cities' because of the manner in which their polycentric structure has evolved. Interest in them has increased recently, following claims that certain network cities may enjoy greater diversity and creativity, less congestion and more locational freedom than monocentric cities of comparable size. Two examples of these growing number of urban agglomerations are Randstad Holland and Kansai, Japan.

Randstad Holland is a classical example of otherwise a predominantly recent trend of polycentric urban development. Shaped like a giant horseshoe, this complex urban agglomeration contains three major conurbations grouped around the cities of Amsterdam, The Hague,



Kansai, Japan

Rotterdam and Utrecht. Other smaller centers such as Delft, Haarlem and Zaanstad serve as additional nodes.

Kansai (see chapter 8) is a result of an innovation case of network cities that is developing in Japan. It is made up of the six prefectures of Osaka, Hyogo, Nara, Wakayama and Shiga. After many years of competition with Tokyo, this historically powerful area of Japan appears to have recently gained greater confidence in its ability to offer attractive alternatives to the national capital.

3.5.0 Summary

This section has attempted to highlight on the nature of the present urban society and that it is in a state of transformation. The advent of technology, while freeing man from the constraints that have limited the nature of urban environments, is now enabling faster and efficient ways of communication. This is conceived to contribute to the efficiency of the essence of the Urban Environment, ie human interaction.

As a result the form of urban settlements is also changing. A more scattered and yet compact, isolated but also closely knit in communication is the direction that the present age is working on. Cities are becoming interwoven with each other on different levels. With the self contained totally independent urban settlements (consider the walled medieval cities) long becoming a thing of the past, it is now possible to speak of not only regional or local, but global interdependency in the structural network of urban environments.

CHAPTER 4:
THE DIFFERENT SCHOOLS OF THOUGHT

4.1.0 Introduction

Today we protect our cities believing that their growth is complete and that free and uncontrolled influence of technological changes will only destroy them. On the contrary many of us are convinced that the present urban condition represents a confused state and needs insight and desperate design measures to tune it to technological changes.

On the one hand, the City is understood to be a complete creation, a magnificent achievement that needs to be preserved and copied; and on the other hand it is only a result of a utopia, emerging through processes out of control. In other words the City is a result of spontaneous reaction. The urban designer can therefore be seen as a judge in the former case and witness in the latter, in this process.

This section will look at these different understandings, as forwarded by theorists and designers. It will also cover some of the most popular visions for the urban environment, before providing a viewpoint that the discourse promotes.

4.2.0 Classification of theories

Reviewing the views and works of prominent theorists best reflects the perception of the larger society, regarding the discussions of the previous sections. The leading of these theorists, whose works have been influential include Geddes, Wright, Le Corbusier, Sitte, Lynch, Bacon, Rossi, Howard, Jacobs, Alexander, Krier and others.

These theorists display their own views regarding the transforming urban environments. These viewpoints on how an urban environment should look range from nostalgic, to extremely radical. Their understanding however provides us with a means to perceive the changing urban environment. One perspective that unites most theorists

is that they strive to create a theoretical basis for future development based on historical reference. Bobic (1990,p253) uses the discussion of time function in the city space to classify the works of some of the leading authors into the following four categories:

a) Formal-aesthetic

These amplify the importance of tradition. They believe in historical continuity that can be achieved by retaining the line of past tradition. A critical look at this approach will unravel the way in which tradition is simplified and limited into the forms of architecture and urban space.

b) Rationalistic-functionalistic

These endeavor to consolidate processes and methods with the aim of changing society. The point put forward is that the direction of urban life can be controlled through organizational potentials of technological progress.

c) Anthropogenetic

These theories provide concepts that associate the changing urban environment to the historical cause of psycho-social aspects in space.

d) Cultural-communicational

The theory is founded on the organic concept of city products, historical causes and the relationship between the structure and morphogenetic processes.

The discussion of this discourse seeks to focus on more comprehensive groupings. Therefore, based on their philosophical understanding of the urban environment, two broad viewpoints that dispute with each other are highlighted.

4.3.0 The Two Philosophies

One of the earliest controversies regarding the urban life and form was between Sitte and Wagner. " Where Sitte had tried to expand historicism to redeem man from modern technology and utility, Wagner worked in the opposite direction. He wished to roll back historicism in the interests

of the values of consistently national, urban civilization." (Schorske, 1981,p73-74)

These contradicting philosophies, in terms of ways of shaping our urban environment, had existed long before and continue to surface in the present.

Peter Eisenman and Leon Krier once conducted a debate in Chicago. Their argument represents the emotional content (aspects) of the discussions in this discourse, because it touches on the question of universal values, tradition and change. It reflects the intense controversy between two conflicting ideologies. One of which favors Reconstruction and the other, Deconstruction. The argument is concerned with the field of architecture. It does however, reflect the spirit of two different ways of thinking that is in general shared by other professions, as well.

Following, some portion from their debate is presented as it expressively conveys the irreconcilable nature of the two different thoughts covered in this section of the discourse.

Krier: *The fact is that you constantly say that the conditions have changed...now, as far as the American's house is concerned if you drive across the country 99 % of the houses which people think as homes are traditional homes, good traditional homes, brilliant homes, perfect, dreadful, sad. But they are really all traditional homes. Now that is the free market where people are actually free to choose. Why do they choose traditional homes? Because they think that the home, the place to raise the family, is where generally everybody understands as a traditional home. Conditions have not changed in the way you present it.*

Eisenman: *We don't live in homes that are being designed for people today. We need a new type of home: the type form that talks about families that live in two different cities, that have two working people in the family, so that nobody is at home taking care of the children during the day. Such a type form does not exist. A whole different structure of home is necessary and if we continue to build whatever your notion of a home is, and this has changed over centuries as you know, then we will not solve the problems. The form of house has constantly evolved. We as architects have got to propose a new form of home, because the old form of home,*

whether the Palladian villa or the Leon Krier form, don't work any more, for a middle class family without servants.

Krier: *They do work. They maybe comfortable, bad mediocre or brilliant. But they still work and they still correspond to what mo' American people understand as homes. This is not the problem. They are full of innovations.*

Eisenman: *They correspond to nostalgia.*

Krier: *They are of our time. The problem is not for us architects now to propose completely unseen forms of homes which would fit this changing alien condition of people being divorcees, children running away and being punks and so on, but of improving that material which is commonly understood to be 'home'. The problem is not the way the home looks or the way it is organized. That problem is largely solved.*

Krier: *Moreover it (Building) involves the idea of values and the certainty which you have about those ideas.*

Eisenman: *Leon, the question of certainty went out of the window about 40 years ago. that is why you are slamming the table. It upsets you that it's gone.*

Krier: *That's your opinion.*

Eisenman: *It's not an opinion, but a fact. I suggested that there are two aspects of building, their presentness and their survival in history. Presentness can no longer be determined by certainty.*

The argument is hence, endless. The disagreement between these views seems to be deep-rooted in personal 'opinions' rather than theoretical weights. Both viewpoints appear correct in their own terms. Both are also necessary components for the fueling of the general spirit that shapes the development of the human environment.

Referring to Tafuri, Eisenman thus writes: "At any one time in history there is always one architect who is looking forward and one who is looking back. At the time of Alberti and Brunelleschi, Brunelleschi was looking forward and Alberti was looking backward. Alberti introduced the

subject of the classical typology whereas Brunelleschi introduced an invention from science called perspective. If we had not had Brunelleschi, that is somebody looking outside the discourse into what might be possible, we might not have had perspective." (Eisenman, AR 1990)

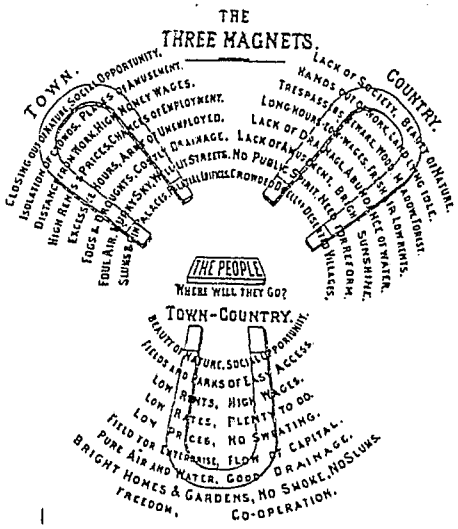
The modern manifestation of these two schools of thought can more appropriately be understood under Empiricism and Rationalism. They have shaped the thoughts of not only designers but also of the larger sphere of professionals on how the urban environment should be organized and how much of it should be affected by technological changes, so that it enhances the quality of life of its inhabitants. Their ideas have been implemented in many places in the world. Although their purest forms are also exercised, these two lines of thought have frequently been intermingled in practice.

Their most recent appearance is in post-modern ideologies like Deconstructivism and Neo-traditionalism. Braodbent in identifying a number of these recent ideas also divides them into: Neo-Empiricism and Neo-Rationalism. Neo-Empirism reflects the thinking of a more picturesque design ideologies of the past. Neo-Rationalism on the other hand is concerned mainly with a well ordered social world and 'an abstract geometric purity'.

Both are thus a continuation of the tradition of the two different schools of thinking in a post-modern age.

4.3.1 Empiricism

Although the understanding of this school is knowledge based on evidence, however in practice the evidence only appears to include aspects of the past experiences. Sometimes this is also referred to as Regressive Utopian, because it, "looks for solutions to the problems resulting from the Industrial Revolution in imagined, idealized pasts rather than in systematic observation of life, human needs, and human values". (Lang, 1994,p46)



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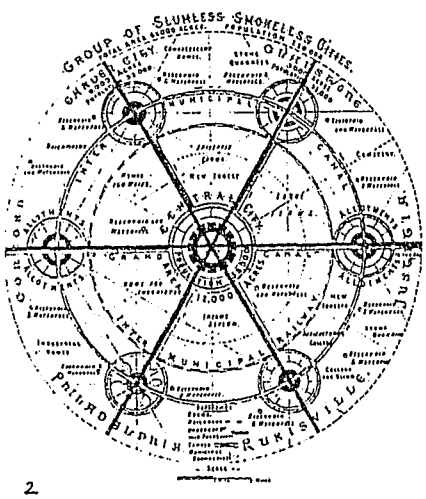

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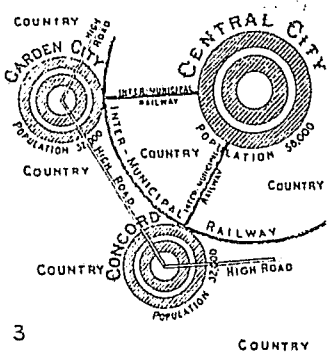

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1 -The three magnets expressing the town-country magnet that the garden city would possess.

2 -Ebenezer Howard's 1898 drawing showing six garden cities and a central city connected by canals and railways.

3 -A diagram showing the growth principle of Garden cities.

The Urbanites:

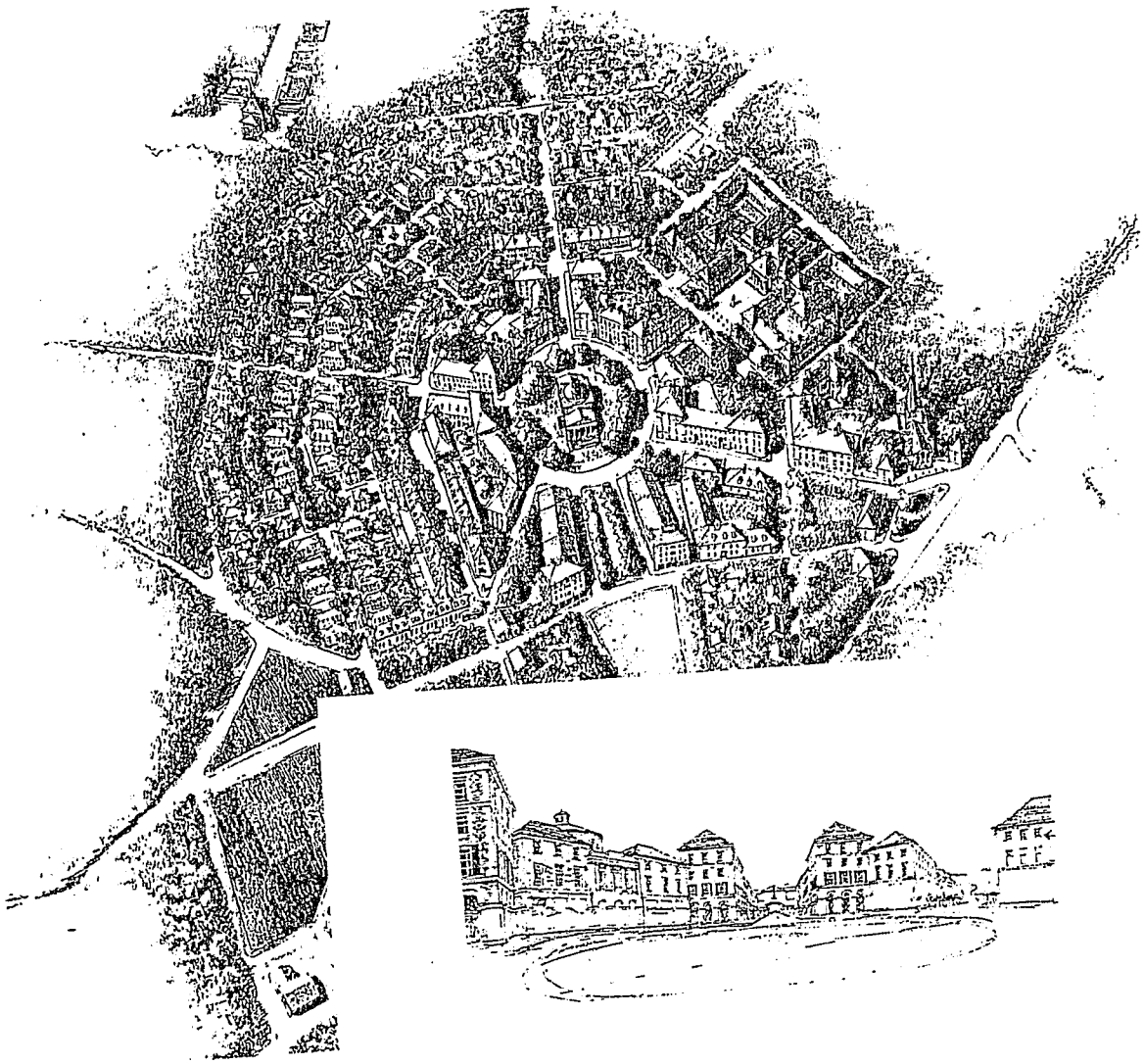
Lang divides the Empiricists into two groups: the Urbanites and the Garden City movement. The concern of the Urbanites is the structuring and detailing of the elements of the urban environment and the experience they offer as one moves through them. The ideal urban environment is based on the aesthetic dimension of the medieval city. The scale and spatial organization of the traditional town is taken as a basic building structure in the shaping and organizing of the urban settlement.

The most recent example of this approach is the New Urbanism Movement as practiced by designers and planners. Duany's work has been among the few examples that have put this theory into practise. In his towns Duany invokes ancient planning principles and depicts classic design images of town design. The design considerations include the use of denser developments and the cluster of houses around a central place that is the focus of civic life. It also de-emphasises the use of automobile, oil and gas stations, banks etc.

The Garden City:

The Garden city on the other hand is a bias of a more Rationalist thinking of the 19th century Empiricism. The ideal model of the urban environment is a small green country town. The Garden City proposes to decentralize cities, reduce their population densities and create more parks and more space for each house. The means to do this has been by, "creating magnets for people, new towns, which afforded the best of country and urban life". (Howard in Lang, 1994, p47)

Thus the Garden Cities of Tomorrow written by Ebenezer Howard proposes a marriage of town and country. The towns would have limited size (not more than 32000 people). They provide industrial areas at the outer ring, green parks at the center and extensive surrounding agricultural lands. When the town reaches its population limit, a new town at some distance will be established until there results a ring of satellite towns around the central city.

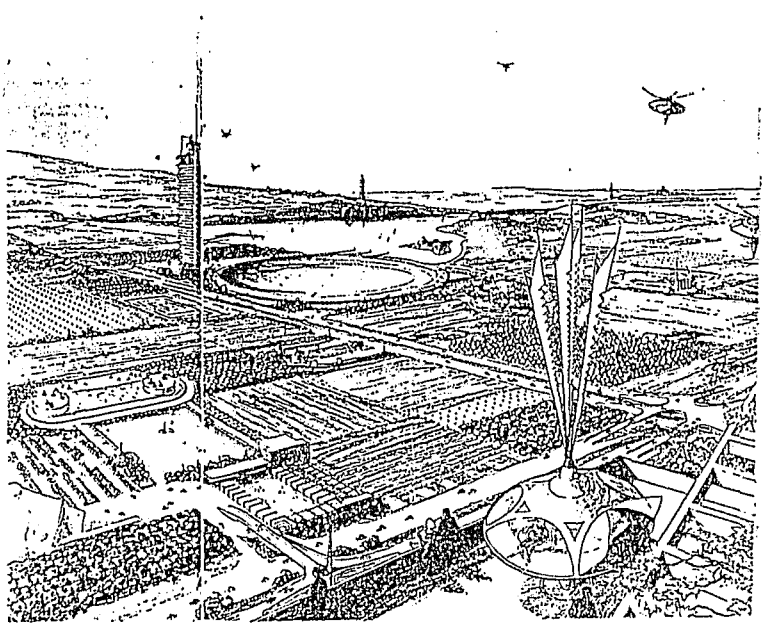


-A design scheme for a settlement near Annapolis, by Duany. Houses are organised around a central civic core, walking through the town is made easier than driving.

Broadacre City:

Wright also proposes the marriage of town and country, in a different approach: Broadacre City. The belief in this approach is that cities are too large as they are and they need to be diffused into a "non-urban" development. The inhabitants of the city would then be self-sufficient farmers and independent businessmen. Wright's city would therefore be laid out on a grid where all families would have their own acre of land. The city would have no central downtown. Markets would be on the roadside.

"Broadacre City is everywhere or nowhere. It is the country itself come alive as a truly great city" (Wright in Mansfield 1990,p50). It is a city whose vision was made possible with the advent of the automobile. Today's advancement in communication and technology probably would have more confirmed for Wright, the applicability of his vision.



-The City diffused into the world: -Wright's impression of the city, as man is liberated by the automobile.

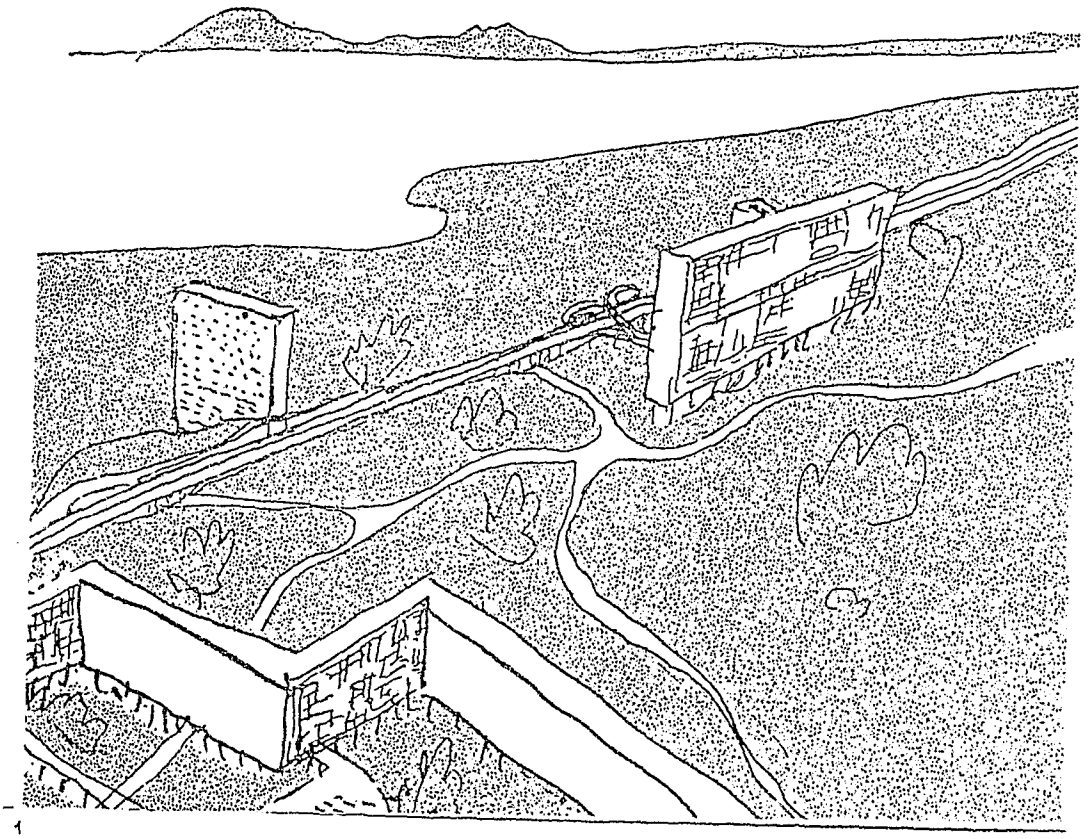
4.3.2 Rationalism

This thinking on the other hand stems from the belief that human reason is the ultimate means for truth. "The Rationalists, from Rene Descartes onward argued for a unity of thinking and a fundamental belief in the facts of existence, without the necessity of confirmation" (Sharp 1978, in Lang 1994,p50). In shaping the urban environment, rationalists therefore relied on coming up with innovative model forms for the present new urban condition. Their ideas still however had precedents although they tend to break from the past in favor of new rational solutions. They confidently responded with, radical approaches to adapt to new ways of life in new technological ages: Thus encouraging large cities, tall buildings etc. Followed by Team 10 and other descendents CIAM has been the major proponent of the Rationalist approach in the Modern era. Of the most influential works based on this philosophy is the Radiant city of Le Corbusier.

The Radiant City:

This approach results out of concern for the nature of cities as Le Corbusier saw them: getting crowded, unhygienic, and inefficient. Thus the Radiant City proposes
-decongested the city centers
-augmented density
-increased means for getting about
-increased parks and open spaces

Le Corbusier saw the street as simply a place for moving cars. Le Corbusier Wrote, "The city that achieves speed achieves success", therefore efficiency in mobility was crucial in the Radiant City.



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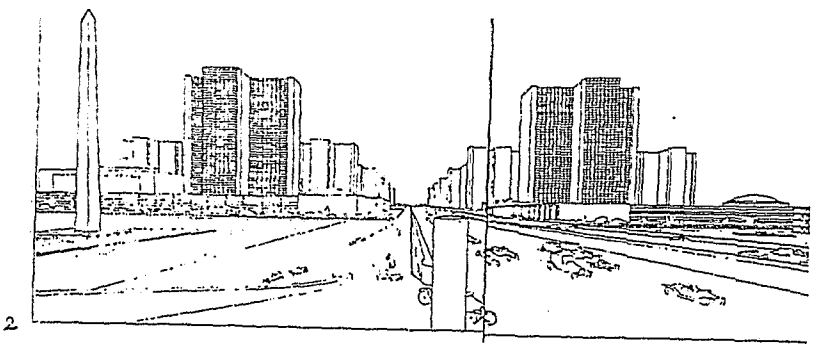

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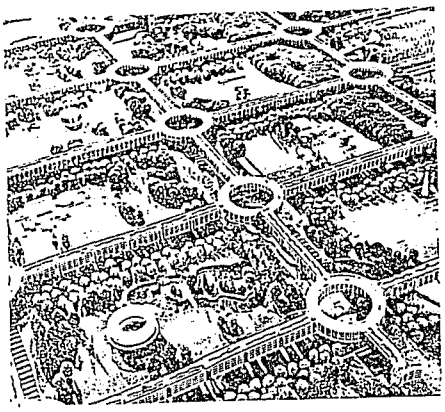
1 -Le Corbusier's idea of a city where buildings finally are freed from the landscape.

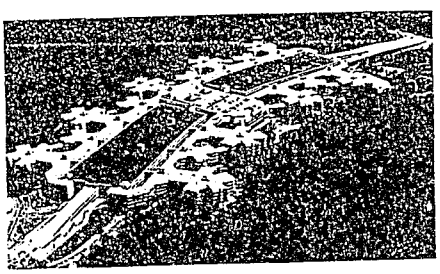
2 -Sketch showing the freeway that forms the gateway leading into the centre of Le Corbusier's Ideal City.

Other Rationalists:

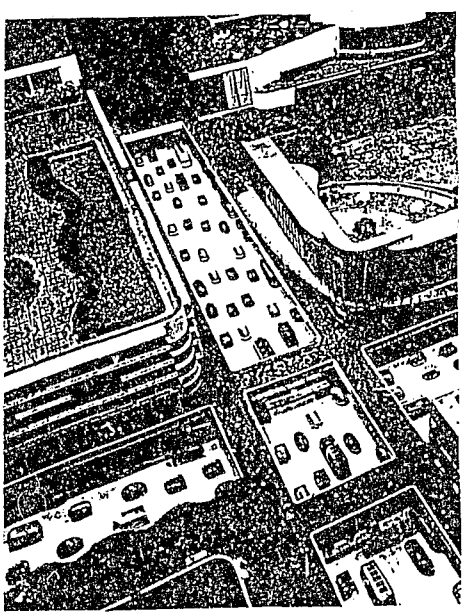


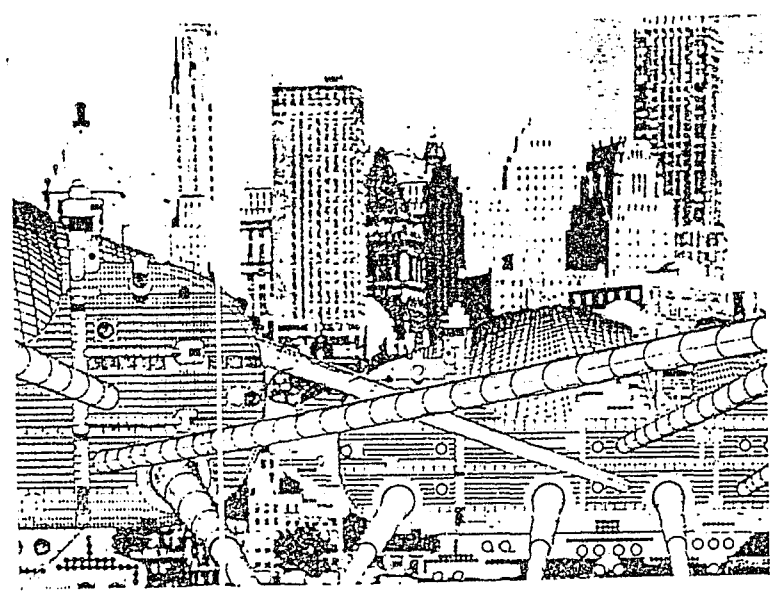
A *number of futuristic images for the city have been developed* throughout history e.g. Megastructure, Roadtown and other futuristic visions.

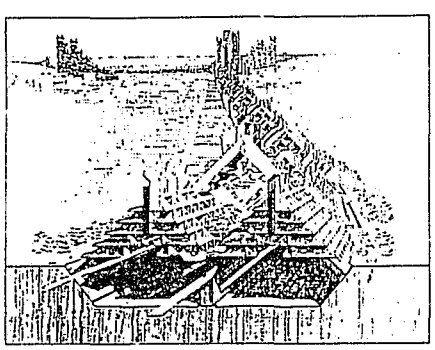
The basic idea in Megastructure is the "city in a building". Although none has been realized, some have become popular because of the impression they create. (E.G. Proposals for Tokyo Bay and the Plug in the city)

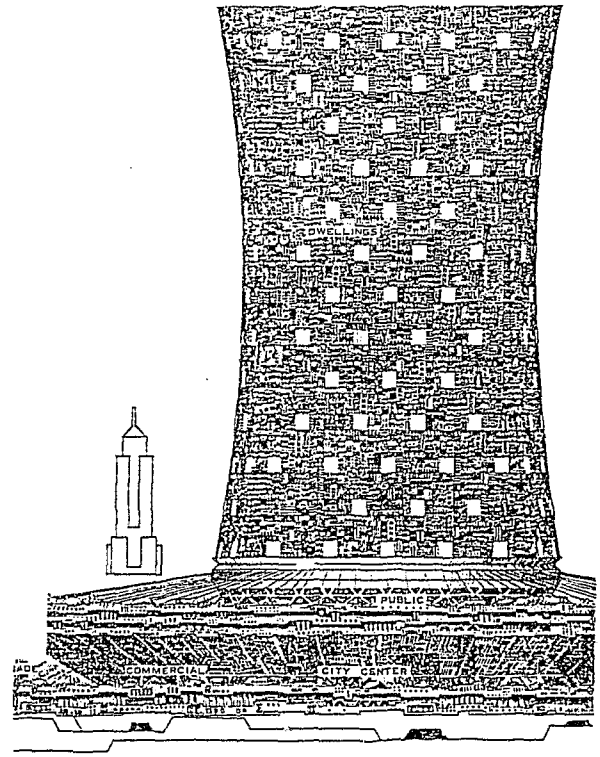


The Roadtown is the horizontal version of the city tower. It proposes to, "...decentralize urban population substituting for present communities of congested city blocks, new communities built in lines, projected out through the country and so arranged that all business industrial, dwelling and other houses will be within one continuous structure". (Edgar Chambless in Mansfield 1990,p107)









MEGASTRUCTURE

4.4.0 Recommendations

The schools of thought discussed earlier are both successful in their own terms. The question therefore is what type of urban environment do we promote? Which is the most appropriate to follow, in the world where technology allows so many options? Do we wish to look backwards and build on the legacy and resources, or do we attract in or surrender to new ideas and let innovation take over?

Today we are aware that breaking from the past, in order to celebrate new ways is not the best approach as attempted by some modern theories. On the contrary, seeking solutions for our present urban conditions in the past traditions wouldn't take us anywhere either.

Lynch suggests, "The best environment for human growth is one in which there are both new stimuli and familiar reassurances, the chance to explore and the ability to return". (Lynch, 1972,p204)

It should therefore be apparent that the problem is no more a question of, which of the approaches previously discussed is right or wrong. The question is however, to what extent should our approaches be traditional and to what extent innovative?

The answer to the above is contained in how we see the urban environment. It depends on whether we see it as a place for comfort (most people are comfortable in environments they are familiar and used to) or for development most. Lang, in explaining the difficulties the urban designer faces in this regard notes that the problem is whether "one deals with changing behaviors, changing technologies, and changing taste of culture, or does one simply design for the known present and allow the future to take care of itself". (Lang 1990 p, 364)

Doshi points out that `there is nothing permanent than the transition itself'. Doshi as a result suggests that in ideal circumstances the spaces that should be created be, "transient, being created only when absolutely necessary, and disappearing when it is not needed". (Doshi 1997, p69) It is a fact that no element is un-affected by transition. There is no culmination of history or no ultimate urban form. But then what type of urban environments will that leave us with.

The viewpoint taken in this discourse is the consensus that the focus should increasingly be on learning from experience and reviewing where appropriate, what already exists. It is about finding the right balance between `Old' and `New'; Past and present, as they both hold the future.

Crane, when identifying the important philosophies for planning processes describes the importance of time function. His points suggest that when shaping the urban environment we must turn away from `opportunistic juggling' and instead focus on, "designing built-in capacity for change, followed by successful adaptations based on change possibilities created". (Crane 1960)

Thus expecting change and leaving enough room for it is crucial. If the two schools of thought explored earlier in this section have

shortcomings, it will be in their tendencies to overlook this understanding.

If change is inevitable, our actions must reflect that. We envision, design and act on the present to the degrees that it does not affect tomorrow's options. Thus Lynch asserts, "It is more rational to control the present, to act for near- future ends and to keep the longer future open, to explore new possibilities, to maintain the ability to respond to change. (Lynch, 1972, p95)

4.5.0 Summary

Generally, two different groups of philosophical understandings regarding the Urban Environment and change have been presented. The equivalent interpretation of these differing views in urban design has been revised by exploring some of the influential theories and works, under empiricism and Rationalism.

It has then been suggested that the approaches stemming from these two different viewpoints are complementary to each other and thus useful to the discipline by providing the required tension.

Lynch's viewpoint that asserts the importance of both; respecting the familiar and exploring new ideas is also stressed as the required direction for an urban design approach.

CHAPTER 5:
THE NOTION OF CHANGE IN THE URBAN ENVIRONMENT

5.1 Introduction

In the development of the Urban Environment, change in the structure takes place continuously. In the process urban structures and form are transformed, destroyed or replaced by new ones. This progressively takes place due to the influence of economic, demographic, political, social, cultural and technological trends, which appear over time. Change, continuously affecting and determining the environment will affect the culture and value system of society.

It is useful to establish a philosophical ground on how to see the transforming urban environment, as attempted in previous sections. It will however also be necessary to understand the nature of transformation. This section therefore discusses the notion of change in particular and in relation to the Urban Environment.

5.2.0 The Nature of Change

The urban environment is affected by a continuous wave of change taking place through time. This urban change can be in the form of growth or decay, or both taking place simultaneously. It could be the result of "...a restoration, an adaptation to new forces, a willed change, an uncontrolled one"(Lynch, 1972:p190). Thus, definitely, it is the result of adaptation to obsolescence and new human demand (Crane).

Apparently two types of change can occur in the Urban Environment based on the pace at which they occur. Vernez-Moudon (1986) in discussing the incremental nature of change refers to change as either gradual `transformations', or as `structural' changes. Transformation to the urban fabric takes place continuously over long period of time. The application follows the availability of resources and arising needs over a course of period It follows peace meal interventions by individuals and families and its effects are not readily visible and or radical.

To the contrary an urban environment could also be exposed to a more radical type of change causing "structural" transformation. This can occur as some type of large scale or more identifiable intervention taking place causing substantial impact on the urban form. Alexander (1979) describes the above same two ideas as `growth and repair' and `large lump developments'. Growth and repair represent the type of change in the urban environment where gradual modifications replace old forms in response to new demands raised by the urban life. The diverse and rich urban environments of the traditional cultures are thus understood to be the result of such change that has taken place over thousands of years.

The other type of change referred to as "large lump" change (Alexander 1979) involves large scale innovations. This usually involves replacement of existing urban structures by newer ones in the form of demolishing and \or rebuilding. Many writers argue that this type of change causes a disruption of the flow of the organic order and 'Cohesiveness' of the urban structure.

However, having taken an observation that includes a holistic view of civilization and its influence on the shape of the Urban Environment, a somewhat different understanding is emphasized. Bobic's (1990) discussion of the following two concepts could be useful at this stage.

5.3.0 Continuity and Discontinuity

The description here is based on the understanding that urban changes develop analogous to natural processes, which imply some aspects of social development. Continuity hence comprises transformations of urban structures due to social and technological developments "... whereby certain urban elements are maintained, added onto and developed over time as urban constants, while others are replaced by transformations or destroyed forever" (Bobic, 1990. p33).

The process thus is expressed in two ways. The first process is through the transformation of the existing urban form and the other includes an addition and expansion of initial structures.

On the other hand discontinuity is required to complete that necessary part of the process whereby a sense of balancing is achieved: balancing the change between urban structure and social and technological development. In other words allowing the urban structure to catch up with changes in other aspects of the social and technological environment.

However the concept of discontinuity, will only be expressed as a non-existent phenomenon if used to literally mean disruption of a continuous city building process.

As outlined in chapter two, the city is a collective work, objectifying reality. It is a manifestation of the human record of reality. Therefore "...we cannot speak of the discontinuity of development of the city totality within the context of history"(Bobic1990, p34)

What would be taken, as a disruption of flow of organic order and thus discontinuity, at a scale of urban elements could still simultaneously be a continuous activity, at the level of city space. Discontinuity is actually a necessary process in that it reflects the system's equilibrium. As a process, discontinuity has the meaning of continuous development. Therefore the understanding should be there that it is not a process that we need to reject or avoid.

5.3.0 Processes of Change

The Urban Environment is a live, changing thing. A number of external and internal forces exert pressures that transform the physical environment. Through the course of history, the urban structure has been shaped under the influence of movement, population size, and the progressive development of functional processes. On the other hand, nature and flow of human evolution and the history of the city's development comprise a permanent interaction between people and their environment. People continually attempting to meet their needs through the stages of their social development interact with their environment. The urban form will thus keep transforming as a function of maintaining a dynamic equilibrium in human activities and their interactions. Bobic, in

analyzing the princip · , which the urban structures exist and transform elaborates on the following three characteristics on which origin and existence of the Urban Environment is based: totality, transformation and autoregulation.

Totality is expressed in the spatial and non-spatial determinants of the Urban Environment. Change caused in this aspect will affect the qualitative and quantitative characteristics of elements. The influence of external factors causes the movement of elements and causes internal and external equilibrium. The transformation of the urban structure will consequently occur when autoregulation takes place as a result of the internal effects of equilibrium. This will be the point where urban elements change their properties and position.

Another perspective on the nature of the process of change in urban environments is that it usually takes place in a more arbitrary way because of the complexity of the parties involved. It occurs without our action toward a pre-determined goal. Lynch (1972) in this regard suggests that we are constantly reacting to forces that are beyond our control in order to establish a desired level of achievement. Adaptation aims to maintain some level of performance in terms of "...income, comfort, safety, adequacy, speed, purity, biological health, delight visual or social character."(Lynch, 1992, p200). Besides adaptation does not only seek to prevent irreversible change but provides a control mechanism against an excessive rate of change.

Trancik (1986,p230) also points out the fact that cities are the product of a process of change through a course of time as a result of a multitude of both public and private decisions. When elaborating on some of the types of groups involved Lynch (1989,p40) mentions that they include political, social economic, environmental, legal and physical forces. "Cities are built and maintained by hosts of agents: Families, industrial forms, city bureaus, developers, investors, regulating and subsidizing agencies, utility companies and the like. Each has its own interests and the process of decision · agmented, plural and marked by bargaining. Some of these agents are dominant, leading, others will follow those leaders."

Therefore in such a continuous and complex process of city building, the concept of an ideal final urban fabric is out of question. The process is

only a continuous change resulting in a succession of phases. The rate of change is not possible to determine, as it is a factor that incorporates many forces that are at play. Lynch (1972) observes this fact and points out the difficulty in identifying an optimum rate of change. Often when change takes place too rapidly it is found to create resistance in society resulting in societal conflict, in the larger groups of society, which are involved.

5.4.0 Values

The concept of value is imperative to the understanding of forces that shape the physical forms of cities. Humans are continuously involved in decision making with regard to their environment. Their decisions are highly dependent upon the set of values that their society ascribes to. Lynch points out that 'values and explanations' of how city forms should be are inextricable. The values that a society might share manifest themselves in the activities, which individuals and groups engage in, hence, "...settlement form is the spatial arrangement of persons doing things, the resultant spatial flours of persons, goods, information, and the physical features which modify space in some way significant to those actions." (Lynch1981, p48). Lynch thus makes the connection between human values, human actions and the physical urban structure. He recognizes that values and form are interdependent, and together they form the context for society and the phenomenon of human action, which intervenes to change either values or physical form in order to meet its needs.

As an individual, the values that one holds could be a product of a number of factors. Values are not inherited phenomena and are only determined by the socio-cultural context. They are liable to changes in the processes of growth with social processes. In fact, the social processes that determine them are inseparable from the physical environment. Therefore, Kostof (1991,p9-10) suggests, "The more we know about cultures, about the structures of society in various periods of history in different parts of the world, the better we are able to read their physical environment."

Mills(1967), puts forward the idea of "cultural apparatus" in explaining the determinants of the value system of the contemporary society (p 405): An apparatus that will intervene in an interpretation and valuing of the surrounding. Therefore, "The only truths are those defined by some cultural apparatus. The only beauty is the objects created or indicated by some set of cultural workmen. The only good is the variety of cultural values with which men are made morally comfortable or morally uneasy" (1967,p407)

In conclusion therefore it suffices to say, if the value system of society is a function of determinants like the `cultural apparatus', then this should confirm once again that there are few absolute values on the planet. There is almost no universal value that transcends time and space because the 'cultural apparatus' itself is defined by the non-absolute force of the social, economic, technological and so on developments in an environment.

5.5.0 Some Viewpoints of Theorists

The following theorists' perspectives on change are highlighted in terms of their relevance to the discussion.

Lynch

Lynch (1972) argues that change and recurrence are the sense of being alive. He, in addition proposes the belief that we need to retain a reasonably open future .In doing so Lynch (1972) proposes the following points:

-Conservation provides continuity of community and a means of conveying a sense of history.
-Adaptability is useful in preparation of the present for the foreseeable future.
-Prototypes allow for the creation of a reasonable and feasible future at present by exploring possibilities that are genuinely new.

Crane

For, Crane change does not simply mean replacement. It is the evolution of existing life forms to suit totally new purposes. Making the distinguishing between the activities and structures of urban life (order and form), Crane notes, "Order changes are causes of form change". And thus Crane stresses the fact that in the present, change in the urban form is occurring faster than ever before.

Crane discusses the Dynamic City, which is derived from three `basic truths' about the contemporary city:

-Rapid acceleration of change in city life forms and unequal physical process

-interdependence of life and structures over great space-time scales of change distribution

-complexity, multiplicity and power of the City of Thousands Designers

Crane thereby, calls for the recognition of a philosophy of hierarchical change in permanence. "...City form should contain successive layers and scales of parts where change and stability seduce and sweeten each other. Each step of the city-making process should produce more specialization" (Crane, 1960)

Trancik

Trancik also recognizes the dynamic approach to incorporating change and innovation into an environment. His suggestion to achieve this is by addition. Small scale change in the urban environment assists in integrating new elements with the old and avoids the demolition of entire sections of the urban fabric which happens with total development. Greater variety, richness and vitality can be incorporated with gradual changes to urban fabric, and greater degrees of continuity of built form and with history can be achieved. (Trancik 1986 p.219)

Rossi

Rossi emphasizes the importance of the past in order to have the future. The past is with us and is being revealed now to some extent, through monuments, which are the `physical signs' of the past. Nevertheless he asserts that the dynamic quality of the city tends more to evolution than

preservation. Monuments in this evolution are not preserved, but continuously presented as propelling elements of the future.

5.6.0 Spatial Implications

As the urban environment progresses changing through time, its spatial structure attains new design characteristics and aesthetic features with newer functional demands. The form of the spatial structure as a result transforms gradually developing symbolic functions and form.

While the open urban space is understood to consist of four functions: productive, protective, decorative and recreational. (Tunard & Pushkarev, in Bobic1963) Other theorists have referred to these functions as usability, visual and feeling. These are not functions, which can be dismantled. They collectively contribute to the urban environment as a pleasant place to reside. The basic reason for transformation in the form of space under the influence of changes in the functions takes place in accordance with the development of technical means.

In order to attain a closer look at the subject of change in the form of the space and structures of the urban environment, The latter is analyzed in terms of its three generalized components: the block, the street, and the square. The following observation of these elements should indicate the transformation of the urban structure due to imposed social functions under the influence of technological changes.

5.6.1 The Block

As a result of the influence of technical and functional demands, change in form is more explicitly and dynamically expressed by individual buildings than by the spatial structure of the city. Due to the fact that individual requirements are more apparent here different types of buildings, the forms of their functions and the application of technical means create different structures of the city. An observation of the development of forms and structures of the city block from the 19th century on indicates the way in which the hygienic, economic and social conditions were changed. This change was due to the influence of technological building systems and the demands of motorized traffic into

forms of lower socio-psychological values and thereafter returned to original forms in an attempt to recapture lost features. The block accepted new influences with time, which were reflected as follows:

-Change from the geometrical shape for example from a free to a regular shape.
-The dimensions of the sides increasing with the scale of the traffic.
-The use of uniform plots, eliminating special activities.

5.6.2 The Street

The street is a 'social tie', visual and information corridor of the urban structures. The form and the function of the street are inextricably linked. The transformation of the street is realized under the influence of new functions and the change in the form of existing functions. The complexity of the street's function therefore increases with the increasing growth in the city's complexity. This is why the street over time has acquired a form that enables the better flow of people, vehicles and goods.
"The endeavor to overcome spatial distances in as short a time as possible influenced the formation of symmetrical networks and the elimination of rich traditional typologies."(Cullen, 1991 in Bobic 1990,p230)

Therefore, the following characteristics of the street are affected with the arising functional needs.
-The width, which increases with the need for greater capacity.
-Shape of lines of street, to link points by the shortest distance.
-The depth of the corridor, by increasing the height of buildings.
-Usability, with increasing density and continuation of structures in the corridor.

5.6.3 The Square

If the Street serves to link points in space then its purpose is only complete with the aid of squares. The square joins different streets, and appears at changes in directions, in front of important buildings, and ceremonial places. It is a dynamic location where the confrontation of numerous city functions is expressed. Therefore the square does follow and adapt to the function posed by the social order of a certain technological demand. Through history, it was with these technological needs that the very concept of the square continued to transform. In the

medieval times it has been a location of extremely dynamic markets and meeting places. Most eastern countries used squares as a place reserved for communications, parades and demonstrations. In the present world where urban space worships the motor car, we see squares celebrating the mere intersection of traffic junctions. The following list consists of ways in which the square accepts new influences in space and arranges the structure:

-Construction on the edge of the square as it gets denser and continuous structures.

-The alteration of the squares surface by the introduction of new contents.

-The increases in the height of the square edge to express the importance of the location and on the activity.

-The weakening of the enclosed effect of the square by penetrating it with wide streets.

-The force of the square being determined by the arising geometrical shape due to traffic flows and land plots.

5.7.0 Summary

All in all, the chapter has considered the nature of change, the processes and implications in relation to the built urban environment. As a result of the discussion the following points emerge.

City building is a continuous process involving destruction, building and rebuilding. As a result the total environment will keep transforming into an undetermined future. This transformation cannot be seen in any way different from the social transformation, which is taking place influenced by technological changes. On the other hand values that the society hold are also affected with these changes in the urban environment. Hence an element of foresightedness into the emerging urban environment is necessary. A method to "retain a reasonably open future" (Lynch 1972) Should be incorporated to any endeavor that deals with the Urban Environment.

CHAPTER 6:
SHAPING THE CHANGING URBAN ENVIRONMENT

6.1.0 Introduction

It has been discussed that a number of significant forces in play influence change in the urban environment. These forces will determine the shape, size and quality of the settlement. This section will concentrate on the theories related to the shaping, and ordering of the urban environment. Structure, as a main former of the physical shape and quality, is elaborated upon. In order to grasp an understanding of structuring concepts, elements and properties which form the basic building blocks for urban designers as they intervene through design action in the shaping of the urban environment are identified.

6.2.0 Forces at play

Practically, no list of number forces that shape the urban environment can be complete. Gottman (in Chapman 1996) suggests that the influential ones include demographic, economic, cultural and technological forces.

As the core of the discussion of this discourse, it has been suggested that technology plays the most significant role in accelerating the forces that shape the urban environment. As outlined in previous sections the understanding has been that any development in technology is reflected in the cultural, economic, political and other aspects of human realities, that will also on their own contribute in shaping the urban environment.

Lang (1994) explains the factors in play as a dual phenomenon. It is the interaction between Biogenic and Sociogenic environments that is responsible for shaping and giving character to the urban environment. While the Sociogenic environment is responsible for human social development, It is Biogenic environment which provides the setting or physical frame for human life. It consists of the physical structure of earth, its atmosphere and the changes that takes place in them due to natural

events. Technology's role will be in that it comes in to help to overcome many of the restrictions the Biogenic world places on the urban environment.

The resulting shape of the physical urban environment can thus be explained as a function of the degree to which humans respond to the realities of their environment. The pattern will be determined by the incremental contribution of the players, and how they sought to adapt to their rapidly changing environments.

6.3.0 Structuring

Structuring is central to the shaping of the urban environment. As Dewar et al points out, "Structuring not only informs how the settlement grows but also how well it performs: how well it accommodates human activity and life."(Dewar et al 1990,p 15)

Throughout history, structuring has occurred in different forms as a result of the degree of technological developments available to that particular settlement. In different attempts to analyze the physical urban environment, theorists have tried to study the urban structure in a number of ways (planned \unplanned, ville creee\ville spontanee)

Christopher Alexander (1964) elaborates on the two types of design processes that influence the structuring of the urban environment as: unselfconscious and self-conscious. Unselfconscious design, in the purist sense, is typical of societies which have a low division of labor, few types of buildings and a limited range of materials and techniques for building. People are able to design for themselves. The design process however is pre-programmed. Rules are utilized in the siting and construction of buildings. These rules are not recorded in writing but are recorded in people's minds and their traditional practices. Broadbent (1993) has called this process of design Pragmatic design. Pragmatic design has evolved over a long time. It responds to the problems those groups of people faced. The nature of solutions change slowly in response to the delayed changes.

Self-conscious design processes result from decision making before acting. They occur in societies which have a high division of labor and involves people who specialize in designing for others. Division of labor arises from the technological and social aspects of modern society.

Dewar et al (1995), in a similar light distinguishes between two approaches: Programmatic and Non-programmatic. The former relies on the conscious creation of strong geometry. It focuses on the "...assembly of pre-identified elements of settlements (roads, houses, shops, churches and mosques and so on), each of which has its own space requirements."(Dewar et al 1995, p16)

The non-programmatic on the other hand is organic and gives less direct direction and is more reactive. It is not based on the issues of efficiency of the parts, but is concerned with the quality of the whole. It is, "... informed by how people over time have addressed the making of place in order to meet their human needs, to celebrate life, to acknowledge the importance of the institution they value, and to give dignity to people and their activities." (Dewar et al 1995, p16)

Although both have advantages and disadvantages, they are useful and complimentary to each other. The goal is to seek an appropriate approach that accommodates the rapid change in the urban environment.

In this instance although both structural approaches could and should still be adopted, the Non-programmatic particularly is credited for blending change in the urban environment in a natural way. This approach can therefore be promoted to become more incorporated into urban design processes, to be able to shape better urban environments that are sensitive to the changing human needs.

6.4.0 Concepts for Structuring the Urban Environment

All available design theories for structuring the urban environment are guided by their promoters' own image of what a good city should look like.

Each promotes model ideas based on different value systems. The result is differences in urban design objectives.

They begin in different ways of decomposing the urban environment into its elements. Although not always in agreement, they are not necessarily in conflict with each other. It only reflects the way some theories encourage certain environmental qualities and how to promote it differently from others. They therefore focus on different elements of the spatial and physical structure of the environment. A review of some of the available urban design theories concerned with structuring the urban elements is discussed before highlighting on the performance qualities to be met.

Gerbauer and Samuels (1981), in locating Urban Morphology as the basis for a theory of Urban Design highlight the importance of an understanding of the city as the physical environment which is the expression of values of society through time. The built environment gives meaning to the city in reflecting societal values. Accordingly the basic physical components that form the urban environment are the 'built form' and the 'open space'. While the built form is understood to be the mediator between private and public spaces, and constitute the fills, the public open spaces are make up the: Public space that consists of streets, squares and green areas; and private space that consists of plots and blocks. It is the relationship between these components that forms the structure of the urban environment and thus the existence of a societal value system that is expressed in a logical organization and dynamic process of transformation and change.

The physical elements of the urban structure as Chapman (1996) identifies them, can be described with a range of scales. At the bigger scale is the regional framework, which is determined by the surrounding mountains and river valley. They constitute the natural elements and regional roads that connect towns.

The structure at the level of scale of the town include:

-a grid of blocks
-an organization of public and institutional buildings and spaces
-close grained urban fabric
-natural elements such as trees and rivers, and etc.

And at the lower levels, the structure includes:

-public and private buildings ,
-system of lanes, paths and squares
-low walls, arcades, planting, and similars.

For Krier, the urban environment is basically the product of urban spaces, in the form of streets, squares and other open spaces. Krier's study demonstrated an exhaustive typology of spaces that recognizes the interrelationships between streets as one form of space and open spaces in the form of squares, courtyards, market places, piazzas and plazas, and the buildings, their sections and facades (Krier in Broadbent1990).

In analyzing the primary design concern for the urban designer, Denis Scott Brown (1990), on the other hand claims that the design components of the public realm constitute the streets, public and civic buildings, and parks and open spaces. These form the basic elements, which give physical expression to the needs of society, although they differ from area to area and change with time.

A somewhat different analysis is provided by Lynch. Lynch's study emphasizes more on design for ease of orientation. The elements identified are those that can display and make the urban environment legible for people. These images forming proprieties are described as nodes, edges, landmarks, paths and districts. It is in manipulating these elements that visual organization of the urban environment serves to provide identify, structure and achieve meaning.

There are hence a number of ways of looking at the urban environment. It is not practically possible to list the elements that form the structure. Conceptually, the concern is with the surfaces and objects of the environment, the materials of which they are constructed, the way in which they are illuminated, and their pigments (Gerosa1979, in Lang1994).

In analyzing the theories of urban space design Trancik distinguishes between three different approaches: Figure ground, Linkage, and Place theories.

-Figure ground theory provides the relationships between building mass and open spaces or urban solids or urban voids as the basis for an understanding of th urban from. These relationships are taken as crucial for establishing the character and physical continuity of the urban environment.

-Linkage theory emphasizes on connection and movement by articulating circulation as the generator of urban from. As Maki's three types of spatial linkage (compositional, group form, mega form) demonstrate, linkage is assumed to be the prime glue to the city.

-Place theory includes in its recognition the importance of historic, cultural and social values in context. The urban environment is understood to be meaningful if it promotes the creation of 'Place', by attaching contextual meaning to space.

6.5.0 Meeting needs

The approaches discussed have all their own merits. They will be useful for an understanding of the physical urban environment in its different form. Important at this stage is to promote an approach that draws on all three as Trancik proposes. "...Giving structure to the solids and voids, organizing the links between parts, and responding to the human needs and unique elements of the particular environment." (Trancik1986, p98)

The physical structure of the urban environment should be designed in accordance to these requirements. In addition emphasis should be given to tomorrow's needs. This will require an understanding of the elements of the urban environment beyond their `city essential role'. Crane (1960) suggests that this should include a responsibility to "...exalting the human condition and defining tomorrow's necessities".

Based on these discussions, the following criteria are forwarded that a `good' urban environment should meet.

6.5.1 Meeting transforming needs:

It is true that urban design endeavors have considered the following conditions:

-Building lasting longer while uses change (Olympic Villages)
-Both the built environment and uses changing (World fairs)
-Elements of the built environment responding to changing ideas (Amusement Parks)

Apart from few instances however in most urban design interventions the assumption appears to be that the built environment or the conditions for it will last long enough.

In several stages, it has been pointed out that Change is a crucial phenomenon; and thus that the structure of urban environments must reflect this. The example of the ideology assumed by Manson (Studio by Doshi and Kathpalia) proposes temporary and intangible complexes using tent-like structures. It is based on providing temporary spaces in the structure of the urban environment that will be removed with changing needs. It is questionable whether this should give ultimate concept for shaping the urban environment ,whose main role has been to transform learnt technology to the next generation. Besides, as Krier has remarked, "Desert nomads are not famous for their creative contribution to the land" (Krier1960). The plug-in city concept in a similar light is developed with the assumption that change in cities would be rapid. The basic infrastructure set in place, the idea assumes that most needs are pre-fixed. Providing this as a national solution, the concept shows a pre-conceived idea of possible arising needs, hence leaving no room for new changes to be accommodated.

The answer should lie in seeking a form and structure for an urban environment that reflects less permanence continually revised with social interaction. "City form should contain successive layers and scales of parts where change and stability seduce and sweeten each other. Each step of the city-making process should produce more specialization" (Crane1960, p162).

Crane's Dynamic City idea with the philosophy of 'hierarchical change in permanence" thus, have incorporated the principles that a changing urban environment would require.

6.5.2 Meeting functional needs:

One of the most legible properties of the Urban Environment is its functional (utilitarian) dimension. It is about providing facilities and choices for users who choose to participate in, whether as a group or alone. The ease in which inhabitants are able to access these facilities and how pleasant the experience is determines how successful the urban environment is. A properly managed hierarchical use of spaces, from most private to most public, without infringing on the other needs of inhabitants is important. This must be supported by efficient movement structure of the city.

Addressing this dimension will be a complex task involving scientific exercise of deciding between the possibly competing needs of elements such as industry, retail, business, Residence, transport and leisure.

6.5.3 Meeting psychological needs:

Human psychological comfort highly depends on the degree of familiarity of the environment. Many people do not tolerate anything new even if it is for their benefit. They prefer to seek comfort or 'hide' in a more familiar environment. Others on the other hand seek change, and challenging situations for growth. Although stressful to a certain degree, new situations and experiences lead to physiological and intellectual development.

Urban environments that demonstrate high degrees of any of such situations will not be comfortable. The challenge for the urban designer therefore lies in maintaining a balance in the environment to allow and contain both qualities.

6.5.4 Meeting social needs:

Humans have frequently been described as social animals. They develop culture to communicate with each other and interpret their activities. This dimension is no where better expressed than in their physical environments. Sitting outside a pub watching the world go by, going for a walk, chatting to neighbors, are all integral to social and cultural life. One of the most important elements of the city that supports culture is the urban space in which these activities take place. The street for example can be used to generate vitality by bringing together a mix of different uses. Montgomery, condemning the sterile environments created by making cities excessively 'neat and tidy' describes that, "a city is messy, it has fuzzy edges and overlaps of place".

For creating such livable environments (and meeting social needs) it will be important to explore the character that gives an urban area its unique sense of place or identity.

6.6.0 Summary

Shaping the changing urban environment is a complex process. It involves innumerable number of forces in play over an endless period of time.

It has been discussed that the process involves structuring the urban elements in direct and/or indirect interactions. It has also been noted that how we structure them depends on how we see the urban environment. Different theorists have forwarded somewhat different priorities on haw to understand these structural properties. Thus some of the most popular structuring concepts have been elaborated on. An approach that draws on the important aspects of Figure-ground, Linkage and Place theories is then recognized. Finally, it is suggested that such concepts should be employed to meet criteria for the Urban Environment discussed.

CHAPTER 7:
THE ROLE OF URBAN DESIGN

7.1.0 Introduction

Increasing specialization of the existing professions, in creating gaps in between them failed to meet the increasingly complex needs of the urban environment. As a result when urban design emerged as a profession some thirty years ago, its main reason was to `fill this design vacuum' that the existing fields left in between.

Therefore, it is suggested that the goal of urban design is, "to strive for a quality of physical urban environment which nurtures human dignity and culture through design, based on an understanding of the social, economic, physical, temporal, political and legal processes that influence the structure and form of cities." (Senior and Wood 1987).

If technology has definitive influence on social, economic, physical and legal processes, then the role of urban design in a rapid technclogically changing environment will be critical. In the previous sections the qualities of a 'good urban environment' and what one should strive to negotiate has been outlined. This section will thus consider the role of urban design in achieving these urban environments.

7.2.0 Defining a role

As has been discussed, the urban environment it continually subjected to waves of change influenced by technological forces. It is important for urban design to consider the emerging trends, respond to new demands arise, provide meaningful form, and manage the process of change (Worthington1995). In so doing urban design will need to reflect the past, be sensitive to the future trends, and act as a moderator of change.

Broadly defined, urban design therefore has a role that requires a holistic understanding of realities and vision that unifies the changing trends, to give direction to the form of the urban environment.

7.3.0 urban design practice

Lang (1994) describes two groups of urban designers: visionaries and practitioners. Although the difference between these categories is blurred, Visionaries are more involved with designing their own worlds. They are primarily interested in the creation of new social, spatial and architectural orders. Practitioners, in contrast, are concerned with a more practical world. Their concern is with day to day problems of design, which exist in socio-political problems. Practitioners tend to emphasis an incremental approach.

Some professionals tend to dismiss visionaries as `stary-eyed dreamers in ivory towers', and visionaries on the other hand, are critical of piecemeal approaches and lack of vision of the practitioners. (Buder1990 in Lang1994)

Indisputably however the practice of urban design requires some degree of vision and an insight that requires seeing beyond the immediate day to day problems in order to give rise to more holistic solutions. Urban design should also importantly include a process, which is balanced and continually checked against the realistic constraints of time, social and financial contexts.

Both the visionaries and practitioners perspectives are therefore useful and complementary. They are useful so long as the tensions between them build the polarization required to create equilibrium for a successful performance of urban design.

7.4.0 Urban design framework

The main aim of urban design is not only to produce beautiful pictures of the urban environments but to create a comprehensive framework through innovative design. This approach will provide a background for decisions and actions through a period of time. An urban design framework will therefore be useful to provide a reasonably clear direction for existing and future growth. In doing so the urban design framework will need to indicate the location and principles of various land uses and activities, movement systems and types of buildings. In addition, the urban design framework will indicate the capital structure (Web) of public facilities, and necessary design controls. One of the important aspects of the framework is the implementation strategy. The implementation strategy will indicate the public action required to elicit a response from the private developer (Senior and Wood1987). It is through the use of such frameworks that an urban design intervention will ensure the meeting of the concerns of urban design.

In order to elaborate on the role of urban design the following set of principles, that an urban design framework should enable, are highlighted.

7.4.1 Outline a realistic vision:

"A vision without a task is but a dream
a task without a vision is drudgery
a vision with a task is the hope of the world." (Anon in MDF 1996)

Any successful urban design intervention has to be traced on a practical vision (7.3.0). It would certainly not be possible to predict the changing priorities over a period of time to prescribe a detailed form for the development of a city. But based on the global and immediate contextual understanding of the present and future directions it is useful to envision a target destiny to the development of urban environment. A responsible urban design exercise would include the views of the community at this stage for an intelligent interpretation of the environment and its promoted destiny.

7.4.2 Adopt a process oriented approach:

Formulation of a holistic vision at any given time should not entirely dictate the building of a complete city. The urban environment is made by a series of decisions and actions taken in a long process. That is, while broad parameters of future city form and structure may be defined to direct incremental decisions and actions, the definition of an 'end-state' for any point in the city's evolution is a utopian dream and a denial of city dynamics. It is possibly more correct to see city-building as an environment in `a process of becoming' rather than the delivery of some final product (Senior and Wood1987). This will recognize the close ties between the form of the urban environment and the social needs, values, activity etc, which are continually being revised by technological developments.

The urban designer's role at any given time will be to ensure that the physical form which results from the processes matches these social needs, values and activities of inhabitants.

7.4.3 Promote environmental quality:

Although not exclusively, urban design is primarily concerned with the quality of the public environment, the buildings and the spaces between them.

It is therefore important that the positioning of the buildings in the urban fabric, their relationship to one another, their scales and the quality of the spaces that are created in the process are given attentive care. Doing so requires defining the `essentials and the non-essentials' in the complex urban environment and processes evolved in shaping it. It will be necessary to establish the elements and their role at different scales in the urban hierarchy. This will allow a clear frame of reference to be established for determining what needs to be designed and what needs to be untouched.

7.4.4 Recognize the dynamic nature of environments:

It has been suggested that the dynamic qualities of the urban environment demand a physical form that is responsive to conditions that are not expected. The simplest way to achieve this would be by leaving the land untouched.

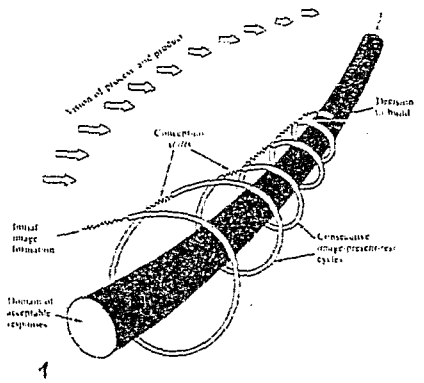
On the other hand as urban growth is a continuos process, the environment should still resemble a complete urban state at any given time in its development. Urban design must thus create a unity between the needs of the present components and the needs of the timeless whole, through an understanding of the organic and dynamic nature of the urban growth. In doing so urban design must seek to strike a balance between elements of rigor, which structure the environment, and of flexibility which stimulate and surprise as the city grows through time. (Senior and Wood1987)

This will call the incorporation of 'Resilience' in urban design. Resilience balances continuity and change, and permits space to assume a variety of functions and meanings, and to be owned and inhabited in a variety of ways without requiring major modification. (Vernez-Moudon1986)

7.5.0 Urban Design Process

Urban design is concerned with both the product and the process. Therefore the attention of the urban design process is as important as the final result, i.e. the shape of the urban environment. In order to elaborate on the role of urban design in this regard, concepts on some of the planning, and design procedural theories have been drawn on.

Many of the useful design processes noted include characteristics such as imaging, presenting and testing. Zeisel (1981) has provided one of the most accurate descriptions of such a design process. In addition Rittel's



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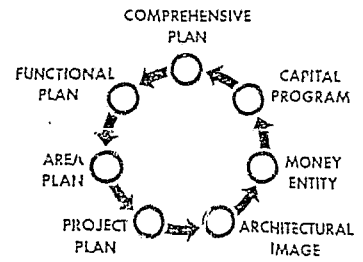

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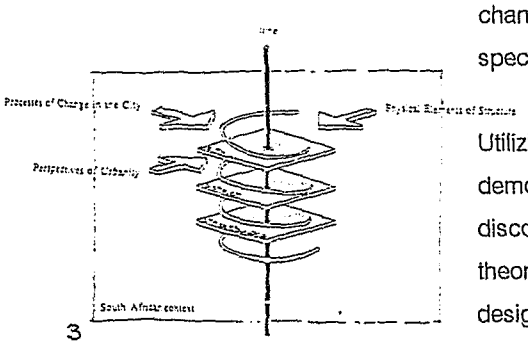


3

URBAN DESIGN PROCESS
MODELS: 1. ZEISEL,
2. BACON, 3. MARKEWICZ

BELOW: URBAN DESIGN PROCESS
MODEL INTERPRETED FOR CONTEXT.

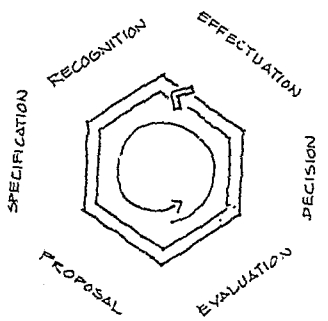
concept of design as a 'wicked problem solving activity' demonstrates the further dimension of the design process.

A comprehensive model for urban design process is that provided by Wolfe and Shinn. It is, "...the best available on account of its thoroughness, its insistence that the public be involved and its recognition of the difference between inadvertent and deliberate design." (Boden1989, p53)

In suggesting an urban design process for change in the South African City, Markewicz (1992) provided a model that incorporates the cylindrical design process of Zeisel (1981), the planning process of Bacon (1976) and the "thinking machine" developed by Dewar et al (1978).

This model reasonably indicates the integration between urban form changes, urban performances and the physical environment. It is however specific, and does not elaborate on the design characteristics involved.

Utilizing the ideas discussed, an illustration is thus provided (fig Y) to demonstrate the processes of urban design in the context of the discourse. The attempt is, while recognizing the design procedural theories provided; it is to further emphasize the nature of change in the design environment.



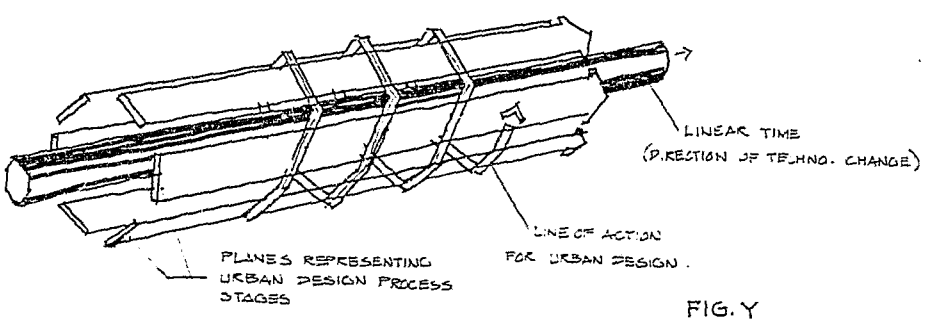
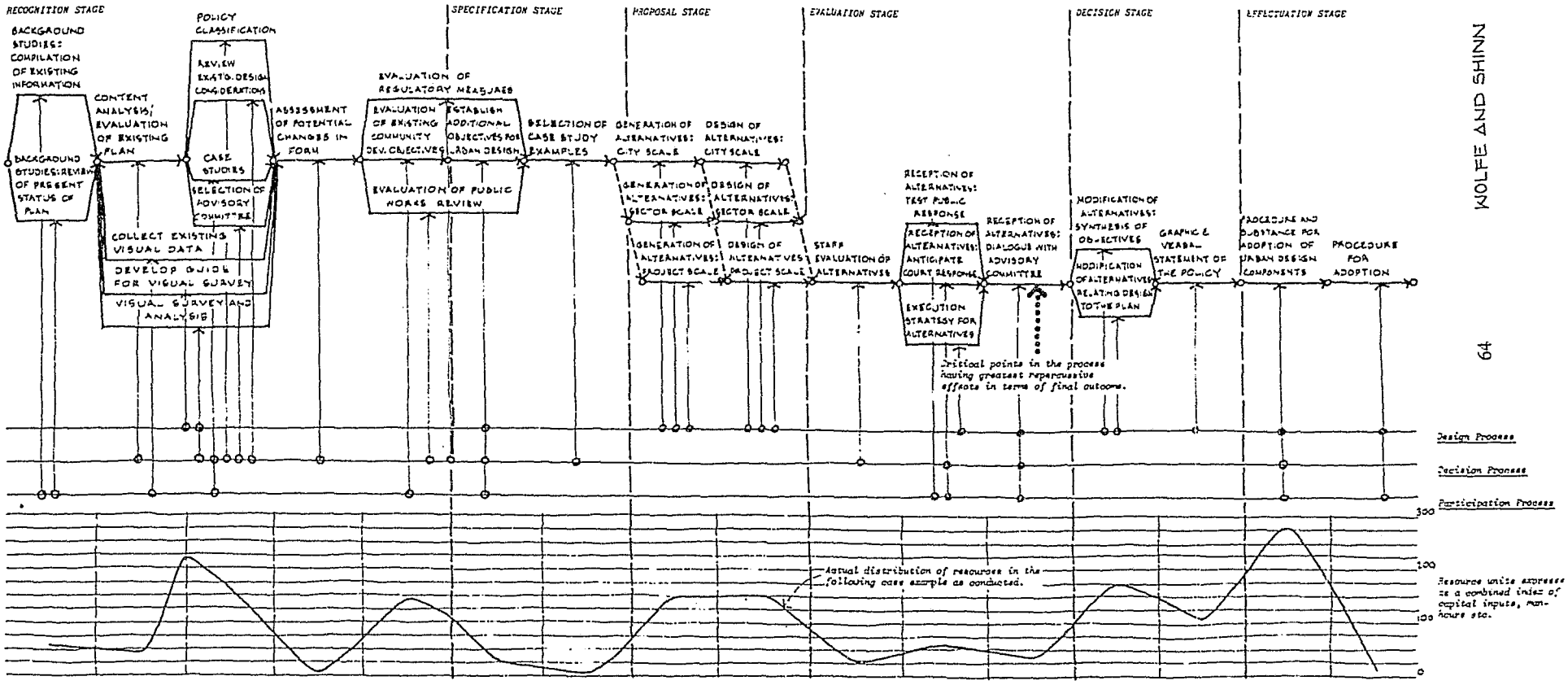


FIG. Y

AS CONDUCTED OPERATIONAL PROGRAM



7.6.0 Summary

The discussions in earlier sections emphasized the dynamic nature of the Urban Environment influenced by technological changes. This final section (chapter 7) has attempted to identify the role and concern of urban design in this regard.

It has emerged that an insightful vision for the direction of the city is necessary. However it has also become clear that urban design is not a product alone, and hence comprehensive design must be avoided, as no single moment can fully understand the complex urban life.

Instead it has been argued that urban design should provide a framework that gives direction for growth, enables participation of different players, allows change to take place naturally through time, with the different socials needs, values and activities that will emerge with changing technologies.

PART TWO: CASE STUDY

CHAPTER 8:
MIDRAND

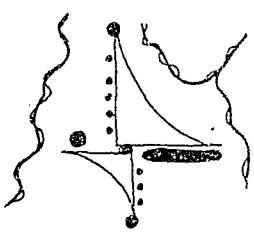
8.1.0 Introduction

This section explores the application of the theme of the discourse. In doing so the section attempts to demonstrate an urban design exercise on a South African city. The exercise focuses on the formulation of a development framework that addresses the fast growing and changing urban environment, which has been increasingly made possible by developments including technology.

An area in Midrand is found to be suitable for this purpose, because the site exhibits a number of the contemporary urban trends that the discourse has attempted to explore. The principles pointed out in section 7 are utilized in arriving at an urban design framework for this fast growing city of Southern Africa.

8.2.0 Precedents

1. CRANE: THE DYNAMIC CITY



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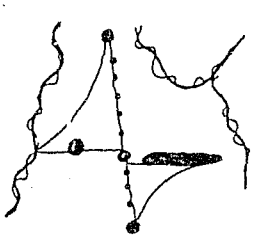

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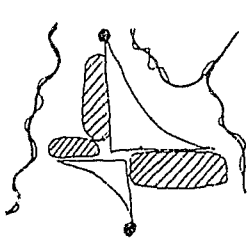

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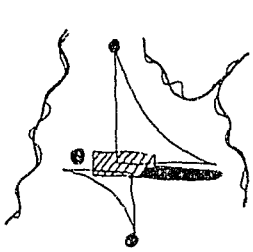

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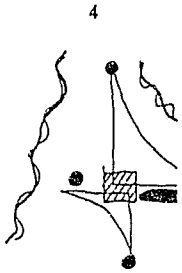


5

diagrams showing city growth. Macro scale changes in the city
CRANE 1960

The following are some points that Crane (1960), has emphasized, and are adopted as useful for the section to follow.

The Dynamic City grows from flexible parts, strong permanent locational rhythms and a dynamic balance of masses.

The challenge (for the designer) lies in finding the right place in hierarchy: the right scale, sequence, life or even the right member of Thousand Designers.

Rather than pretend to solve the important social problems of the day through physical design, we should throw off the tyrannies of `planning for people' cliches ...Because design achieves its highest social purpose when its results leave some things for chance and choice.

Capital designing should become the primary tool of local physical planning...

The Capital Web must become to individual city builders or dwellers what a river or canal is to the desert farmer.

Crane thus highlights the following objectives for any large-scale design philosophy:

-A City, which is a giant message system, or symbolic intelligence apparatus, which provides the citizen with a simple succession of perceptible information needed for utilitarian concerns or for a psychic sense of how the city reflects his and other values.

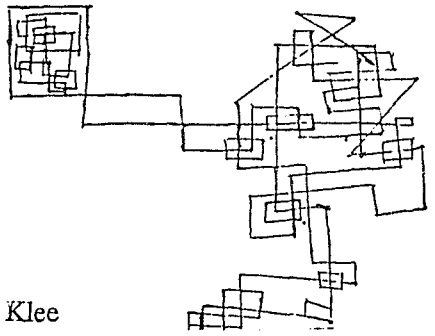
-Reflection of environmental morality and man's long-run interdependence with nature

-Organized change capacity and permanence of structure

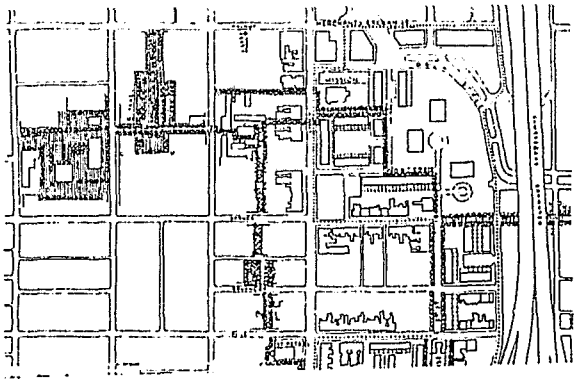
-More concrete and demonstrable processes of making public city-form decisions

-An ordered freedom for private city building

-An unspecific structure sufficient to permit choice and flexibility of individual usage



Klee



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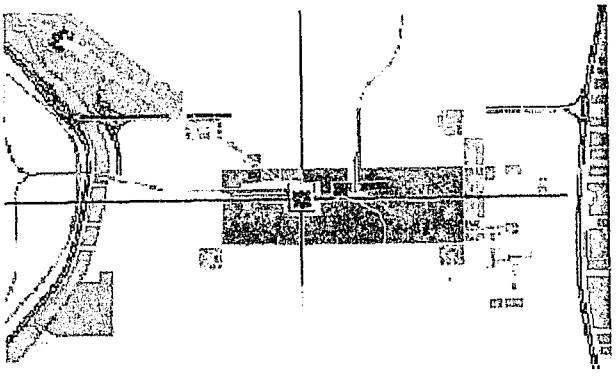
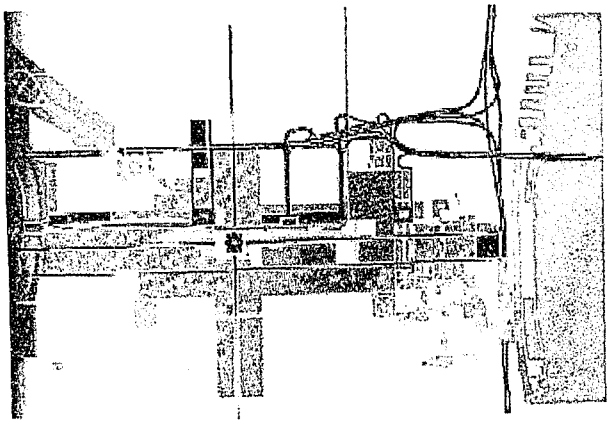




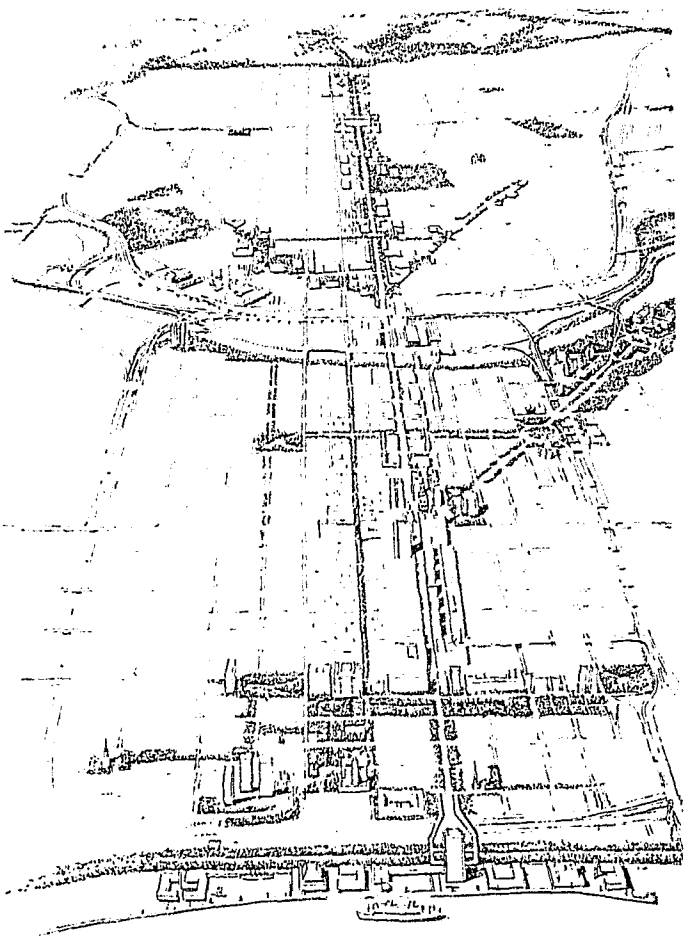
EVOLUTION OF ENTIRE DESIGN STRUCTURE

2. PHILADELPHIA: A MODEL DESIGN STRUCTURE

Philadelphia provides an example of how a design structure could attain integrity and permanence when based on the essential urban preconditions like movement.

Bacon (1967) relates the essential nature of the Philadelphia design idea to Klee's drawing, which consists of lines that suggest, "in its entirety, channels of movement through space". The three towers in Pie's drawing (opposite) were placed in relation to the thrusts of movement and the mass of the five towers. It is the combination of the mass of the towers and the space of the movement that constitutes the essential design structure. Pie has placed and designed his towers that they relate with sensitivity to the delicate and fragile eighteenth-and nineteenth-century structures that form the foreground on the west and south, yet at the same time they serve as a powerful articulation point in relation to the fast movement on the Delaware Expressway, dominating the sweep of the regional flow of the Delaware River.

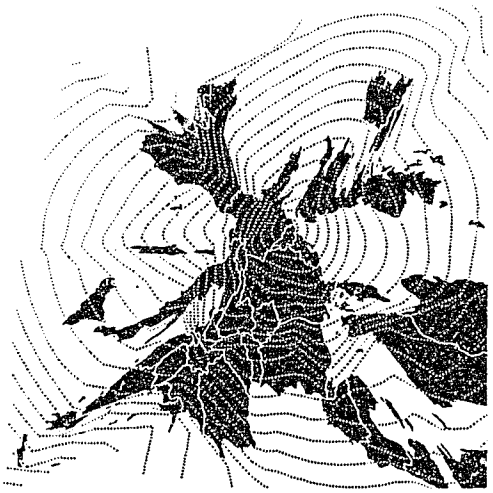
The drawings show the entire design structure of Center City in which the elements are woven together into a total three-dimensional system of space organisation. In black are shown



Independence Hall, the Art Museum at the end of the Parkway, and City Hall at the Intersection of the two 1683 William Penn axes. The central core of most intense activity is shown in Grey, threaded through by the ever growing pedestrian system one level beneath the street, shown in yellow, and the footway one level above the street connecting with the department stores in white

The design structure of Philadelphia did not emerge all at once but was laboriously built up, part by part, over time. It presents unity because each of its parts is related to the other by the principles of an organic growth process. The drawing itself, by its own nature, makes it clear that this is not a final form; the stirring of a new growth and flowering is already present. Many additions and revisions will have to be worked out to meet the new pressures of urban growth. These plans must extend across the land beyond the city limits to provide structure and form to the whole region and channels of energy for the expansion of the city. The objective is to achieve at every moment in time, on the part of every citizen a sense of orientation to a continually enlarging order.

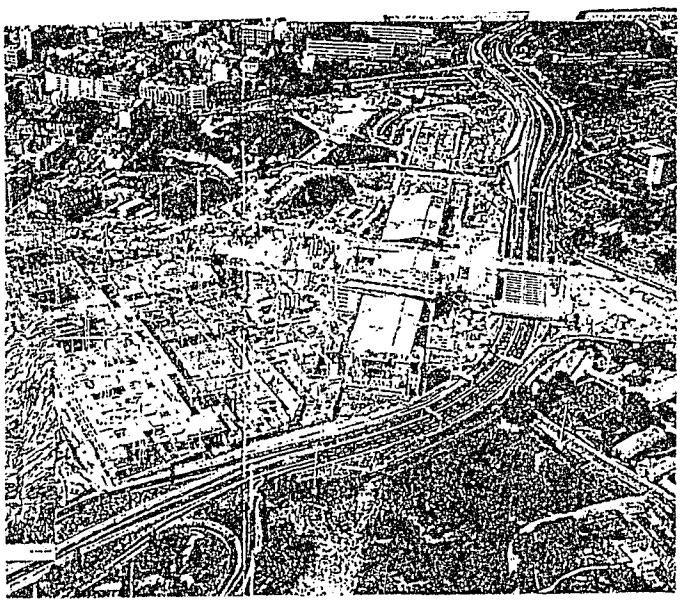
3. LILLE: A TRANSFORMING CITY



LILLE IN TRANSFORMING EUROPE

Lille is a French city that had remained a mining and textile town for a long ime. But with the recent introduction of two important conditions: the tunnel between England and the continent, and the TGV network (the French superfast train that will run through it) the city is expected to transform into a new significance.

The city will become the intersection of major north-south and east-west axes. In addition the reduced travel times, through train and tunnel combined, will minimize the importance of distance and give Lille a strategic position, "...it will become the center of gravity for the virtual community of 50 million West Europeans who will live within a 1and half hour travel distance". (Koolhaas et al 1995)



LILLE : TUNNEL AND HIGHWAY

Eurolille (a public private partnership) thus conceived a program for Lille to ultimately consist of around 800,000 sqm of urban activities that include shopping, offices, parking, a new TGV station, hotels, housing, a concert hall, and congress accommodation. Eurolille notes that the scheme was approached like an entirely new city that had to be inserted into an existing fabric. " This synthetic new city is and isn't part of the old town... It has not been spawned by Lille, it has landed there."

The importance (the new form of attraction) of site is articulated by constructing some of the buildings over the tracks to become part of the TGV network: building and train would become different states of the same system.

4. KANSAI: A CREATIVE NETWORK CITY

"A network city evolves when two or more previously independent cities, potentially complementary in function, strive to cooperate and achieve significant scope economies aided by fast and reliable corridors of transport and communications infrastructure." (Batten 1995)

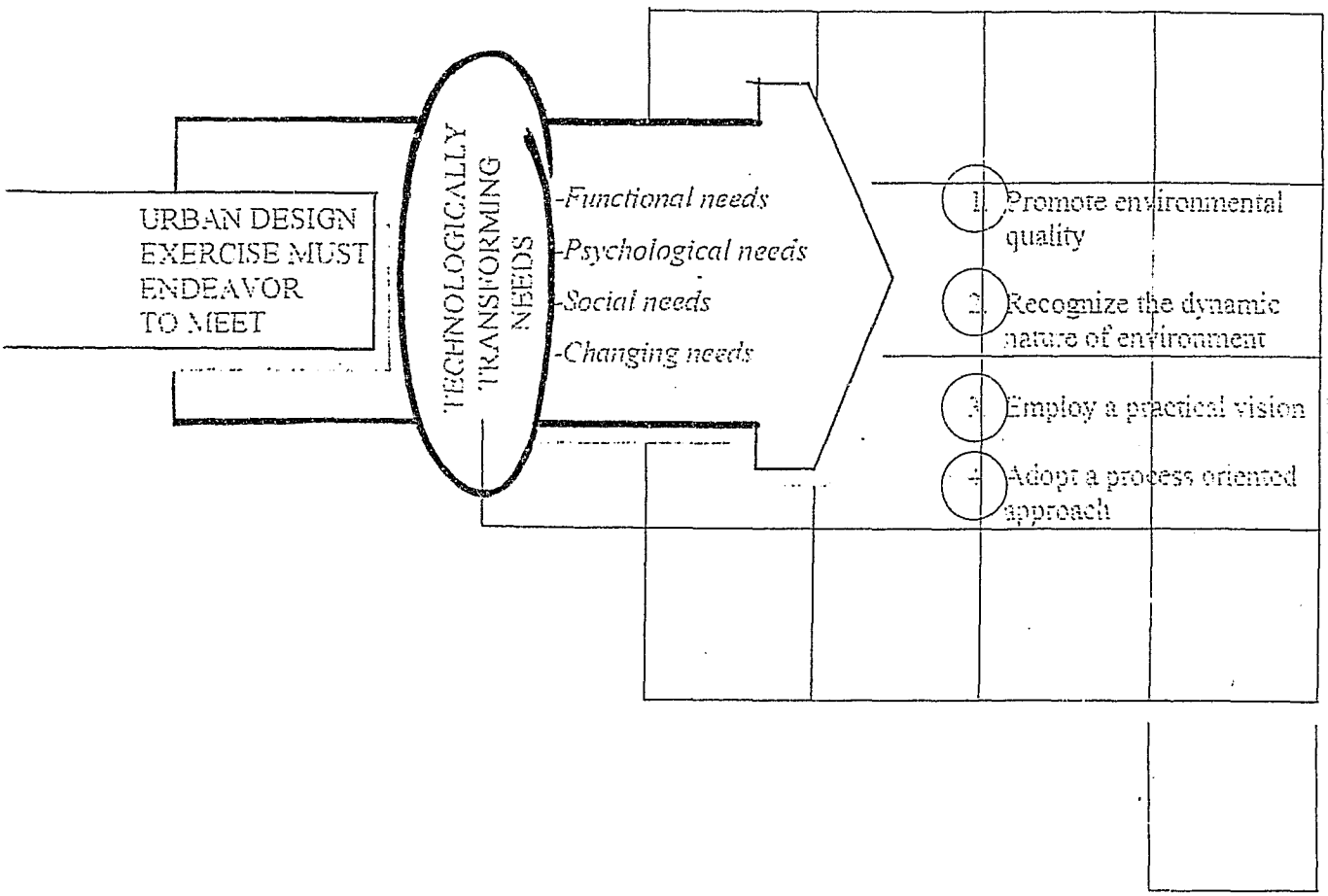
The Kansai (or Kinki) region of Japan is one of such type of urban agglomerations growing in numbers in recent years. It is composed of two former imperial capitals of Japan, Nara and Kyoto, with strong transport links to other cities of Osaka, Hemeji, Nara, Ohtsu and Wakayama. Osaka is the region's center of commerce and industrial activity. The striking contrast between the cultural and commercial cities, combined with their willingness to work together towards a united vision of the future, is claimed to transform the Kansai region into one of the most exciting network cities of the next century.

Much of Kansai's future optimism is based on a spate of recently completed infrastructure projects. There are many large-scale, long-range projects underway. The most prominent of these is the Osaka Bay Area Development (OBD). An Association to promote this maior development was established by the local business community. Their `G and Vision' was announced to the public in 1991. Its aim of consolidating a wide range of urban functions (located in different centers) captures the very essence of a creative network city. With a view of nurturing a `cosmo-creative metropolis', the `Grand Vision' prescribes the following metropolitan requirements:

1. A creatively diversified environment for all citizens through the amalgamation of various urban functions for living, working, leaning and playing.
2. The formation of cultural and knowledge `corridors' which promote interaction among creative minds.
3. An international `around-the-clock' city for global citizens (facilitated by the opening of the 24-hour Kansai International Airport in September 1994).
4. A restructuring of the old industrial structure along with the incubation of new business opportunities
5. The provision of `nature-rich' amenities for the citizens.
6. The sophistication of a polycentric urban structure.

(From Network cities: Creative Urban Agglomerations for the 21st Century, Batten 1995).

Principles drawn from Part One:



8.3.0 Objectives

With the hypothesis outlined in previous sections, it is intended to demonstrate an urban design proposal for the activity strip of Midrand. The exercise intends to reflect on the subject area of the thesis by emphasizing on the points drawn from the theoretical discussions. The objectives are:

-to provide a vision that is based on reality

-to investigate the furnishing of a holistic solution that:

a) provides a range of social, economic and cultural opportunities for the people of Midrand
b) turns Midrand into an important vibrant regional location using the advantages available on the site

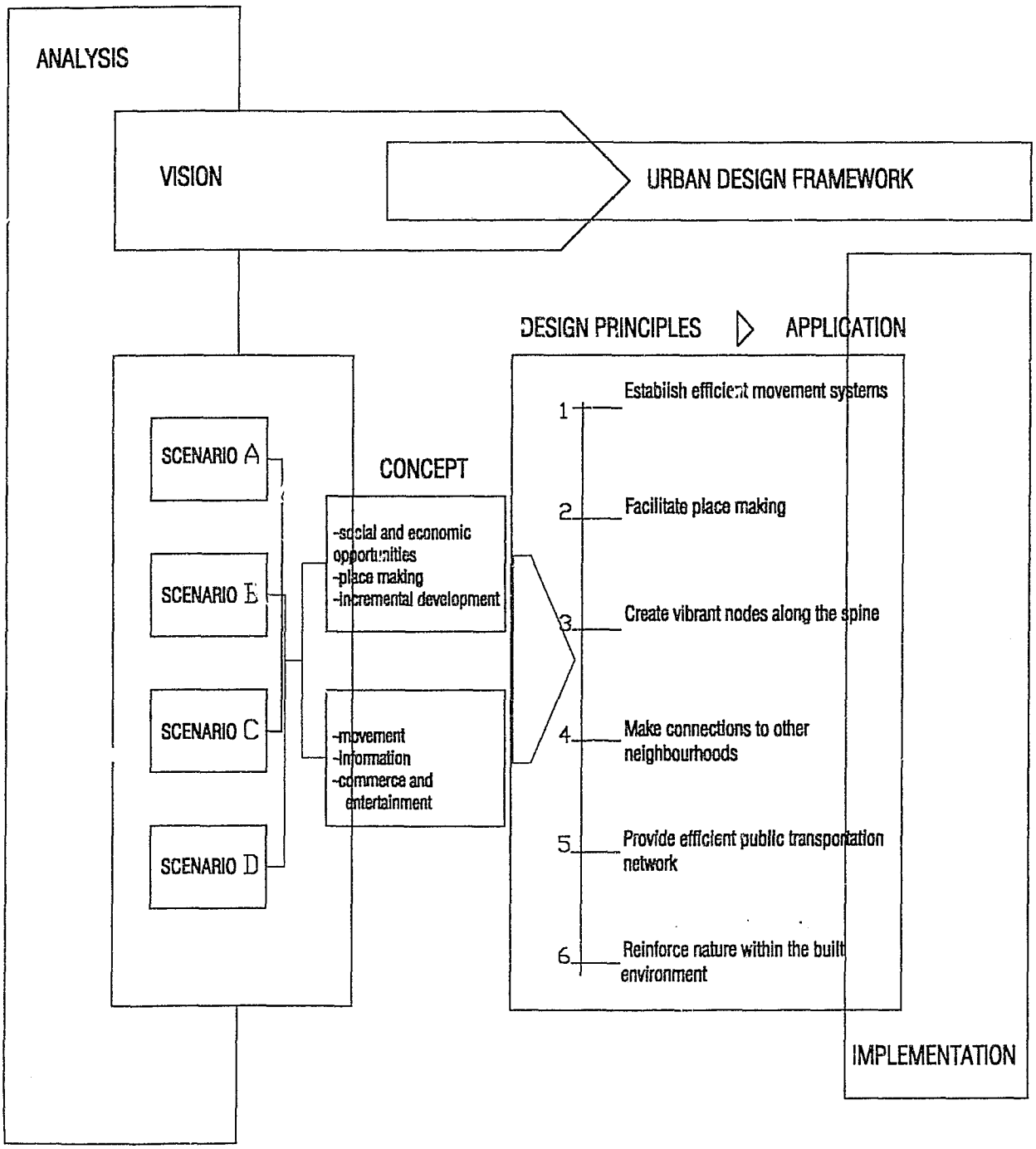
-to maintain a balance between the traditional and new trends of urban life

-to provide useful design principles that will set development directions and potentials

-to demonstrate a process oriented urban design exercise that will ensure the realization of a vision

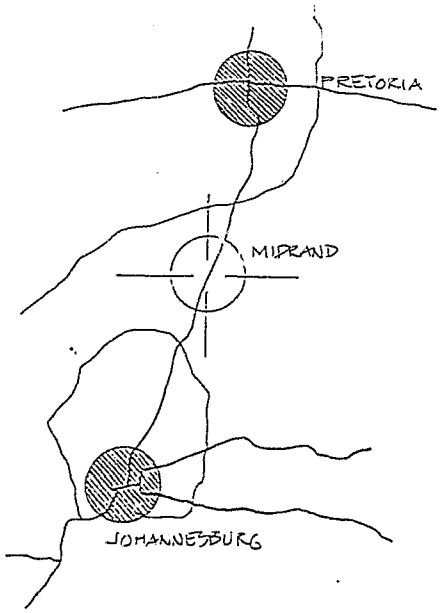
Although a number of scenarios are compared, it should be observed that the solution aimed at is not ultimate. At no stage could it be possible to completely determine the changing priorities, and thus would be over ambitious to hope to decide on the final form of the urban environment.

8.4.0 PROCEDURE



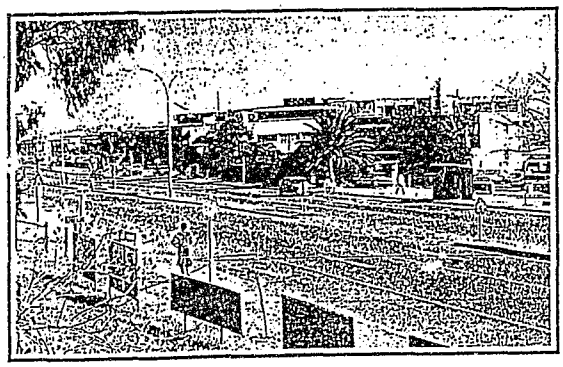
8.5.0 Analysis

8.5.1 Brief history of Midrand



At exactly halfway, on the route between Pretoria to Johannesburg, an activity node started to grow. It all started in the last century at the Halfway House when it became the 'pitstop' for the Zeederberg mail coach. With the opening of a bar in 1870, and later the Halfway Hotel in 1888, the location gained fame as a health and holiday resort. Halfway House since remained a stopping place on the coach route between Johannesburg and Pretoria.

Later population growth in the region coupled with improvements in communication and infrastructure developments started to yield renewed interests in Midrand, and Midrand started to register fast developments. In 1981 Halfway House was incorporated in Midrand, which also comprised the loosely knit communities of Olifantsfontein and Clayville.

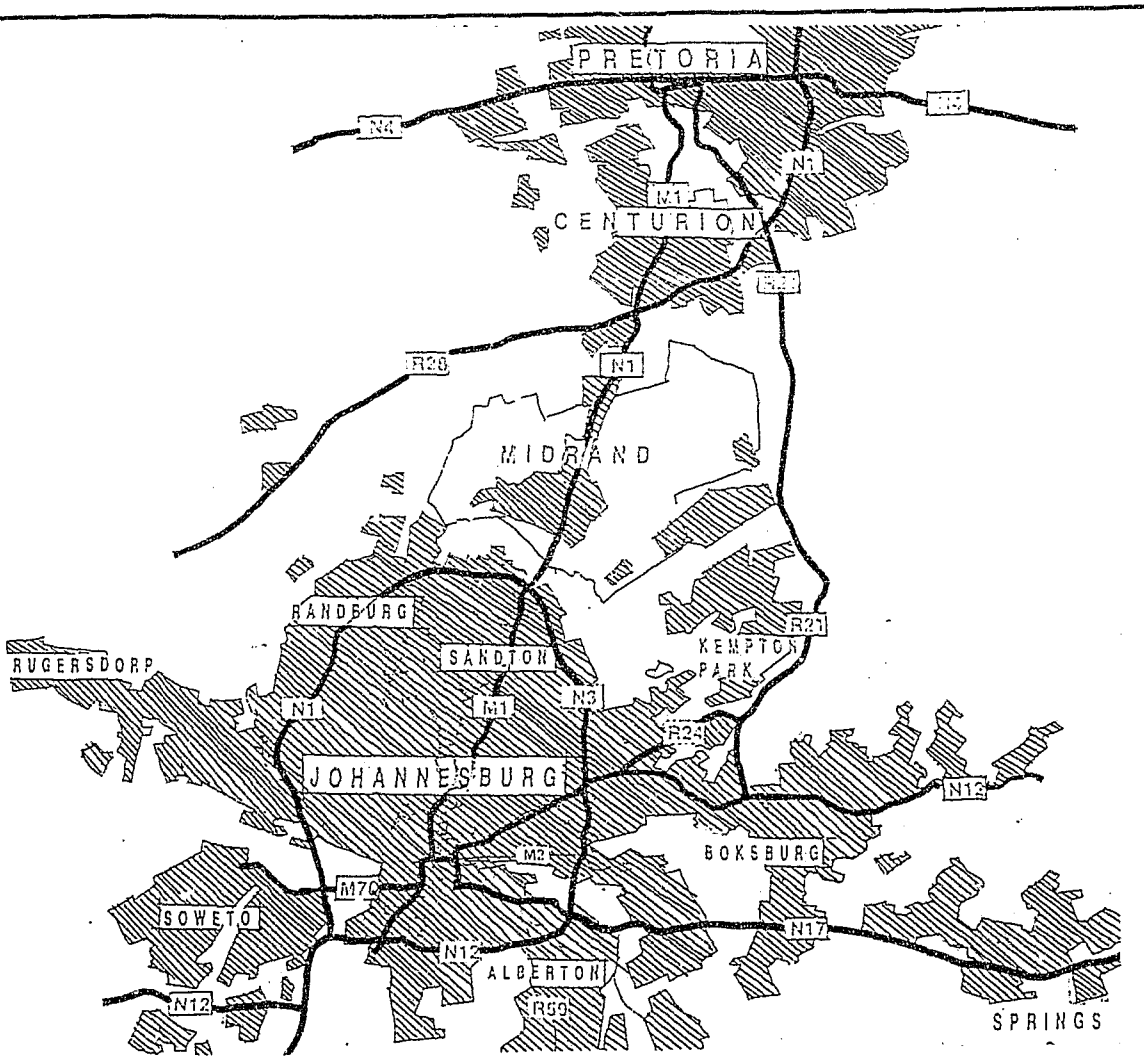


The Old Pretoria Road at Halfway House

Midrand today is part of the Kyalami Metropolitan Region. In the next 25 to 30 years it is indicated that the region will accommodate in order of 20 million people (GAPS 1990). The draft vision 2025 document of the Metro (in IDP 1998) identifies Midrand as a key area for the future growth and development of the region. Midrand has enormous potential growth in development of electronic, light industrial, heavy industrial, service and commercial shopping and office accommodation. Therefore it is generally recognized as a desirable address in terms of new economic developments. Statistical studies reflect that only 48% of Midrand residents work in Midrand, other major sources being from Johannesburg, Sandton and Randburg.

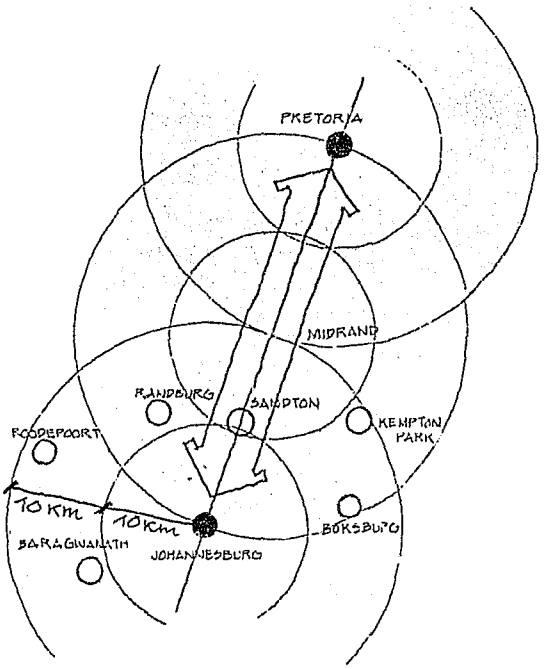
The area of Midrand is just under 200 sq. kilometers. The present population is estimated to be 160,000 and is estimated to reach between 330,000 and 480,000 by the year 2010.

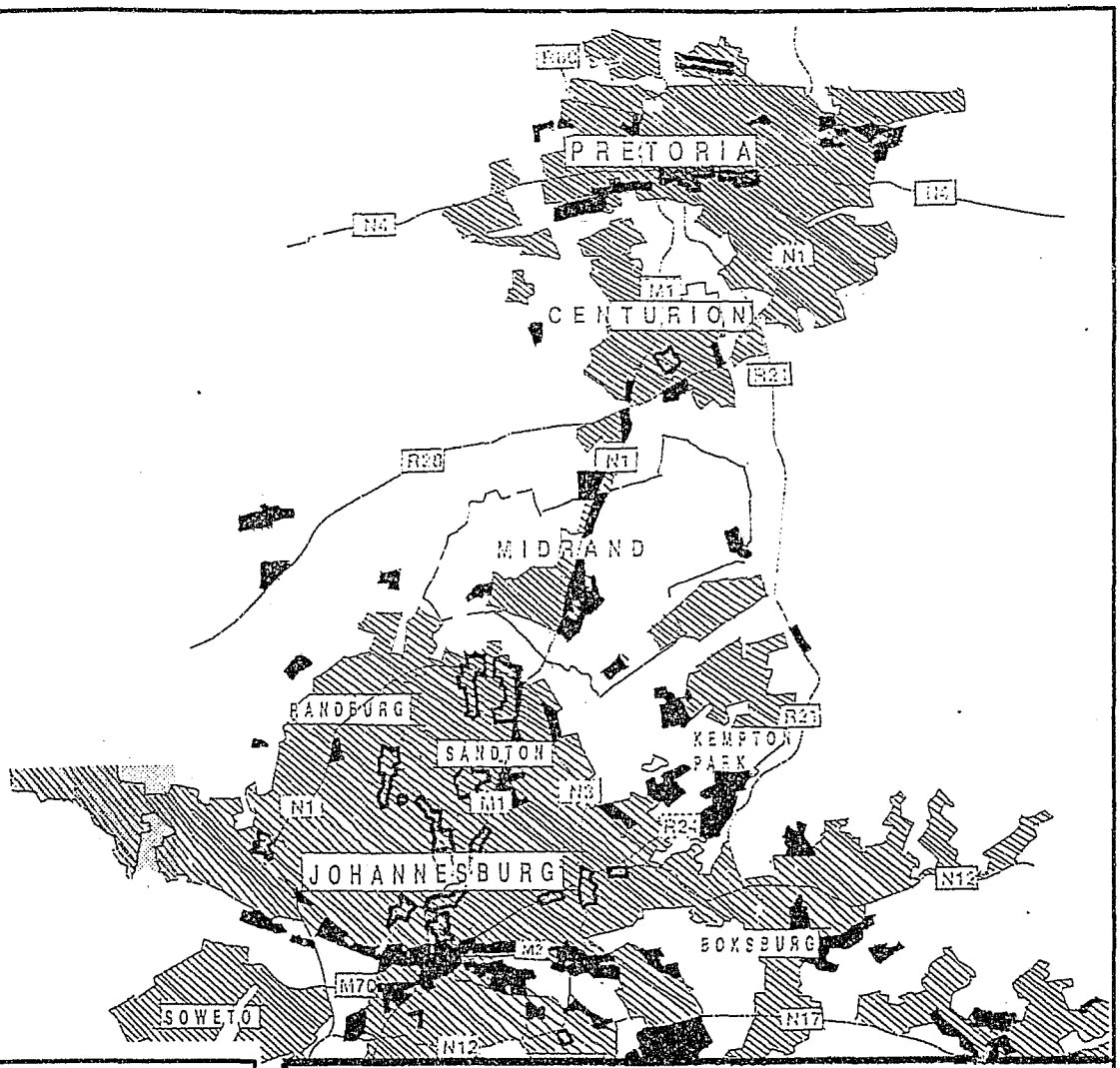
8.5.2 Analysis drawings



LOCATION

Midrand is located 'in the heart of Gauteng', halfway between Johannesburg and Pretoria. It is easily accessed by road via the N1 and the R21. It is serviced by its own airport, and lies within 20km of Jan Smuts and Lanseria Airports.



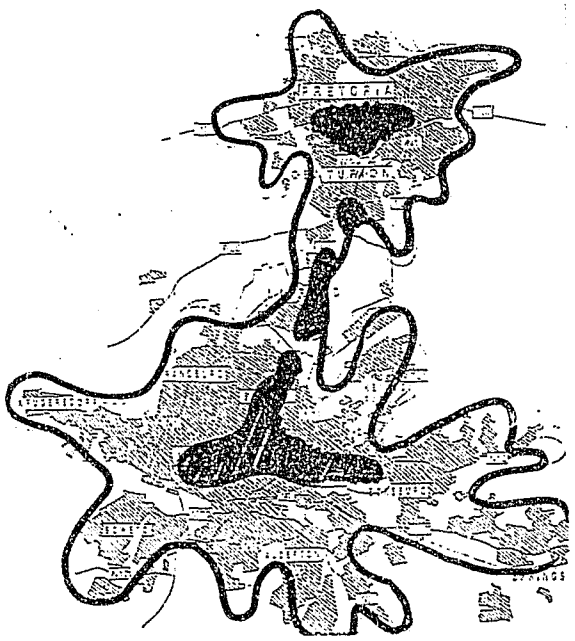


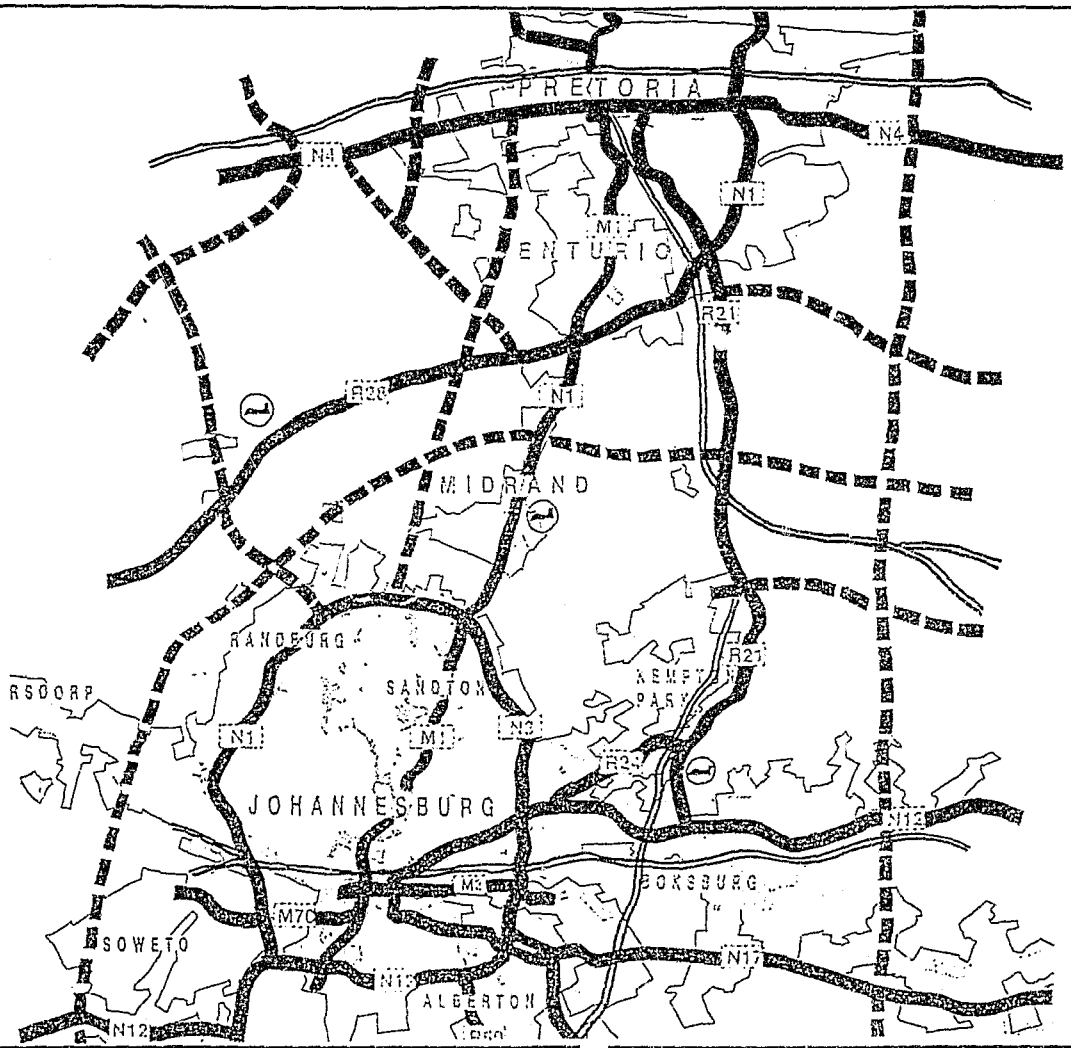
REGIONAL GROWTH

RESIDENTIAL

OFFICE

INDUSTRIAL

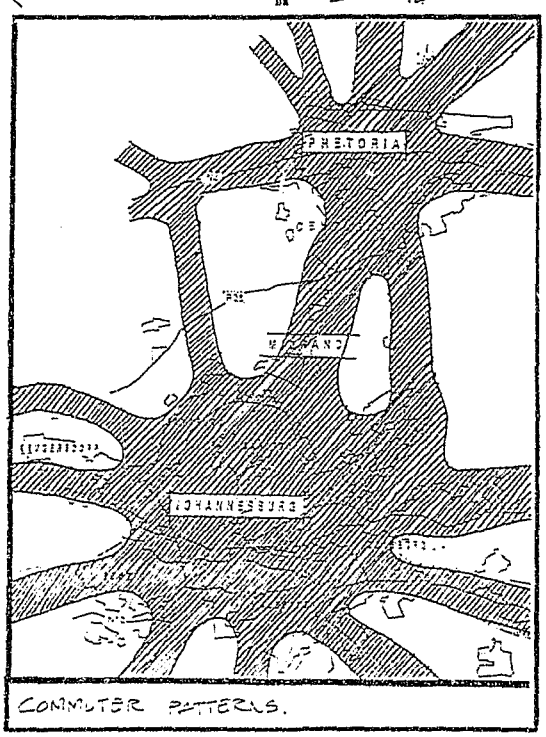




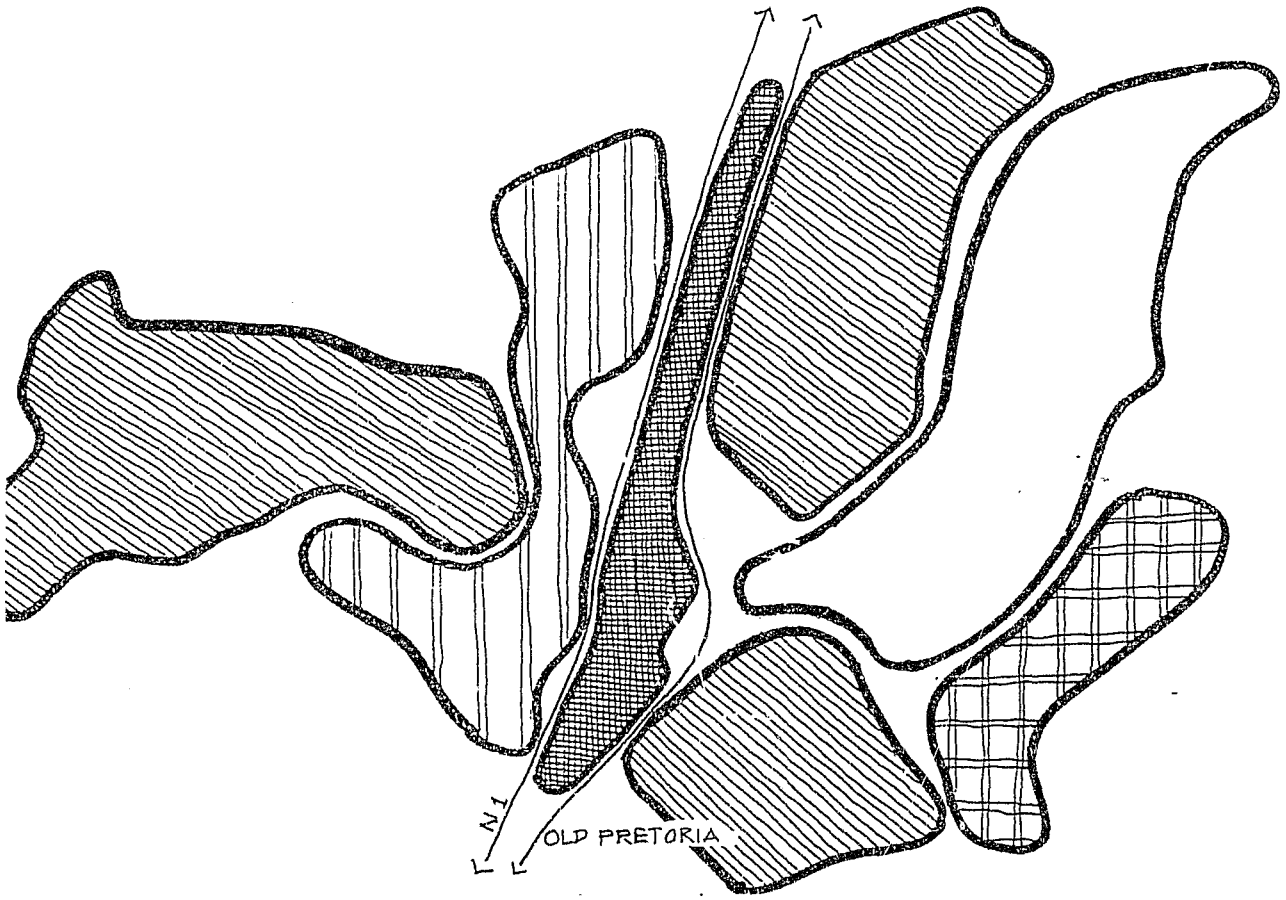
CONNECTIVITY

There is strong connection of Midrand to National and regional road networks. It has its own airport. The railway system does not include Midrand strip but connects Tembisa which is in close proximity to Midrand.

- MAJOR TRANSPORT LINKAGES
- PROPOSED PWV ROUTES
- RAILWAY LINE
- AIRPORT



COMMUTER PATTERNS.



PREDOMINANT LAND USE

- INDUSTRIAL/COMMERCIAL
- RURAL RESIDENTIAL
- RESIDENTIAL TOWNSHIP
- LOW COST HOUSING
- AGRICULTURAL

RESIDENTIAL

Residential in Midrand is increasing rapidly. In recent years houses have made up 80% of annual increase in formal housing stock.

RETAIL

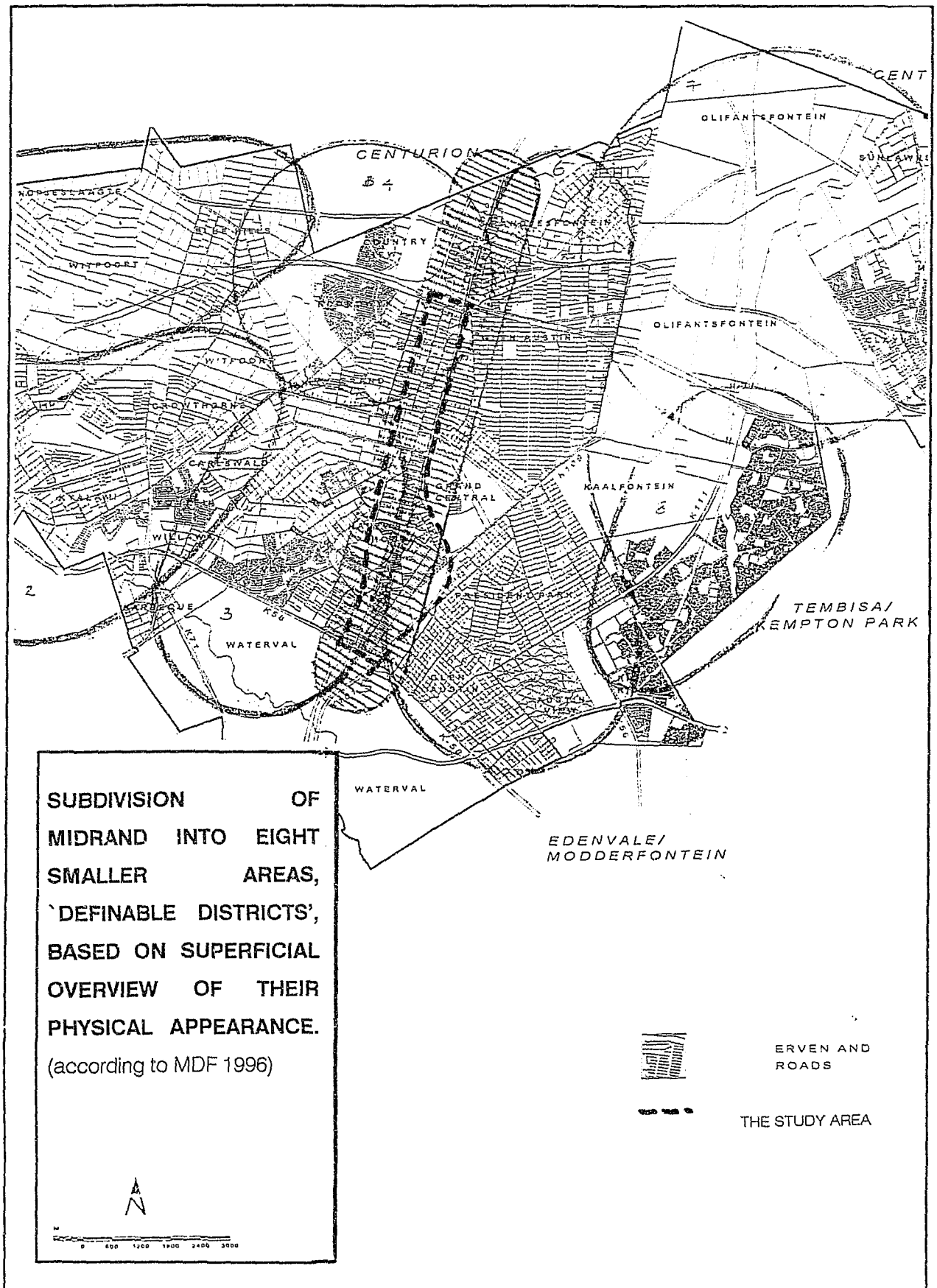
Shopping and office are rapidly growing linearly along the Old Pretoria Road. These facilities are now amounting to 75 000 sqm.

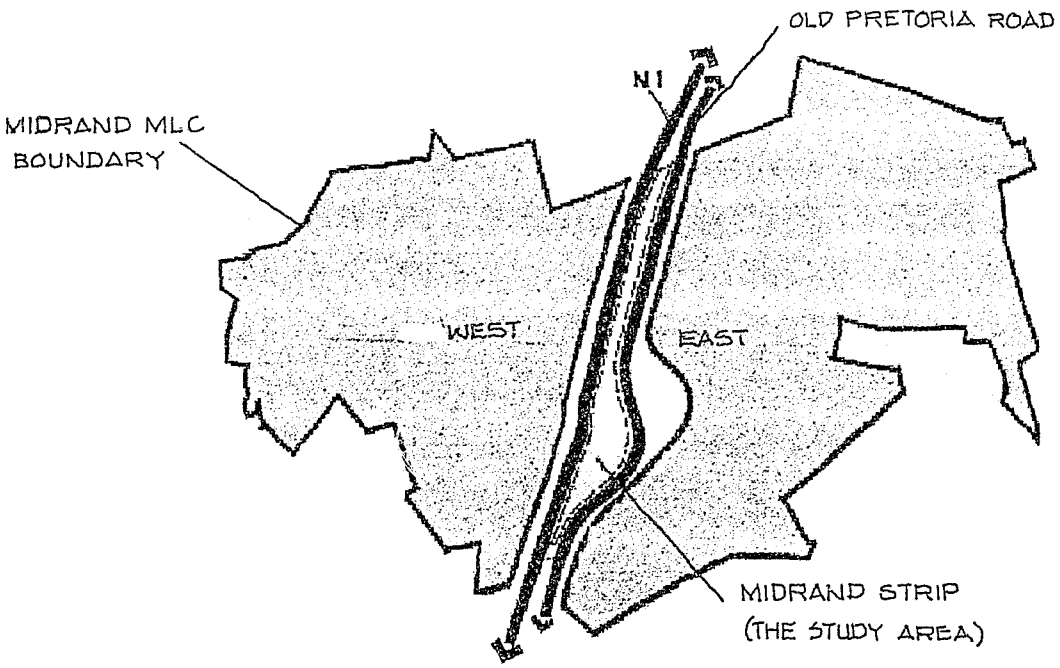
INDUSTRIAL

Industrial buildings are a major feature of the Midrand landscape. Clean air industrial parks and factories are being rapidly developed. Over the last five years, new industrial buildings to the value of over R200 million have been completed.

OFFICE

The amount of office space in Midrand was estimated at almost 100 000 sqm in 1992 and has been increasing at the rate of approximately 30 000 sqm per year since then.

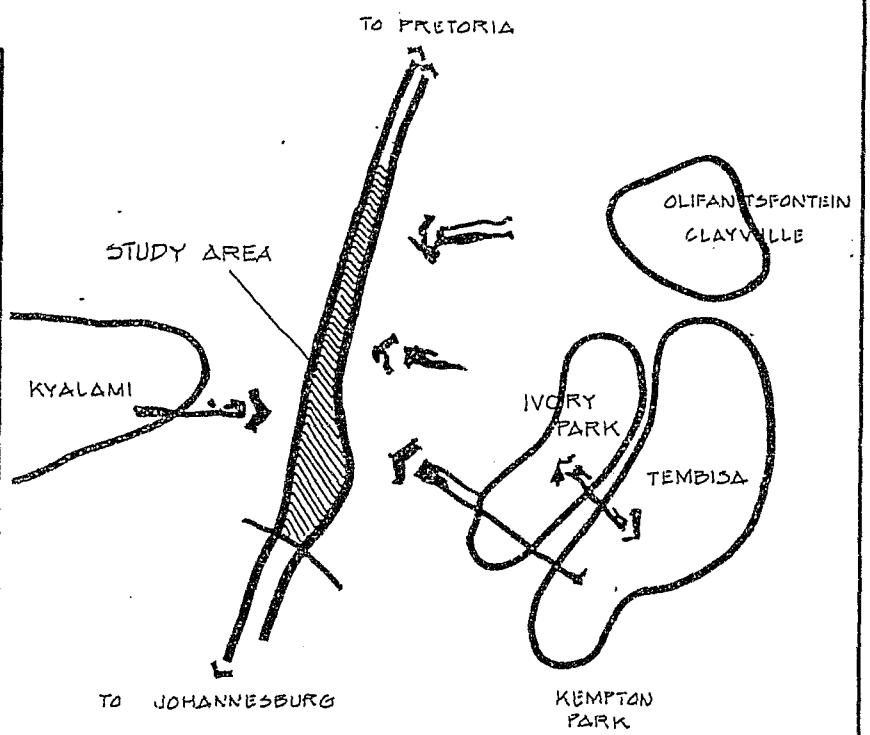

CENTURION
OLIFANTSFONTEIN
WITPOORT
KAALFONTEIN
WATERVAL
TEMBISA/
KEMPTON PARK
EDENVALE/
MODDERFONTEIN
SUBDIVISION OF MIDRAND INTO EIGHT SMALLER AREAS, `DEFINABLE DISTRICTS', BASED ON SUPERFICIAL OVERVIEW OF THEIR PHYSICAL APPEARANCE.
(according to MDF 1996)
ERVEN AND ROADS
THE STUDY AREA

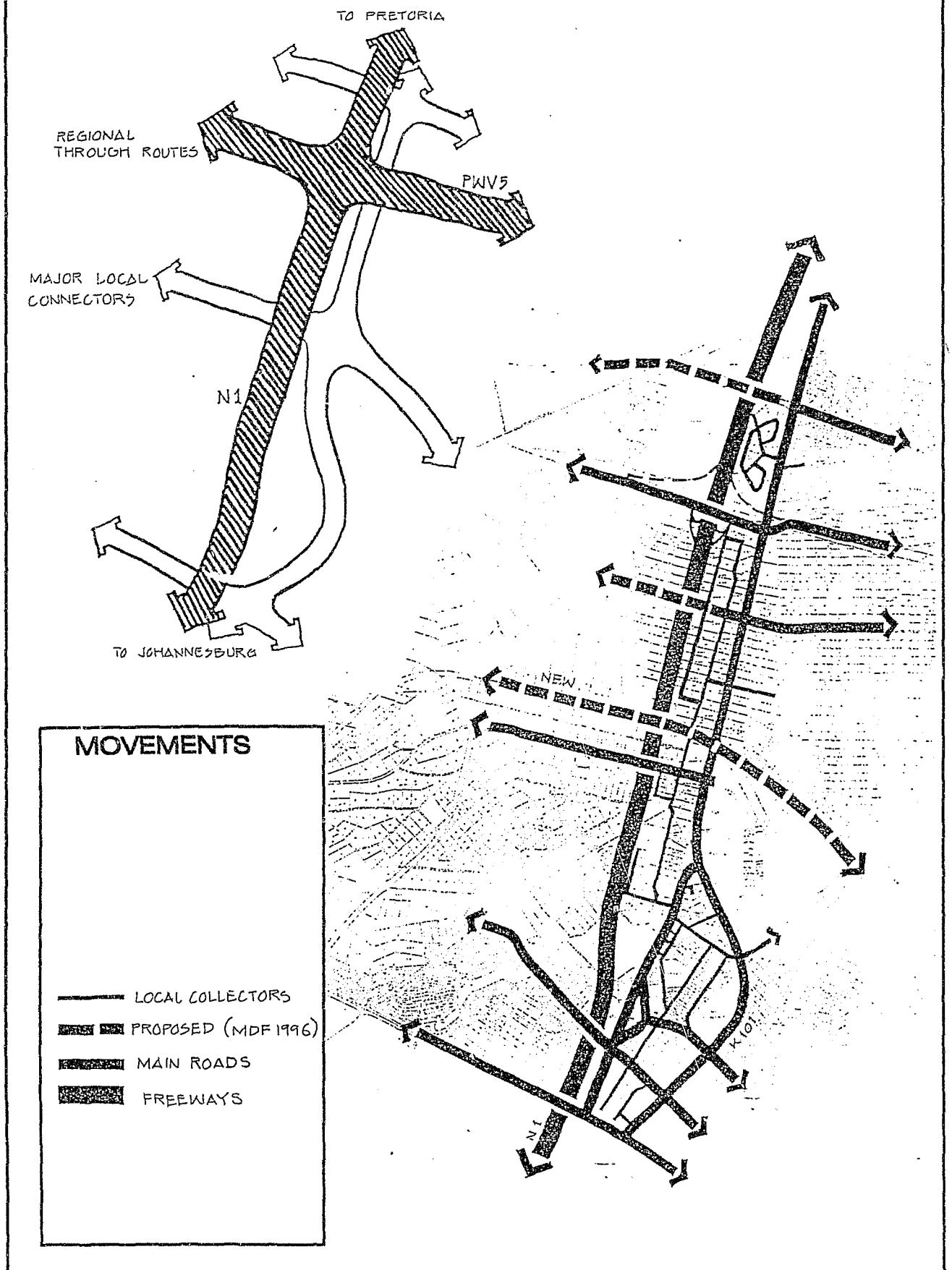


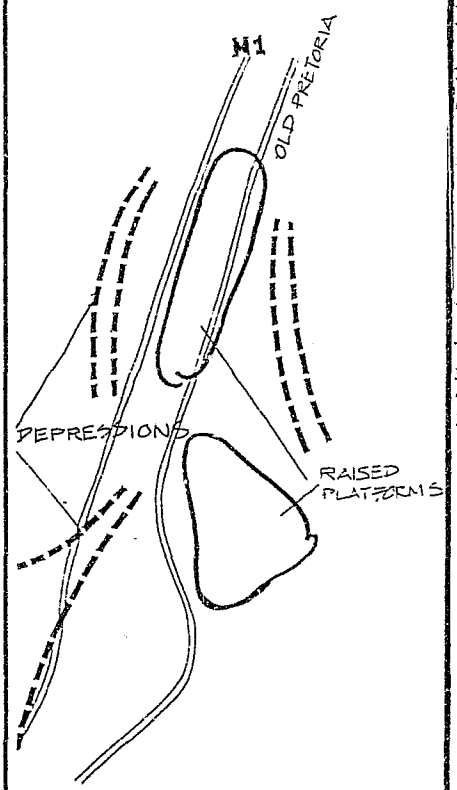
THE STUDY AREA

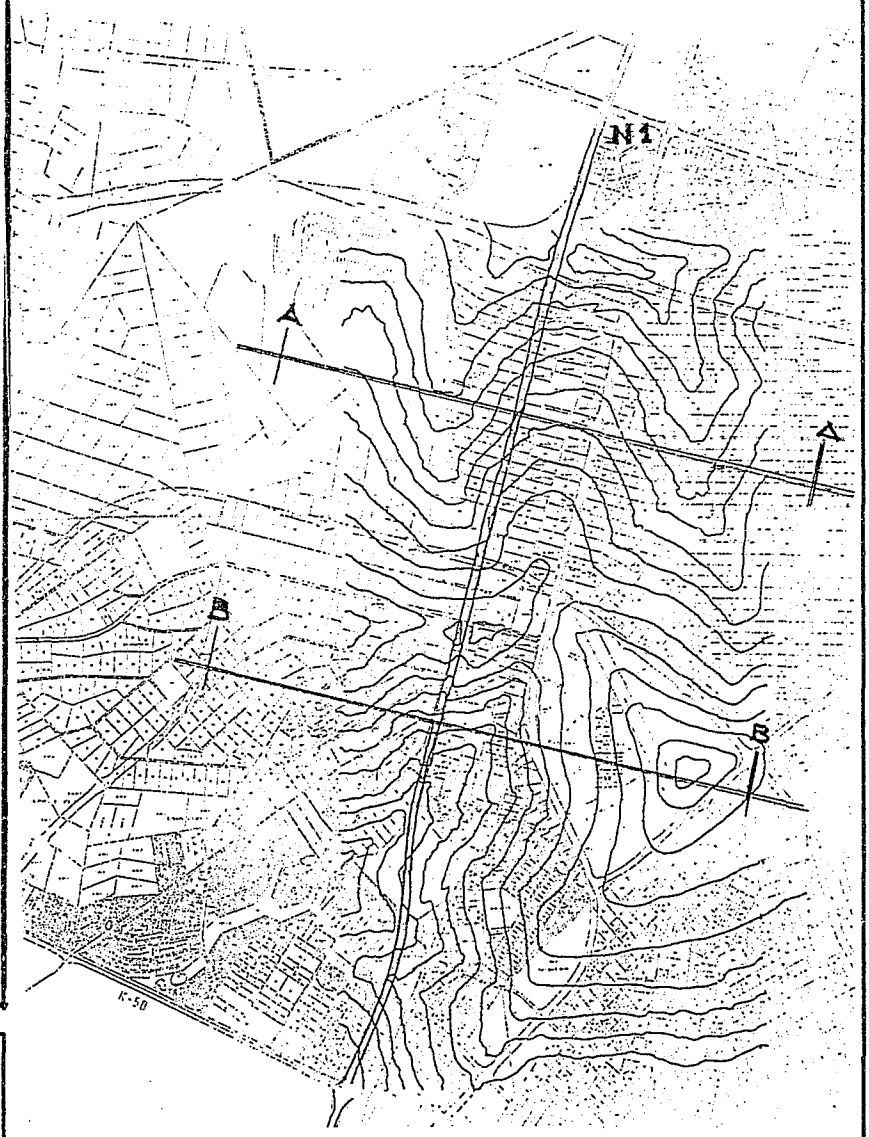
The study area is defined by two North-South roads: the N1 and Old Pretoria Road. This forms a strip that tends to split Midrand into two parts.

The strip is in physical proximity to other residential communities, though easy connection in some instances is limited (Ivory Park, Tembisa).



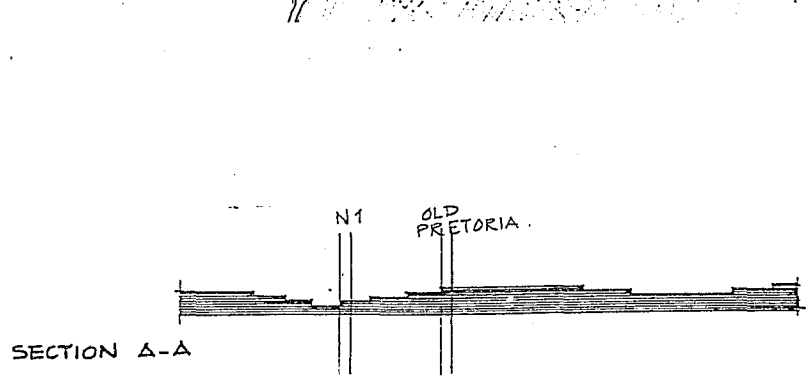

TO PRETORIA
REGIONAL THROUGH ROUTES
PWV5
MAJOR LOCAL CONNECTORS
N1
TO JOHANNESBURG
NEW
K101
N1
MOVEMENTS
LOCAL COLLECTORS
PROPOSED (MDF 1996)
MAIN ROADS
FREEWAYS

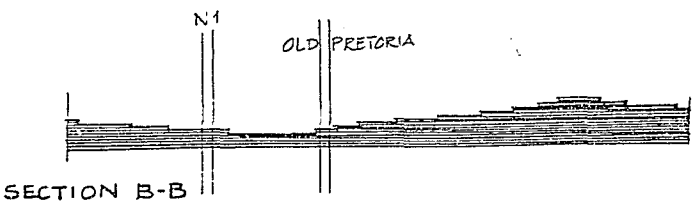


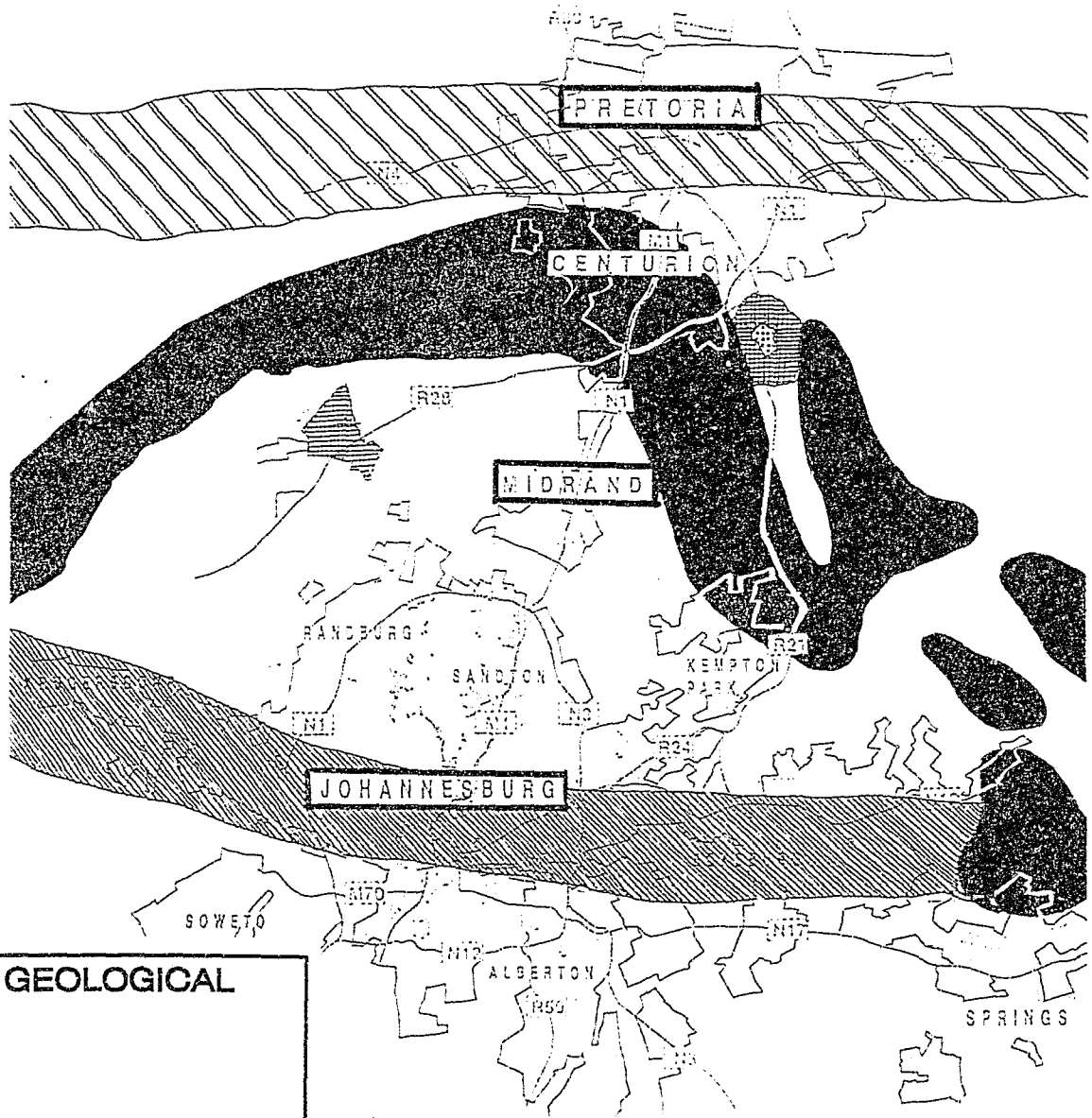


TOPOGRAPHY

CONTOURS AT 100 m INTERVALS







GEOLOGICAL

- DAM
- NATURE RESERVE
- MAGALIESBERG RANGE
- WITWATERSRAND RANGE
- DOLOMITE

8.5.3 Constraints and opportunities

A number of problems and opportunities have been identified in MDF 1996 and the community, concerning the entire Midrand area. The Central Activity District (the study area) is discussed In MDF as follows:

"...This district is characterised by strong commercial growth which tends to dominate all other uses. The residential component is shrinking as land is rezoned for commercial use. This area is the shopping area of most of Midrand's residents, including Ivory Park. Plots seem to be very large. Development tends to be walled and isolated. There is little spatial enclosure normally associated with a city center. Traffic and poor quality signage dominate the public realm. There is little planting within the CBD. (Midrand Development Framework 1996)

Based on the results of the analysis and views of the community, the following are therefore a list of constraints and opportunities for the study area.

CONSTRAINTS:

1. Midrand strip
   -Midrand strip detaches the city into two different parts.

2. Axial development
   -Opportunities of the strip development and freeway not sufficiently exploited.

3. Integrated approach
   -Lack of integrated development that recognises Midrand's regional position.

4. Interconnections
   -Hierarchy and clarity of road network

5. Transportation
   - Provision of public transportation systems not properly exploited.

6. Preservation and introduction of nature
   -Less trees and natural elements in the area, and open spaces not accessible.

7. Less friendly to pedestrian users at places

OPPORTUNITIES:

1. Strategic location
   -Strategically located in PWV region halfway between Pretoria and Johannesburg.

2. Connectivity
   -Has good regional accessibility (roads, rail, air)

3. Availability of land
   -Area is not yet used intensively
   -Large portions of land available for future development

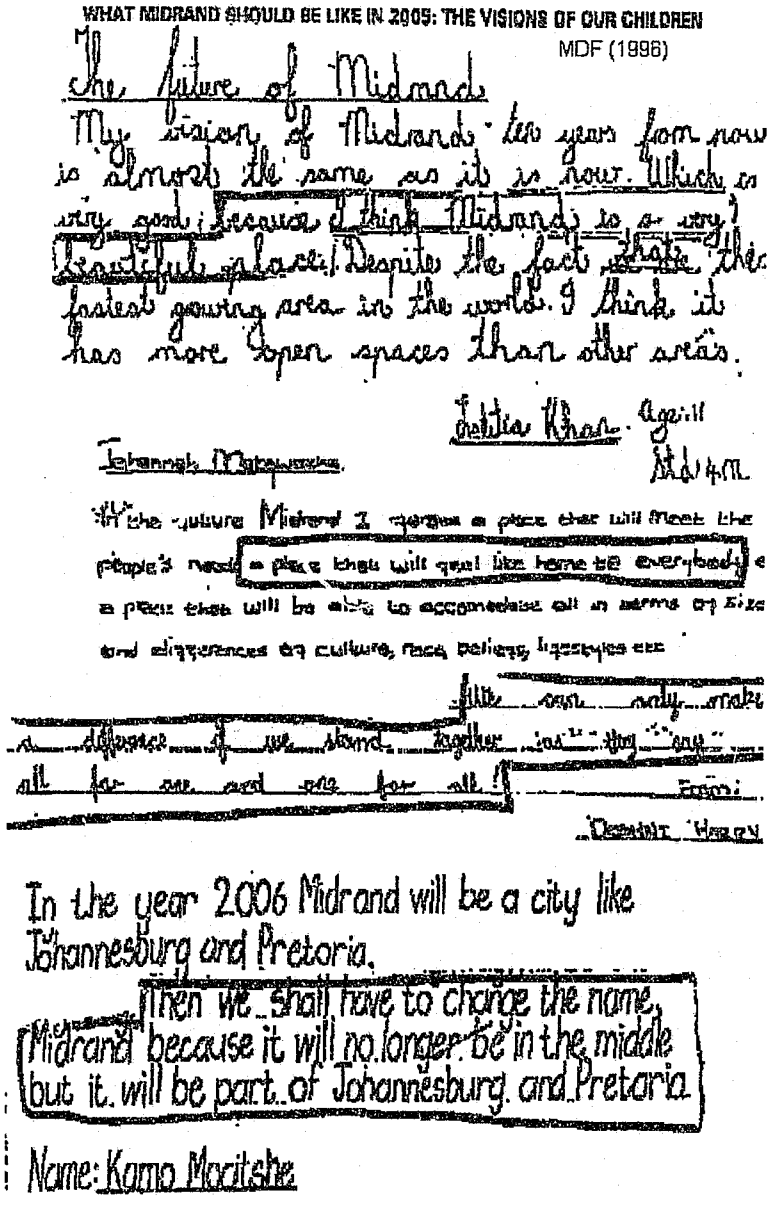
4. Quality of environment
   -High quality of environment suitable for clean industries and residential uses.

5. Attracts activities
   -Midrand's position does not only attract uses and activities that spill from Metropolitan areas but also new international and local investors.

6. Open space potential
   -Vast underdeveloped part of Midrand and the presence of fine old trees along Old Pretoria Road present an opportunity for integrating nature in the environment.

8.6.0 Revising the vision for Midrand

In MDF1996 the results of a public participation program campaign that was launched to include the views of Midranders in the development framework is shown. The program was based on direct interactions with the general public, and included the views of different groups of the community.



WHAT MIDRAND SHOULD BE LIKE IN 2005: THE VISIONS OF OUR CHILDREN

MDF (1996)

The future of Midrand

My vision of Midrand ten years from now is almost the same as it is now. Which is very good because I think Midrand is a very beautiful place. Despite the fact that the fastest growing area in the world. I think it has more open spaces than other areas.

Lalitia Khan. Age: 11

Johannah Makgwatha. Std 4M

In the future Midrand I [illegible] a place that will meet the people's need a place that will feel like home to everybody a place that will be able to accomodate all in terms of size and differences of culture, race, beliefs, lifestyles etc

[illegible] can only make a difference if we stand together [illegible] all for one and one for all! From:

[illegible]

In the year 2006 Midrand will be a city like Johannesburg and Pretoria.

Then we shall have to change the name, Midrand because it will no longer be in the middle but it will be part of Johannesburg and Pretoria

Name: Kamo Mocitshe

The outcome of the vision components of the campaign was as follows:

-wholesome and fulfilling way of life
-environmentally friendly atmosphere
-residents should be happy to be born, live and to die in the area
-balance must be achieved in opportunity and population for both work and play
-not town planning but community planning
-preserve natural watercourses/ wetlands as open areas
-green areas to form a green network for recreation

MDF bases this result to develop a vision for Midrand and describes it as:

Midrand should be a peaceful and socially integrated community with a high level of employment and a fair tax base to ensure an equitable distribution of infrastructure, services and amenities. e.g. health, social, education and retail. The city itself will have good internal and external linkages, using both public and private transport and a mixed land use pattern to maximize the use of scarce resources and contribute to equity and integration. Decision making will be based on community consultation, equal importance being given to man and the environment and will take into account regional, and national development initiatives. (MDF1996)

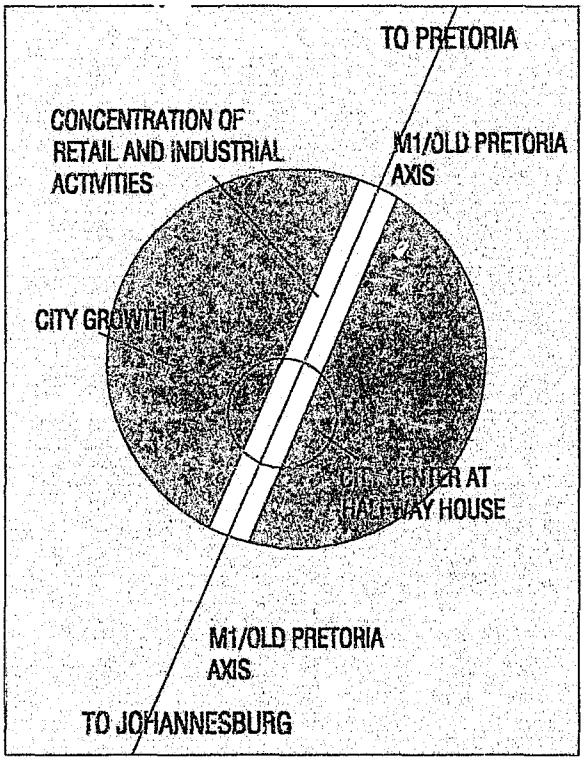
It will be useful to integrate the above into the larger picture that shows Midrand in its unique context. Referring to its historical development the future directions of Midrand can be analyzed.

The following pages will therefore compare the different possible scenarios for the future development direction of Midrand.

SCENARIO A

MIDRAND AS A NUCLEAR CITY

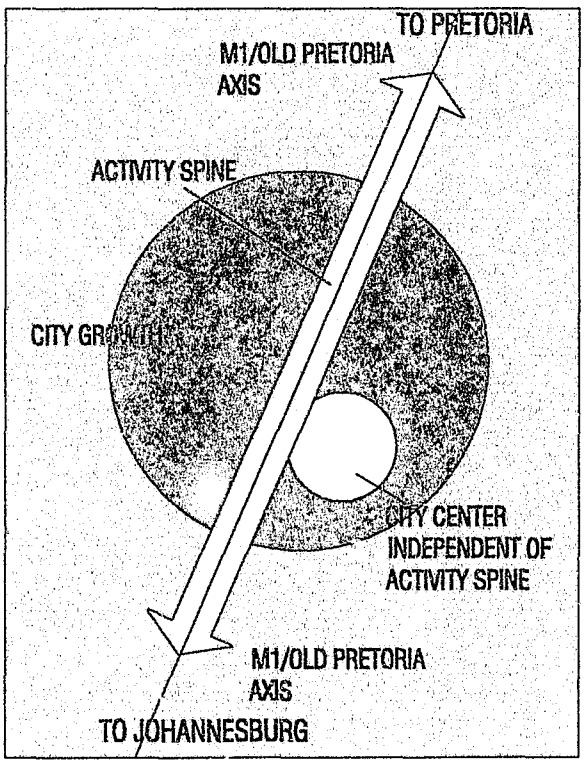
The origin of Midrand is traced back to the emergence of a center at Halfway House on the Old Pretoria Road. The growth of Midrand may take the shape that references such a center. Its proximity to an important route (N1/Old Pretoria) will be a great advantage bringing Midrand closer to the two metropolitan cities of Johannesburg and Pretoria. However, the city will grow in a nuclear fashion engulfing and creating opportunities to Midrand area and nearby settlements like Tembisa and Ivory Park.



SCENARIO B

MIDRAND AS TWO SPARATE 'CITIES'

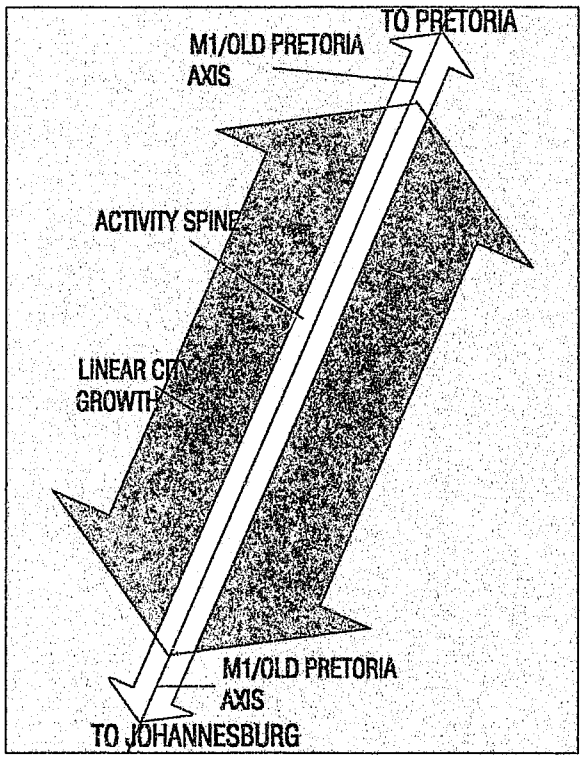
Midrand exists on two different levels. The activity strip, stretching along N1/Old Pretoria Road, belongs more to the larger region than to local Midrand. Its development is dependent on, and is part of the growth of the PWV region. The Local city of Midrand on the other hand may exist separate from this phenomenon. This part would continue to develop as an independent city meeting the local urban social and economic needs of its inhabitants and nearby settlements.



SCENARIO C

MIDRAND AS A LINEAR CITY

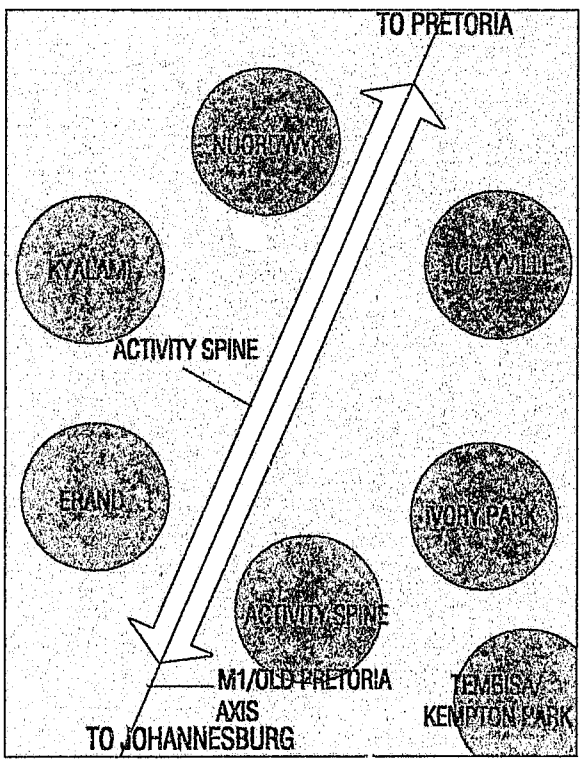
In the early days, the importance of Midrand was limited mainly as a stop point for recreation between Pretoria and Johannesburg. Its significance as a place started to grow with the increased perfection and availability of infrastructure and faster means of communications. The future of Midrand will therefore be dependent on such an infrastructure, of whom the Johannesburg- Pretoria freeway and Old Pretoria Road play the major role. As a result, Midrand's growth will continue to take place linearly, following the axis defined by these routes connecting Major Metropolitan cities.

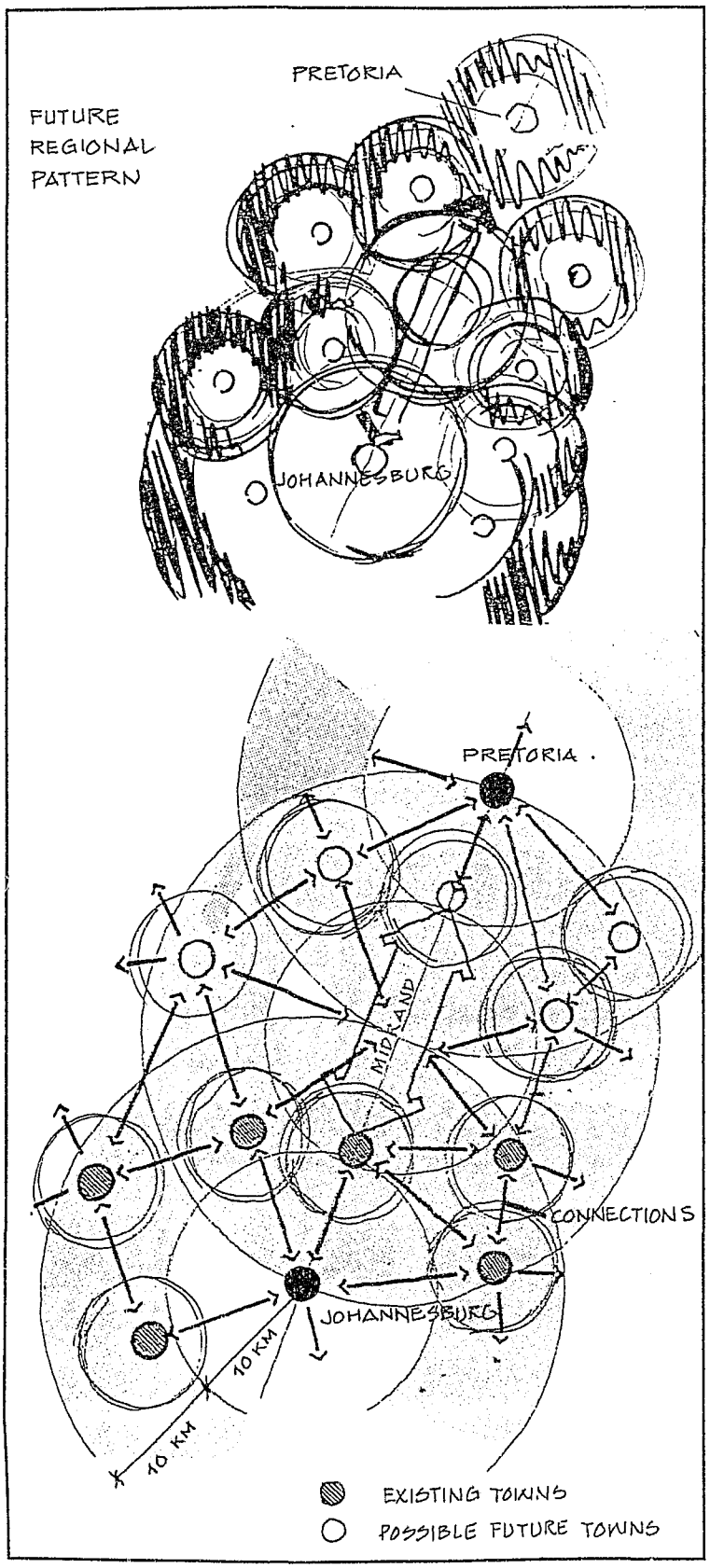


SCENARIO D

MIDRAND AS A NETWORK CITY

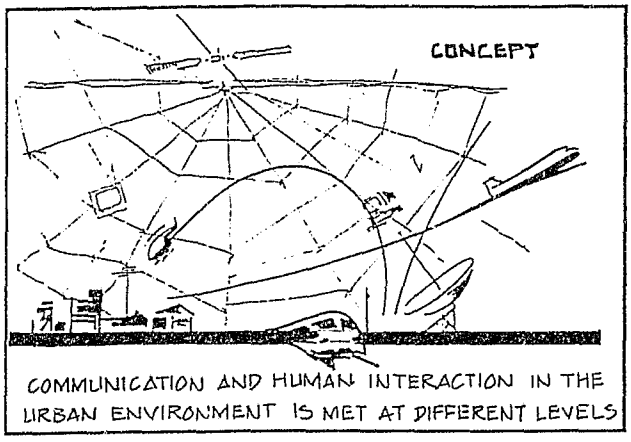
At present Midrand exists as fragmented elements of different urban settlements and components (high and low densities residential neighborhoods, townships, an activity corridor, and farming areas). Its future development is likely to continue to reinforce this pattern. However a stronger relations and interconnections amongst towns and activities will develop creating opportunities to each other. With such development trends Midrand will be able to bring out unique place qualities of each town.



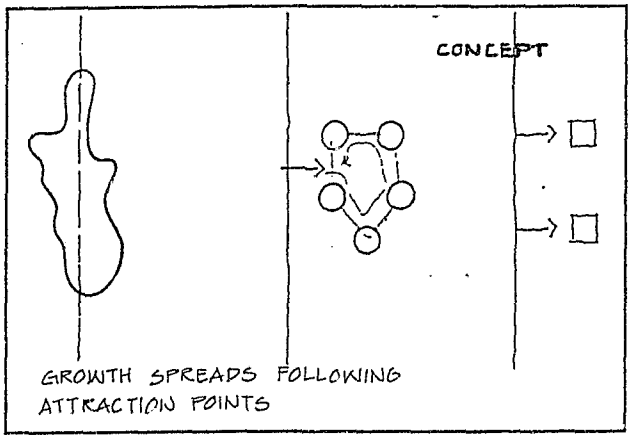


It is possible to think of Midrand in the near future grow in the direction of one or more of the scenarios outlined. Even after an exhaustive analysis it is still not realistic however to forecast a complex process like urban growth.

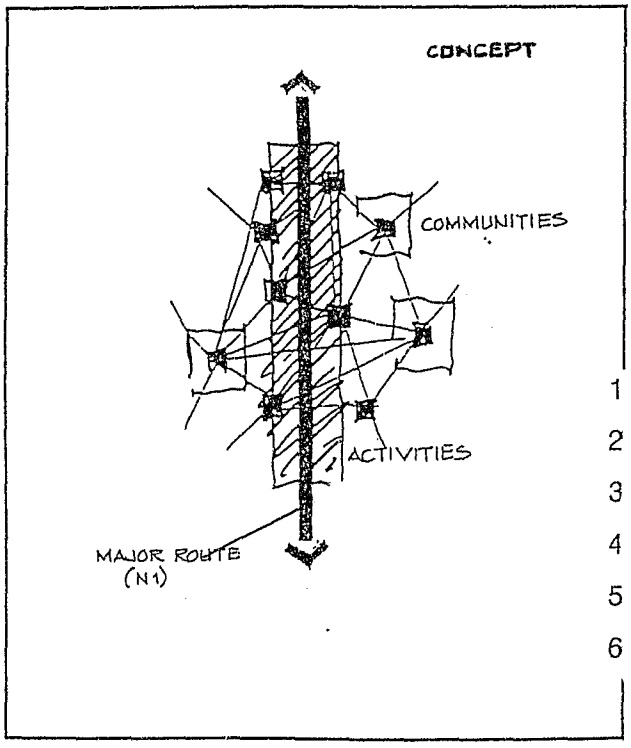
Given the present urban development trends however, it is possible to see the structural growth of Midrand take a shape that is more influenced by forces that combine scenarios B and D. It is reasonable to anticipate that the strategic location Midrand holds will continue to elevate it into an important regional center. With the significance it possesses the city will continue to be an important address for the growing hi-tech industries, offices, residence and entertainment. It will become both a destiny and a transit city. As a result it is envisioned that neighboring centers will also flourish and even new ones will start to be born around Midrand. In the future therefore, Midrand will find itself in an integrated network of cities playing its own unique significant role.



COMMUNICATION AND HUMAN INTERACTION IN THE URBAN ENVIRONMENT IS MET AT DIFFERENT LEVELS



GROWTH SPREADS FOLLOWING ATTRACTION POINTS



8.7.0 URBAN DESIGN FRAMEWORK

8.7.1 Urban design principles

From what has been analyzed in context and in general, and from the outcomes of the views of the community of Midrand, it should now be possible to derive urban design principles that will inform a development framework for the study area.

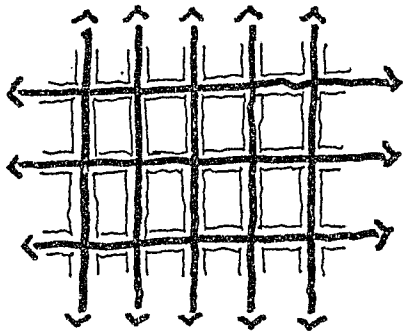
The principles should help to seek balance in meeting urban requirements. They should promote social and economic opportunities, place making, movements, information exchanges and technological developments.

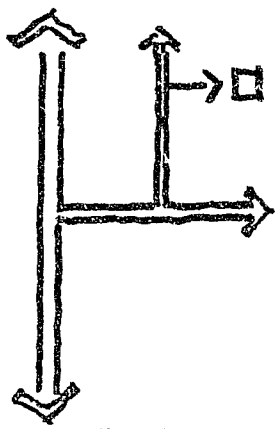
The philosophical understanding, which has been discussed in the first parts of the discourse, emphasizes human interaction and exchange to be the basis for urban existence. The principles should thus treasure these, and help to create environments that will provide adequate choices of communication.

Based on the above thinking a number of development principles, for the study area, have been derived. These are: (The sequence on list is not in hierarchy of importance)

1 Establish efficient movement systems
2 Facilitate place making
3 Create vibrant nodes along the spine
4 Make connections to other neighborhoods
5 Provide efficient public transportation network
6 Reinforce nature within the built environment

THE GRID SYSTEM PROVIDES UNLIMITED CHOICE OF MOVEMENT.





THE HIERARCHY PROVIDES CONTROLLED MOVEMENT SYSTEM.

8.7.2 Applying the principles

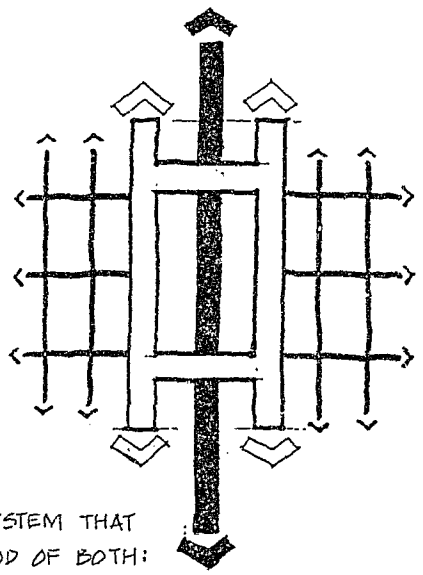
1. ESTABLISH EFFICIENT MOVEMENT SYSTEMS

The discourse has emphasized the importance of mobility associating it to technological developments. MDF, (1996) on the other hand also reminds us that cities are movement economies, and that increased movement means increased development potential, increased economic potential, and increased opportunity for social interaction, and community integration.

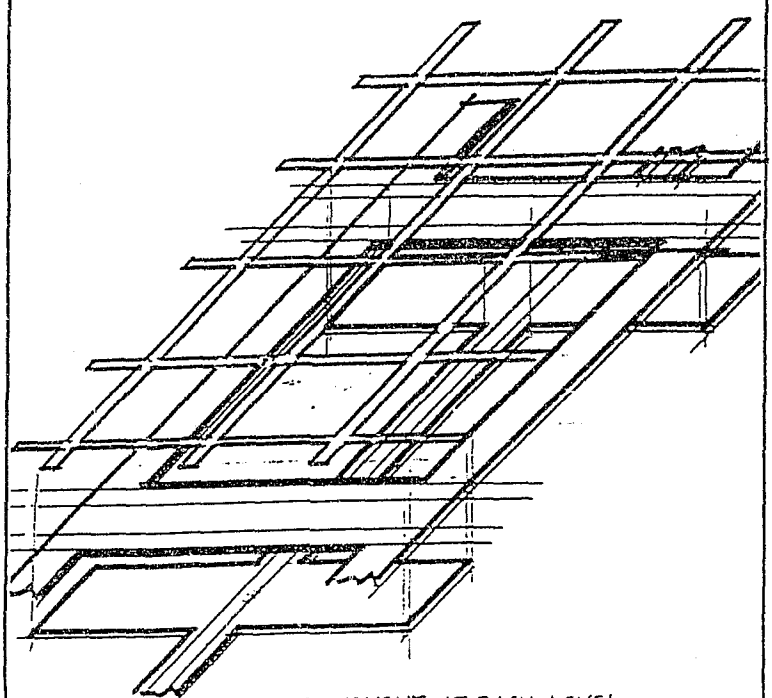
To enable this, Midrand requires more efficient movement routes and connections. The N1 and Old Pretoria Road (in the study area) together with Moddernfontein/Alan Road, the K71, and the R511, ensure good North-South connections. However there are few East-West links, and this coupled with the Midrand Activity Strip (the study area) physically dividing the city into two halves, makes the East West connections of the city very weak.

In order to address this issue, the applicability of two alternative connections, the grid and hierarchy of movement systems, are compared.

For urban environments to promote interaction and exchange socially, economically and culturally, it is



DEPLOY A SYSTEM THAT HAS THE GOOD OF BOTH: THE GRID, THE HIERARCHY



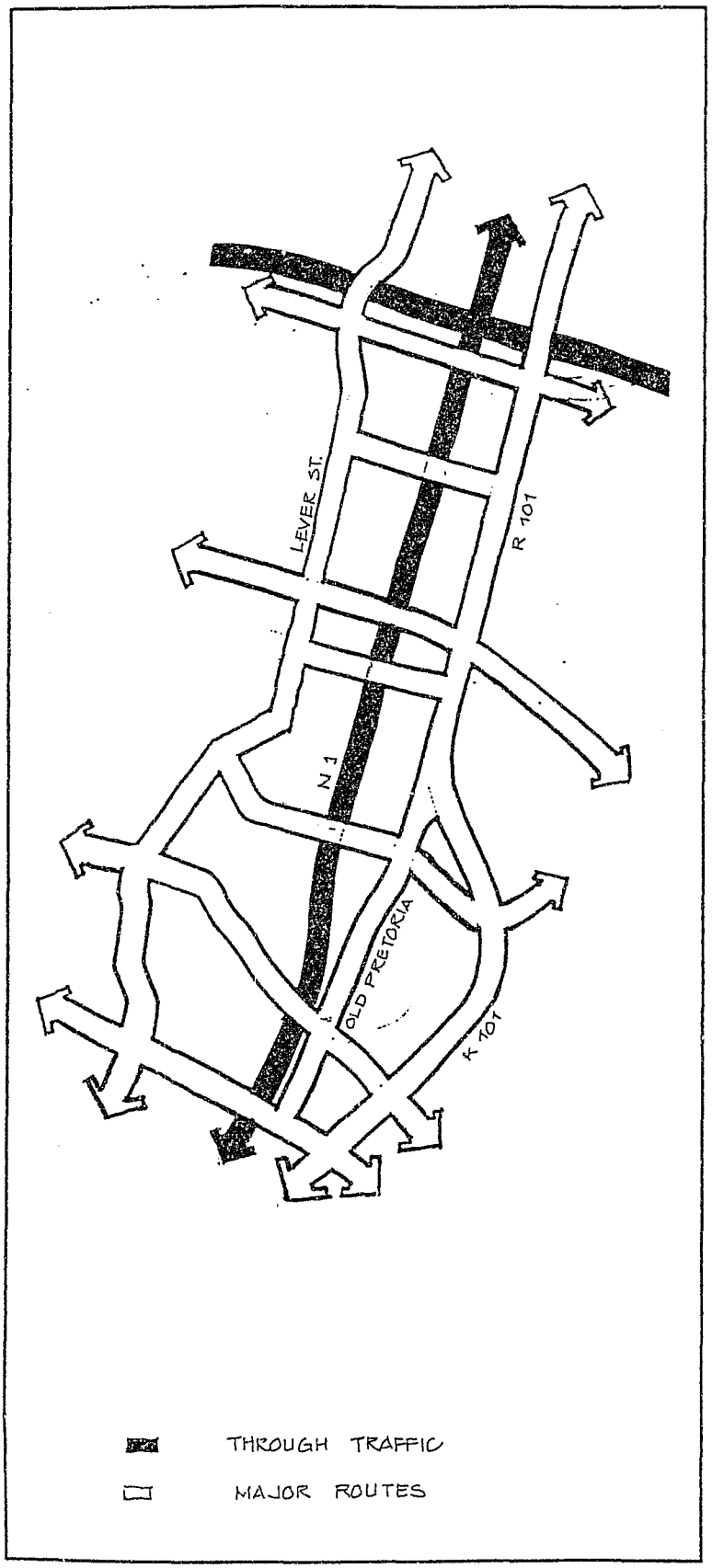
MOVEMENT, AT EACH LEVEL SHOULD WORK EFFICIENTLY

- PEDESTRIAN
- LOCAL COLLECTORS
- MAIN ROADS
- THROUGH TRAFFIC

important that they provide choice and a wide range of possibilities. The grid is known to give better choice of movement for people about the city. It is described to be a more `democratic' urban form. Pedestrians and motorized traffic can easily disperse. The grid is advantageous in that it provides more alternatives. On the other hand, the grid is less favorable to the hierarchy system if imposed on wrong places.

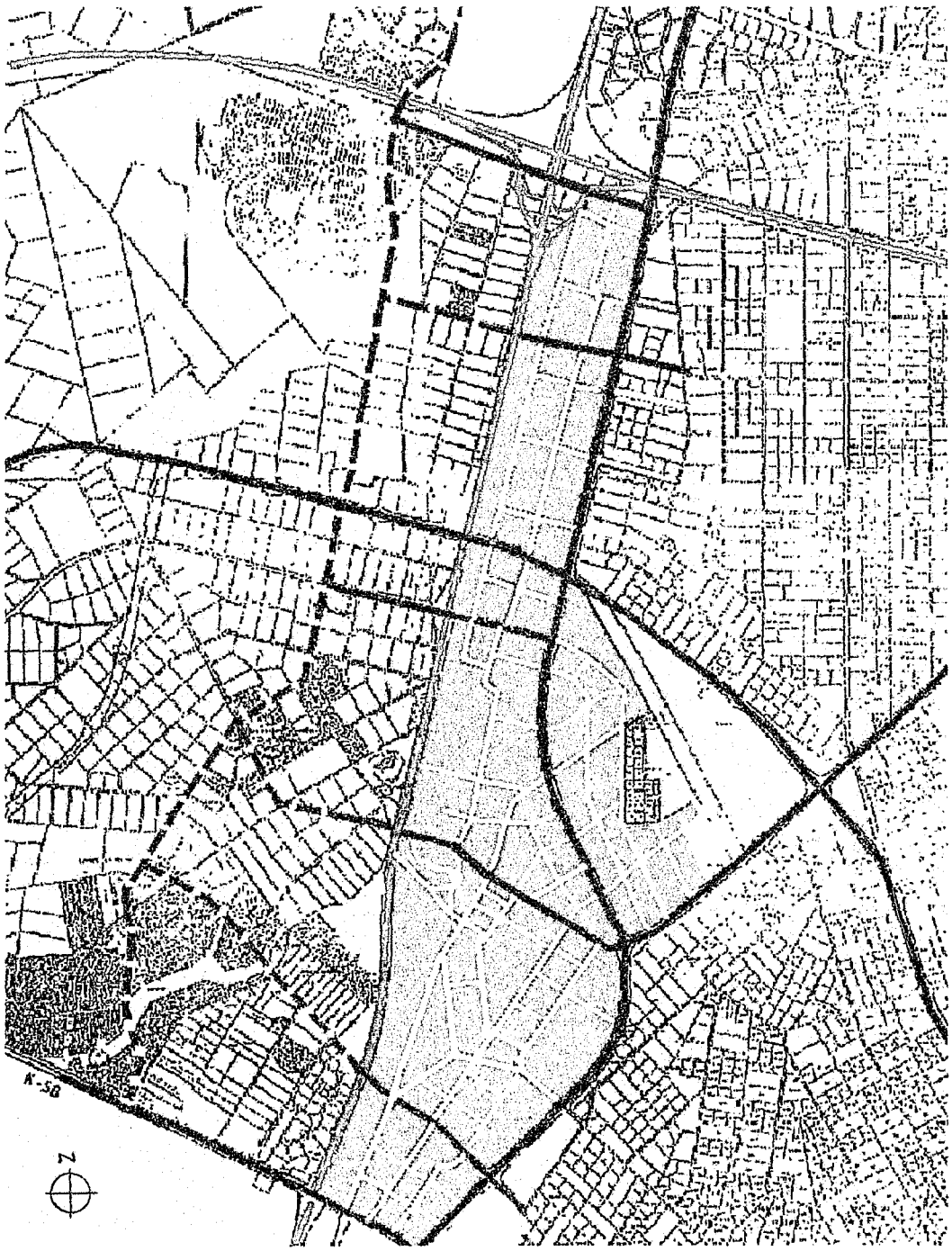
The hierarchy of movement systems allows a more controlled and directive movement structure. It is useful to encourage certain routes and limit other movements. With this structure it is possible to achieve clarity in the ordering of urban elements and movements. It is also possible to manage through traffic without interfering with other day to day local traffics and pedestrians.

Midrand's layout can benefit from the good of both systems. An integrated system of movements, that combines the grid and the hierarchy, is utilized to respond to the peculiar nature of Midrand's growth. The grid system of connections is necessary at local collectors' level. These provide users with a safer environment, improved access, and public transport routes. As connections go to the higher levels (e g. arterial routes) the grid structure gets less fine, while still maintaining the permeability of the urban structure. Free ways will make the top of the hierarchy,



being accessed only at limited points from main arterial roads.

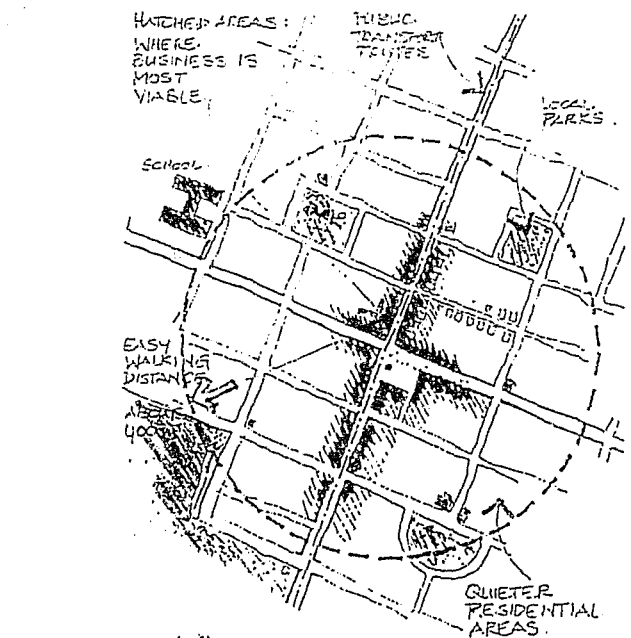
The drawing shows a layout of a movement system for Midrand Strip based on the above. The Ben Schoeman highway and other proposed routes (K27) will be approached mainly from the entrance points of the city. The K101 Old Pretoria Road will form the main arterial connection on the North-South direction. It is suggested that, the above North-South movement is to be supported, on the west, by evolving Lever Street into a similar capacity route. The two are then reinforced with a number of East-West connections (Allandale, Le Rooux, Church/Dale, George, and Olifantsfontein). The other smaller routes will form part of the grid movement systems that will feed the above streets at different levels.

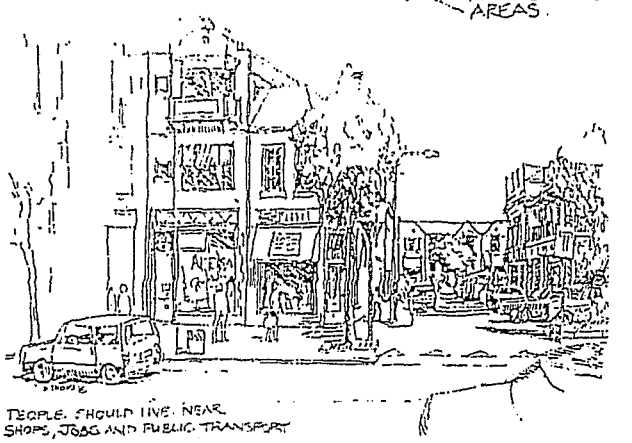


DEVELOPMENT FRAMEWORK

MOVEMENTS

- Freeways
- Major roads
- Possible main road connections
- Collector roads
- Proposed collector roads





MIDRAND DEVELOPMENT FRAMEWORK

URBAN SOLUTIONS
Architects & Urban Designers

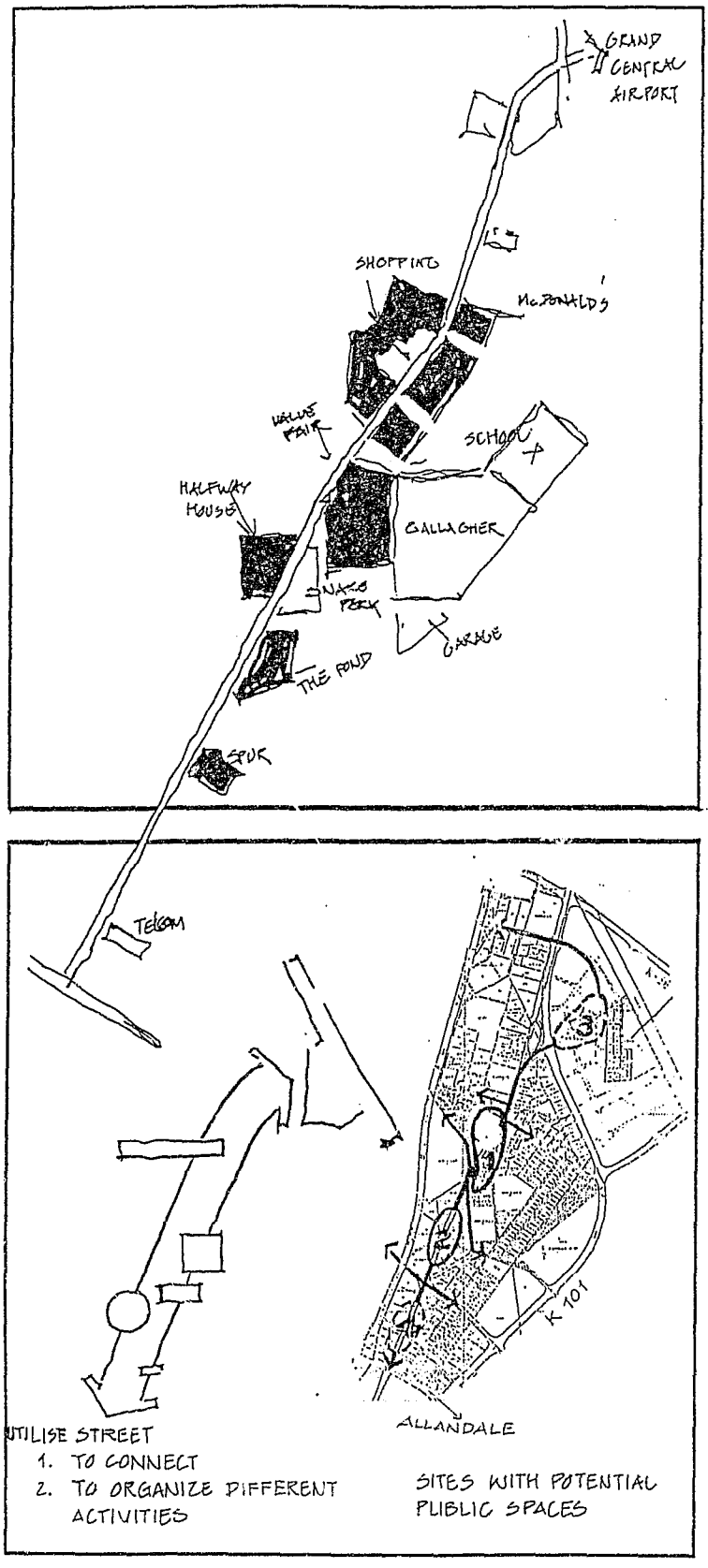
2. FACILITATE PLACE MAKING

"Cities were invented to facilitate exchange of information, friendship, material goods, culture, knowledge, insight, skills and also exchange of emotional, psychological and spiritual support. For a truly sustainable environment, we need to maximize this exchange, whilst minimizing the travel necessary to do it." (Engwicht, in MDF 1996)

As shown in MDF (1996), the people of Midrand perceive the necessity of integrating and mixing of land uses as a requirement and a priority. Promoting mixed land use, as opposed to the zoned and separated land uses observed in Midrand, is clearly advantageous to the people of Midrand in solving the number of problems identified by the communities. (crime, reduced access, lack of city integration, no 24 hour use of areas, etc)

There is no better place than the public realm to bring out such qualities of the city. It will therefore be important to consider the making of the Street into a place where all users needs are balanced.

It is hence thought useful to promote the evolvement of a place that has the outlined qualities, in the study area.



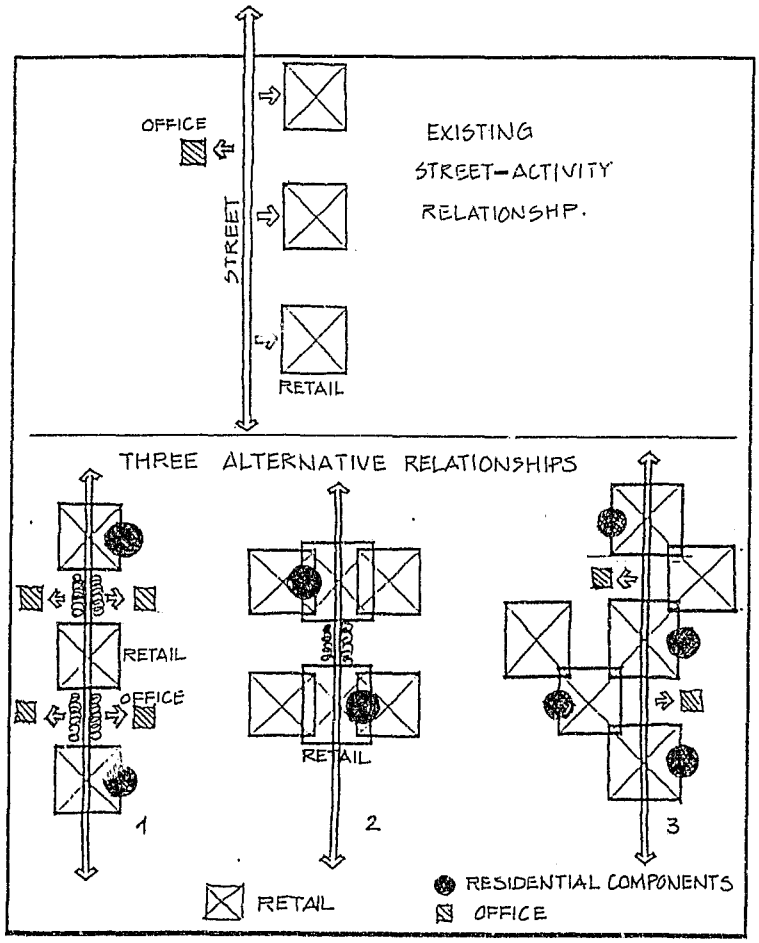
The site:

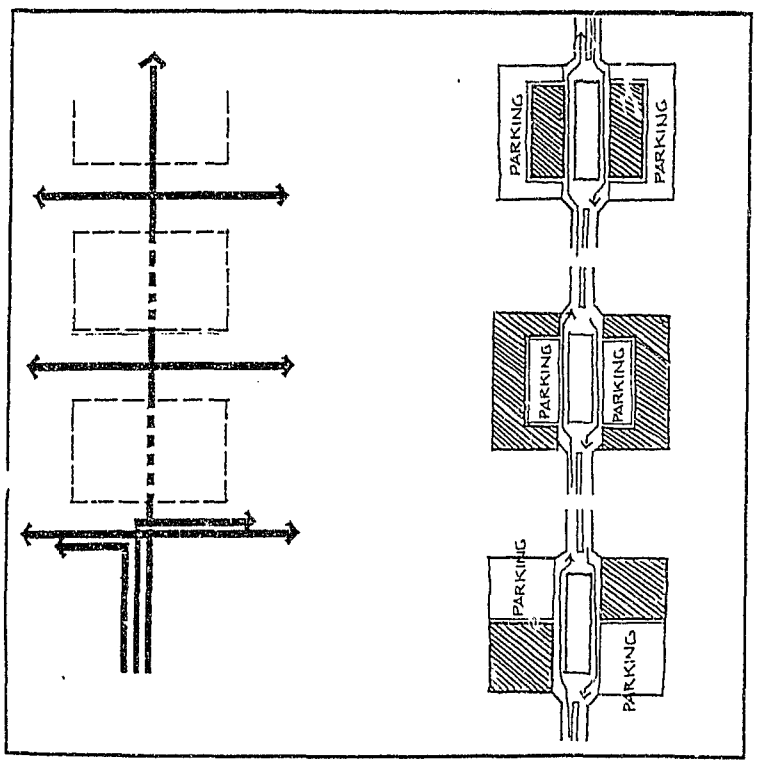
A area with an already evolving activity, which can possibly be turned into people's street, is identified on Old Pretoria Road. The existing character of the street is shown in context and in detail. At present, this street lacks a continuous character. It contains some shopping activity areas that are developing on the sides in certain parts. Other parts of it look quite underutilized plain and underutilized. It is not pedestrian friendly, and boasts of few trees and greens.

Quality to be promoted:

The street can be revitalized into a vibrant 24hour people's place by mixing and integrating different activities. With land now made available in this part of the strip, (by concentrating around the gateways those activities that have less to do with Midrand's community) it is now possible to introduce mix of activities that comprise of:

-Residential
-Retail (includes hawkers)
-Offices
-Entertainment
-Green spaces



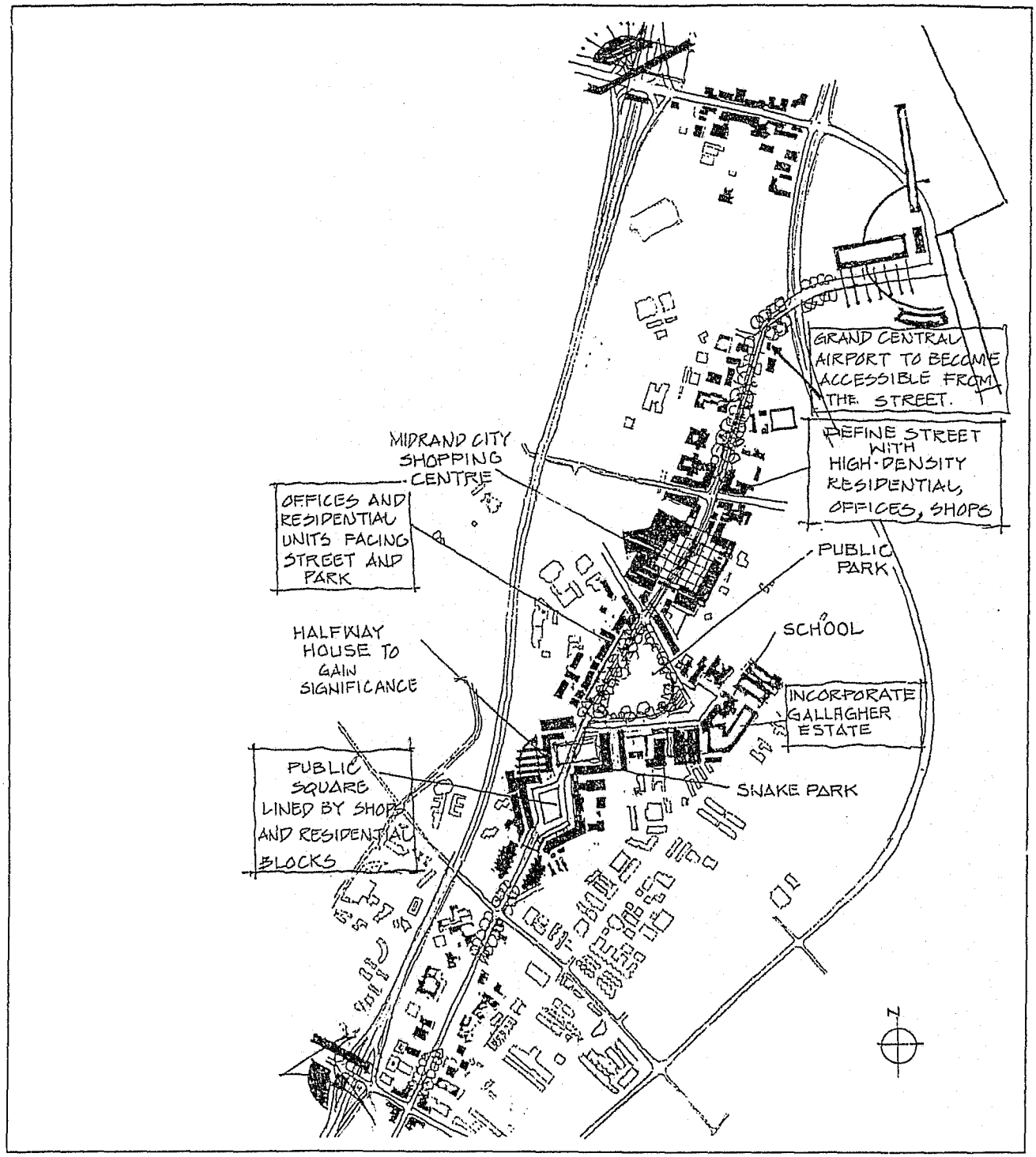


Character:

The street is to be treated as an ordering element around which different urban elements are organized. It would evolve its own character with commercial concentrations taking shape on the sides and even above it at determined locations. The locations repeat themselves creating necks of green streets lined with shady trees. High-density residential occupations and offices would develop incrementally on the sides of street, and on the upper floors of the street level.

Traffic:

Traffic is managed in such a way as to prioritize the pedestrians while still maintaining the drive through and local movements of motorized traffic. It is important to allow these to exist together in a complementary way and without disadvantaging the other. Multi level movement systems and b' dging at places need to be encouraged where necessary. Parking spaces are to be provided on sides of street, behind or under structures. The movements would include public and private transports, and pedestrians.

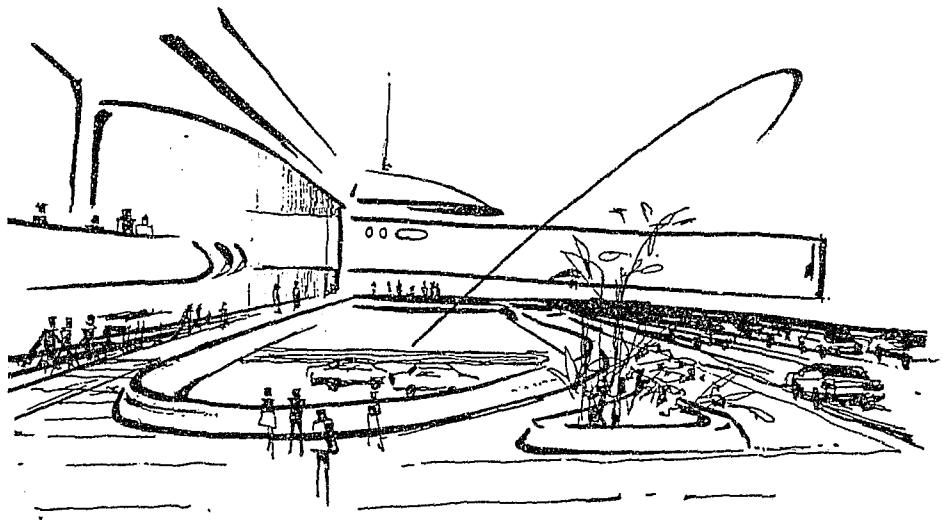


DEVELOPMENT FRAMEWORK

PLACE MAKING

- MIXED USE BUILDINGS DEFINING PEOPLES' PLACES
- EXISTING OFFICES AND INDUSTRIAL BLOCKS IN PROXIMITY

3. CREATE VIBRANT NODES ALONG SPINE

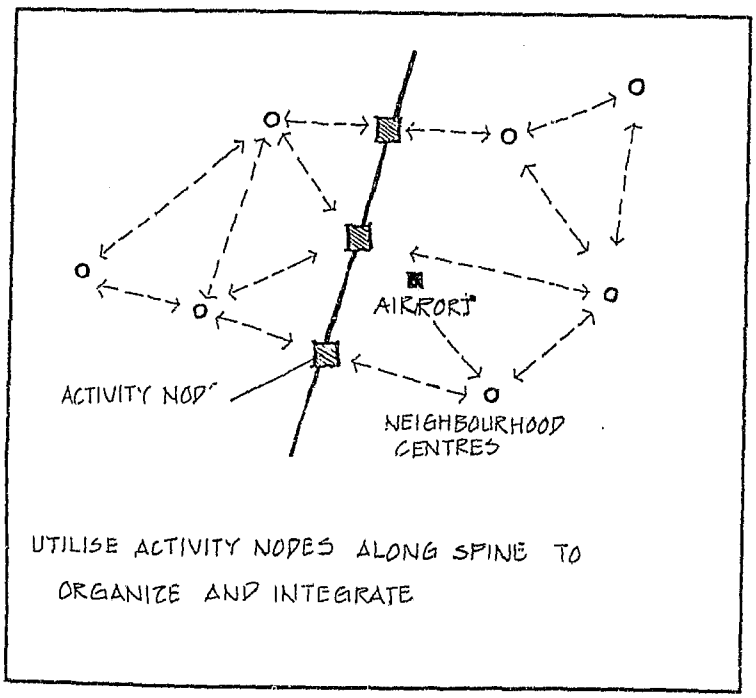


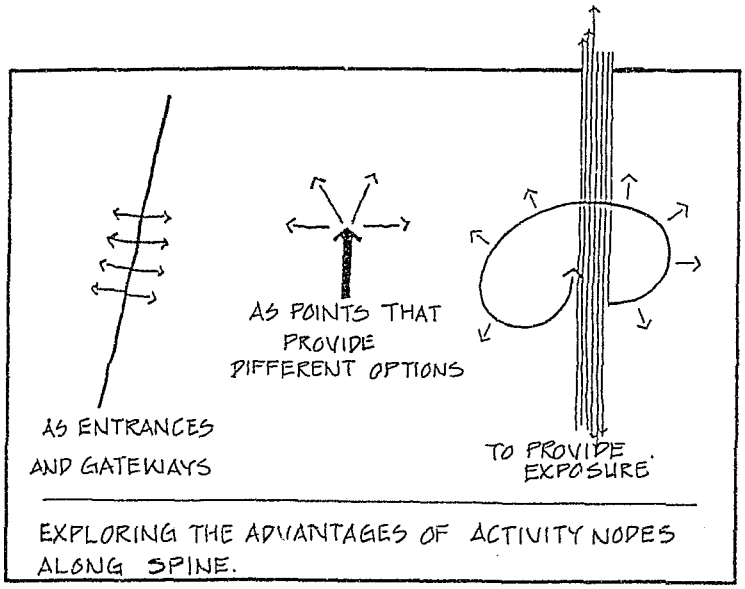
These centers will serve:

-to integrate the fragmented developments that are taking place in Midrand by acting as core ordering elements of the city. The centers will become visual, structural and functional landmarks of the area.

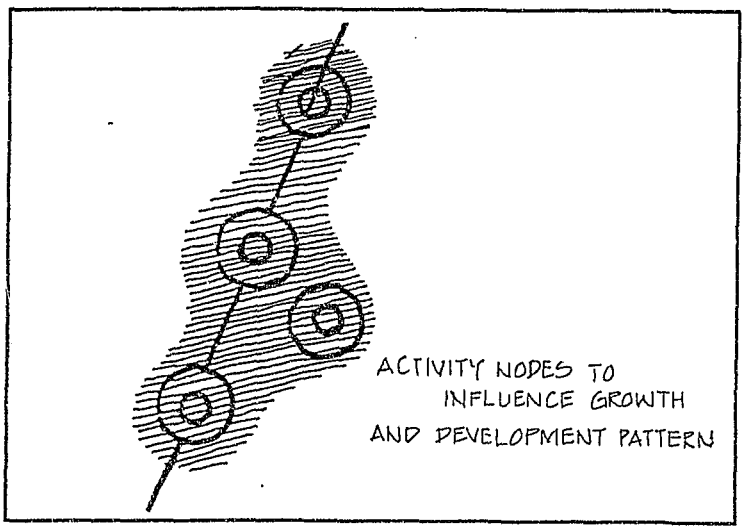
-to organize different activities and land uses around fixed centers, in which different utilitarian options are available (retail, entertainment, transportation nodes, service facilities, etc).

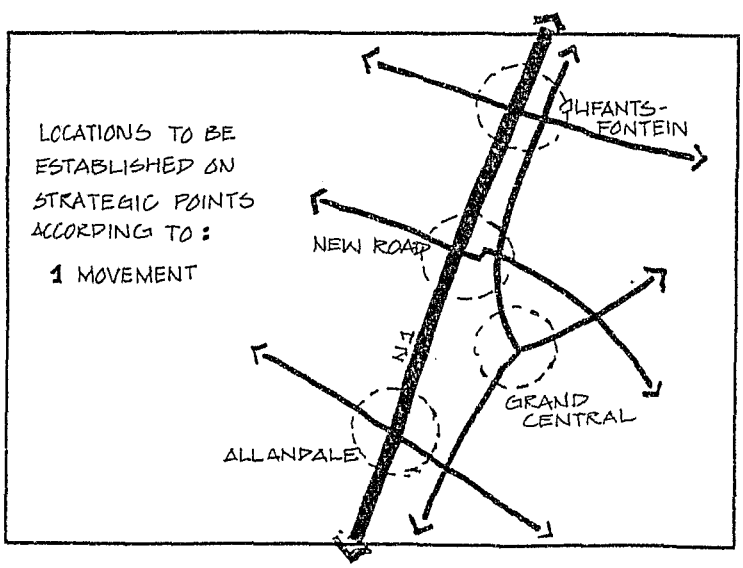
-to concentrate certain activities of the city (such as hi-tech industrial and entertainment), whose services are not limited to Midrand, closer to the gateways. This will free other strategic





EXPLORING THE ADVANTAGES OF ACTIVITY NODES ALONG SPINE.





locations of the city from private occupations and makes them available for other benefits of the city.

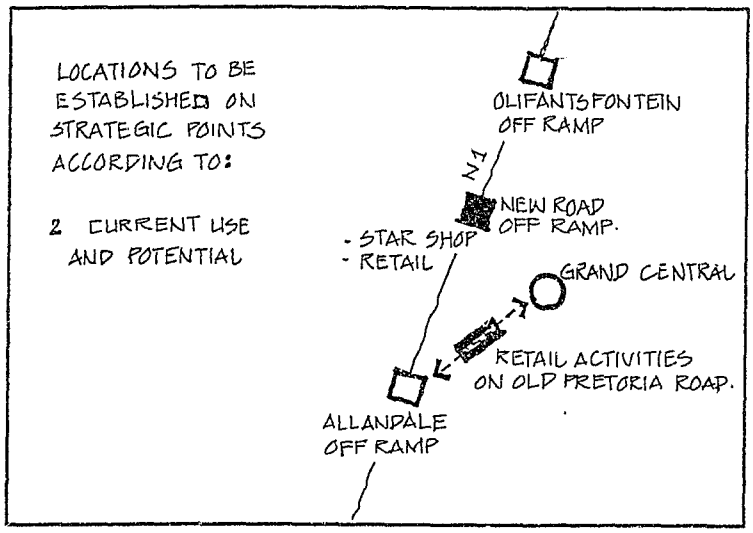
-to articulate the main entrances and exits of the city in a more significant way. Such celebrated gateways will communicate an important image of Midrand, which, in the near future, is likely to be associated with the hi-tech developments increasingly occurring in the area.

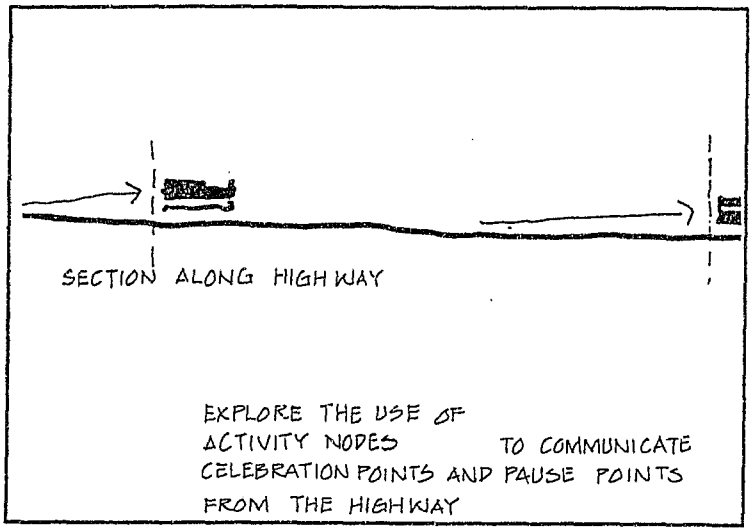
-to provide a number of social and economic opportunities to Midrand residents. With the growing importance of such activity nodes at a regional level, Midrand's exposure to the outside will increase, to the benefit of local Midrand people and residents of nearby settlements.

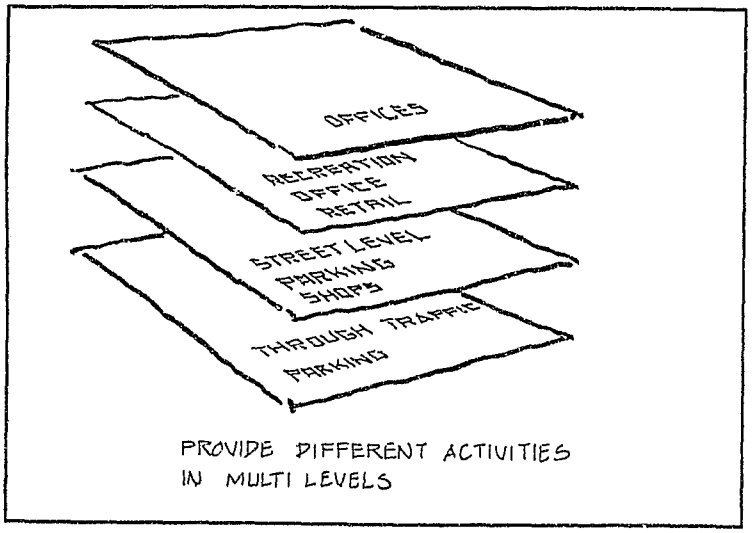
The centers will provide:

Various options to pedestrians as well as motor users by containing different facilities and activities as:

-commercial and industrial
-offices
-entertainment and recreational
-different transport facilities, to locations within and outside Midrand (includes transit from different modes of transportation).







Their locations:

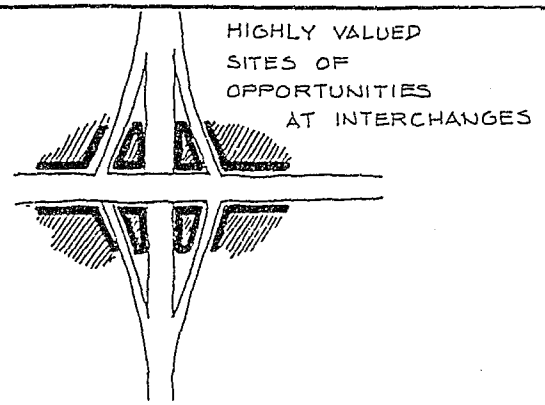
The locations of these activity nodes would be decided based on what is already there and what might also happen in the future. The choice of sits for such developments must consider utilizing the existing expensive infrastructure and natural environment in a resource efficient way. Newly occurring activity locations (e g. Star Shop), important crossroads and off-ramp areas, and The Grand Central Airport are therefore considered in this proposal.

Their design:

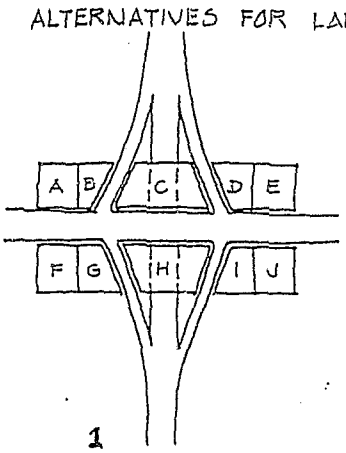
The design of these centers is to consider multi-level planes where the different horizontal levels are physically and visually connected to each other. They would be easily accessible to and from other levels and every part of the city. Each level would represent a certain activity (to be fixed in close reference to the context of the specific center). In general, the relationships of different groups of levels would look as shown.

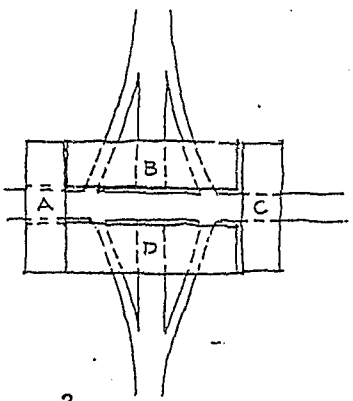
Land lease:

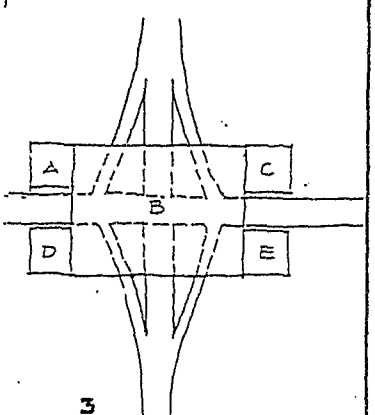
Land in these locations would be leased in such a way as to promote such integrated developments. Sites on opposite sides, and/or corners of

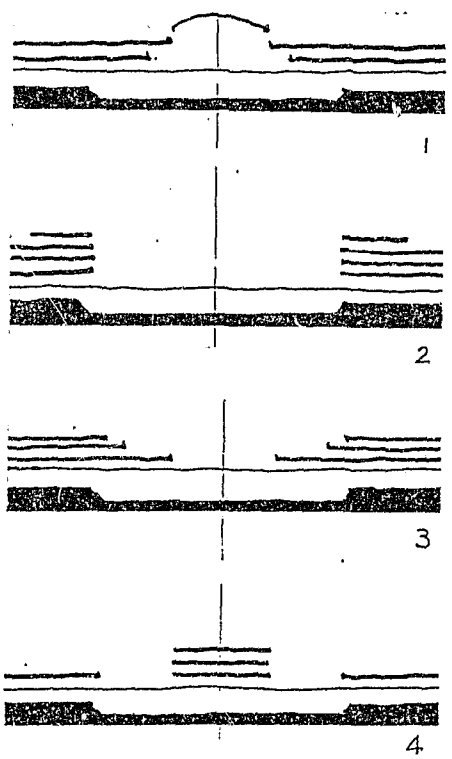


roads would be leased out as one, and encourage their coherent developments without interrupting through movements and other requirements of the city.







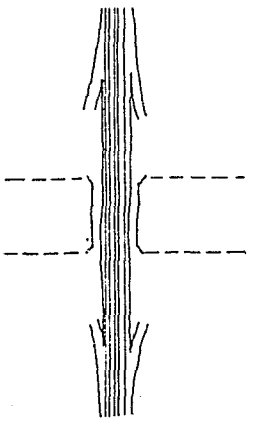


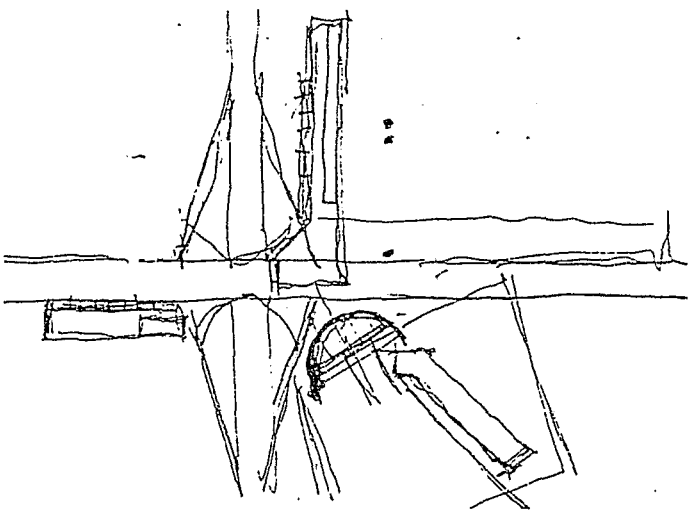
FOUR ALTERNATIVES FOR STREET SECTIONS.

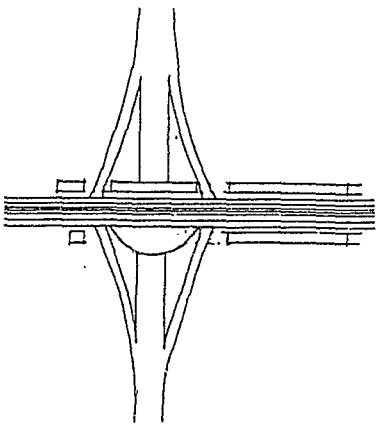
UTILISE ACTIVITY NODES TO COMMUNICATE IMAGE ARCHITECTURALLY

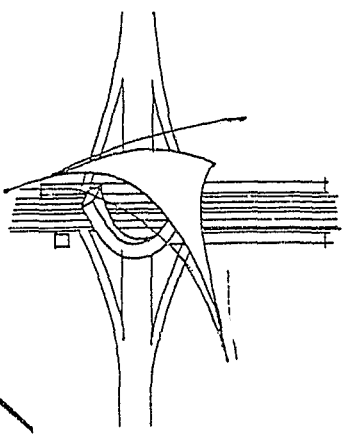


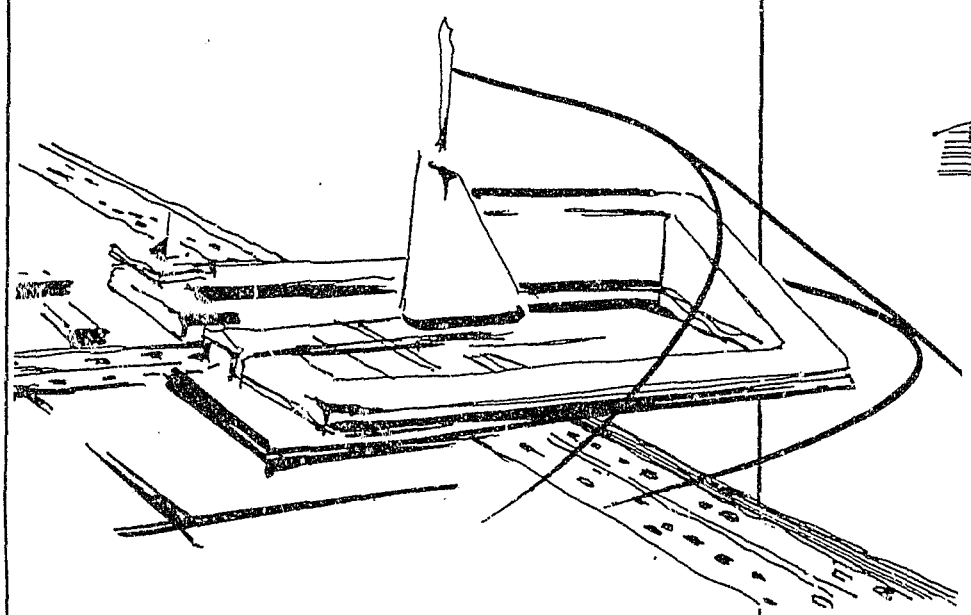
SECTION : N1



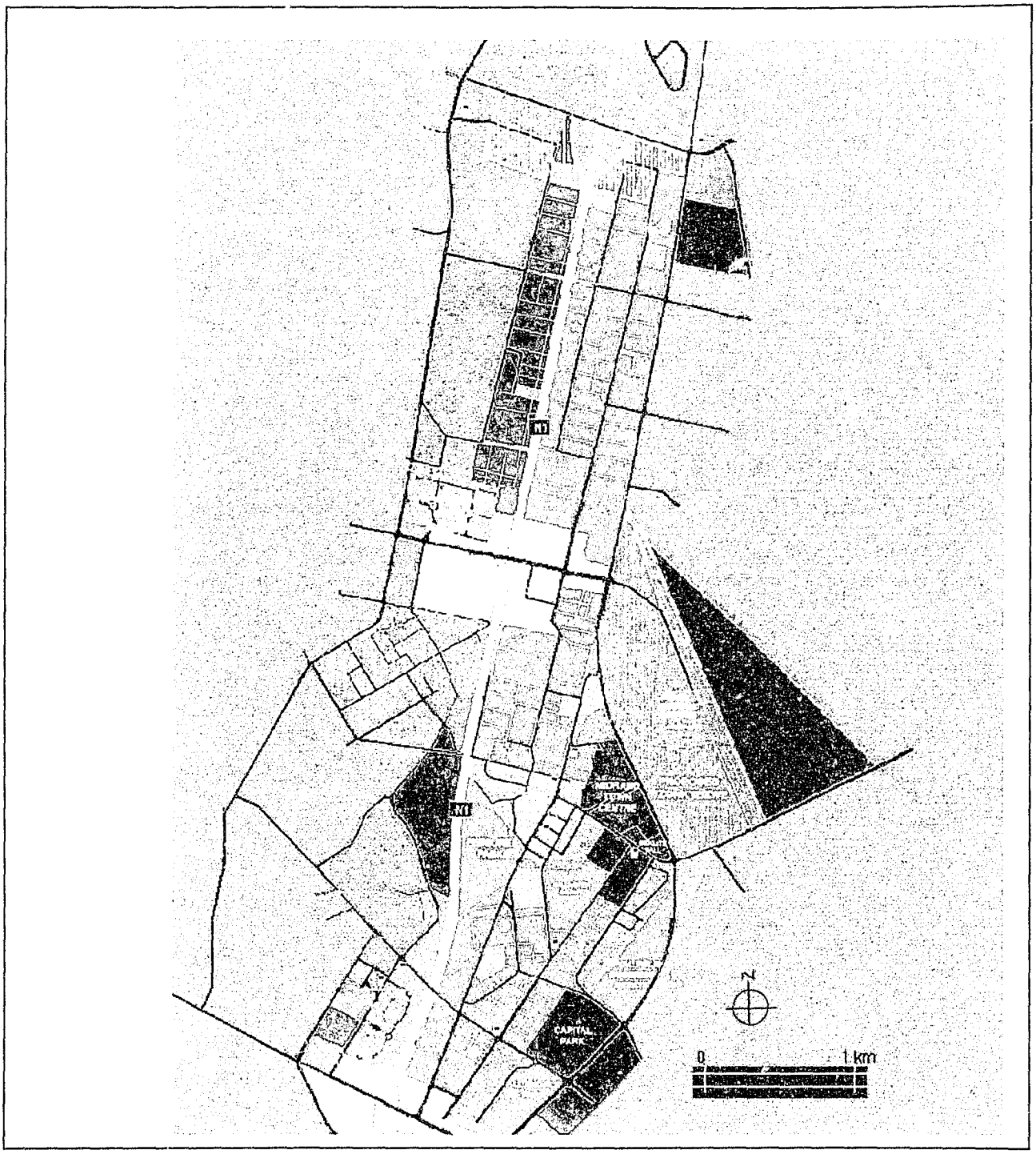








PLAN: THRE DIFFERENT LEVELS



DEVELOPMENT FRAMEWORK

ACTIVITY NODES

PROPOSED

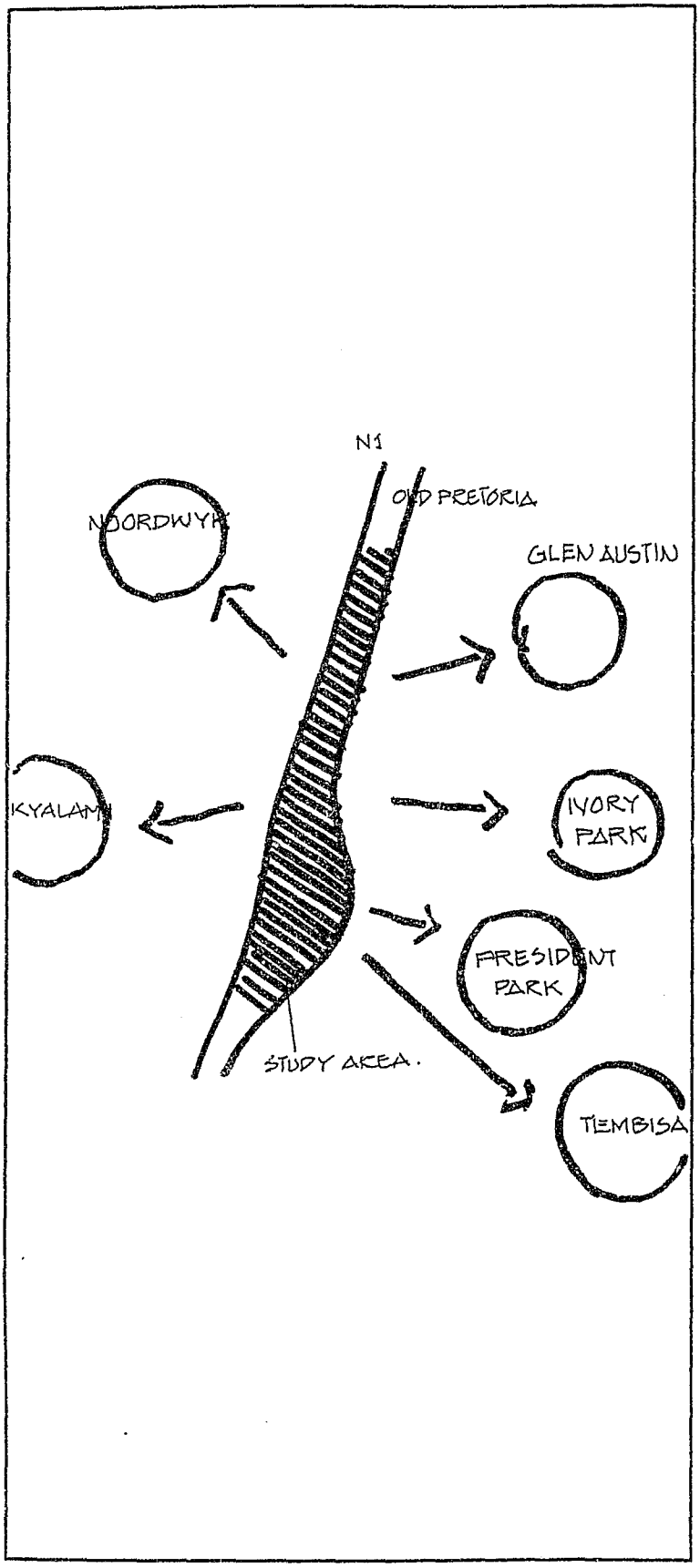
- NODAL ACTIVITIES
- POSSIBLE FUTURE NODE DEVELOPMENT

EXISTING

- INDUSTRIAL /HI-TECH
- OFFICE
- RETAIL

DEVELOPMENTS

- INDUSTRIAL /HI-TECH
- OFFICE
- RETAIL



4. MAKE CONNECTIONS TO OTHER NEIGHBORHOODS

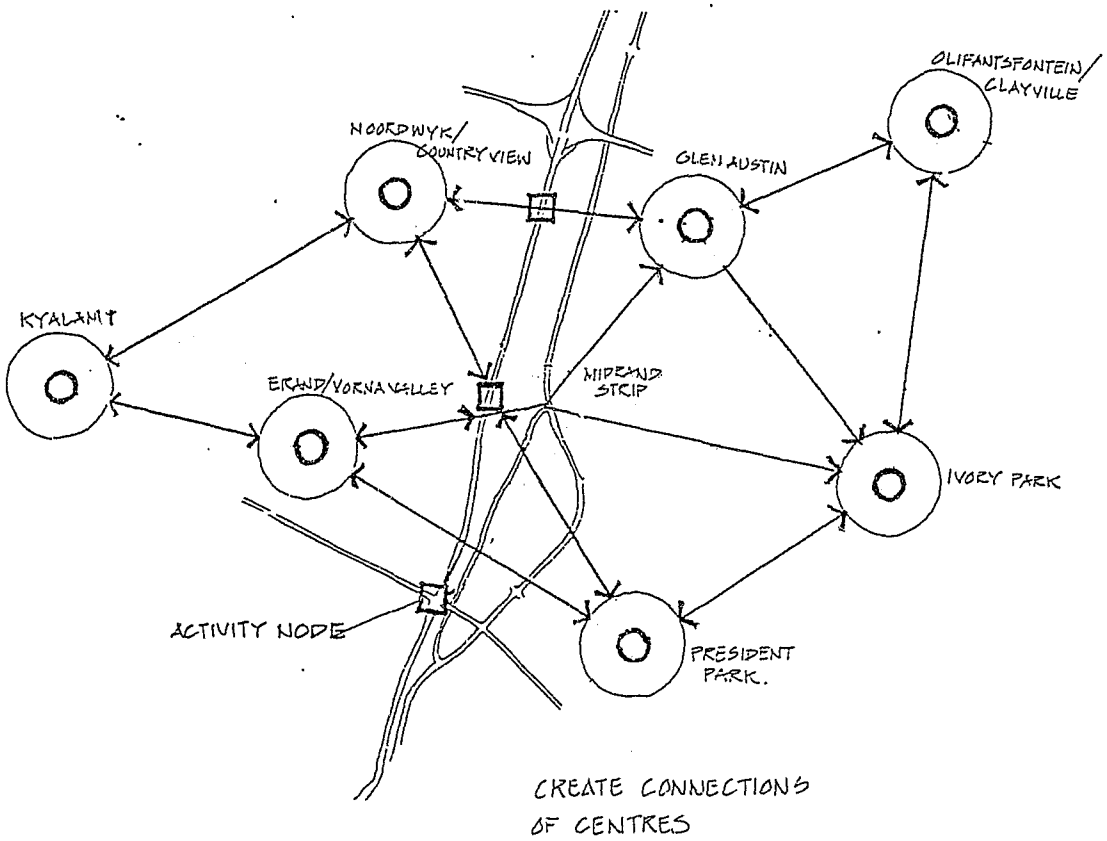
" If Midrand is to become the model of a new South African city where economical and racial separation is removed, then the spatial connections to facilitate the integration of formerly separate communities must be made." (MDF 1996)

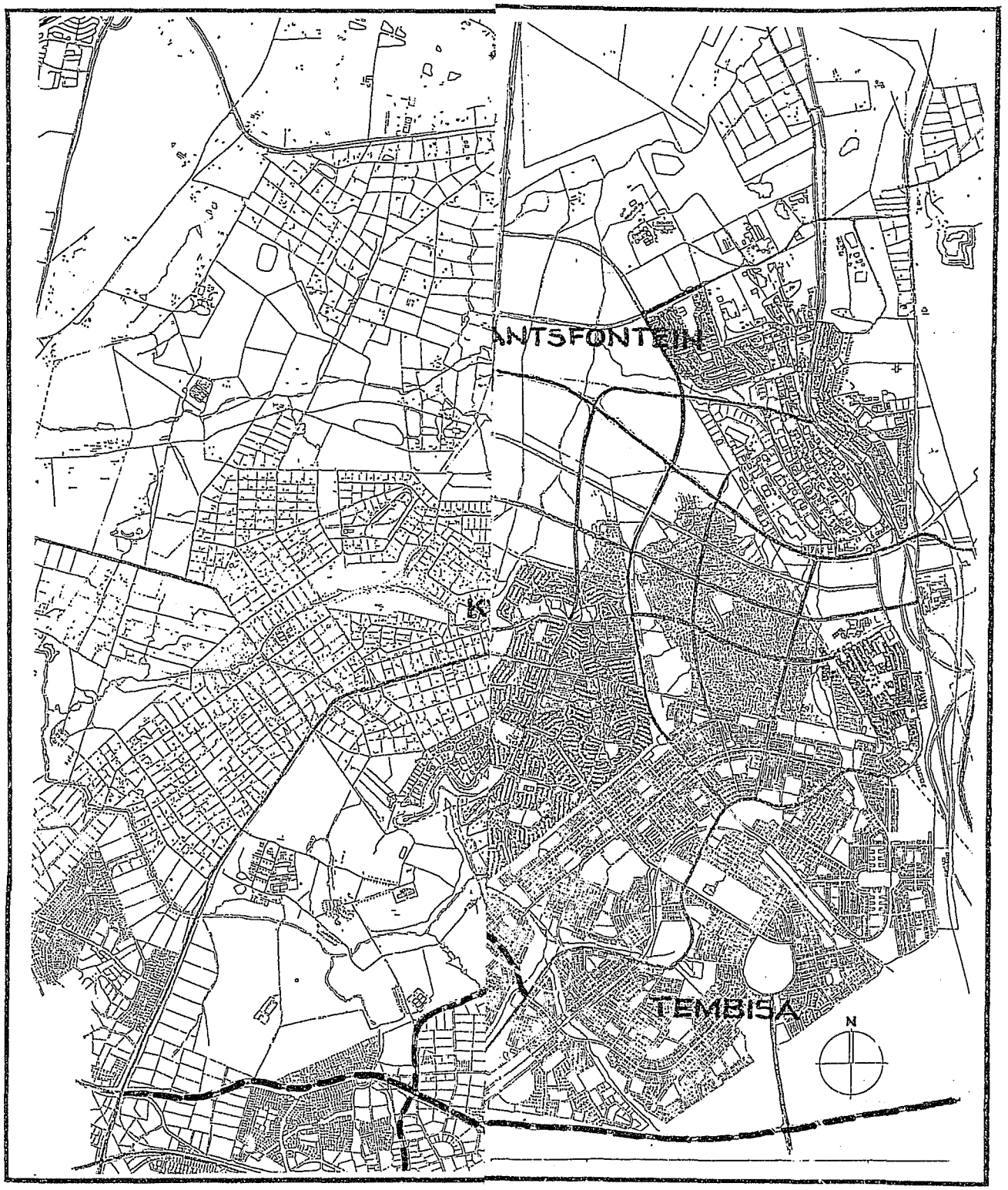
It has been indicated that Midrand is composed of disparate parts. Each part reflects its neighborhood or community identity with few coherence to the whole. Hence in order to bring an integrated development, stronger connections between these must be thought.

MDF (1996)indicates the need that exists to link the majority of population, residing in Ivory park, with placed of social and economic opportunity that is available in Midrand Town Center, Olifantsfontein, and Kempton Park. As here identified, it is a key intervention to make these connections.

Most of these areas exist outside the study area. However in providing a framework for the strip, it is found necessary to consider the entire Midrand area's development potential, economic, and opportunity for social interaction and community integration, and their influences on the study area.

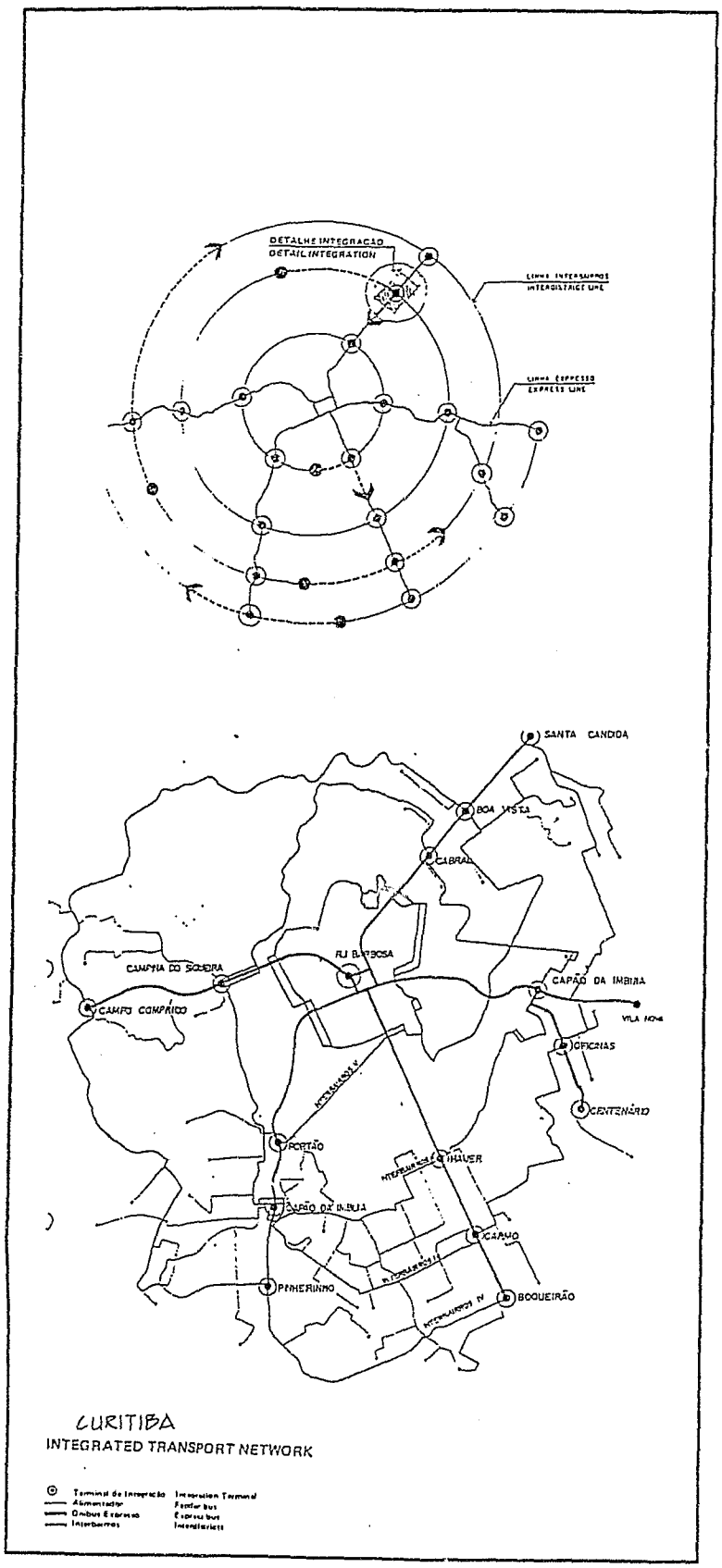
Parallel to the development of activity centers, it is therefore thought crucial to look at the connections of these communities to each other and to Midrand strip. The pattern can form a web of connections linking centers of neighborhoods and activity nodes. These should dissolve as one in the linearly organized development of activity nodes, adding to the unique structural quality of Midrand.





DEVELOPMENT FRAMEWORK

CONNECTIONS



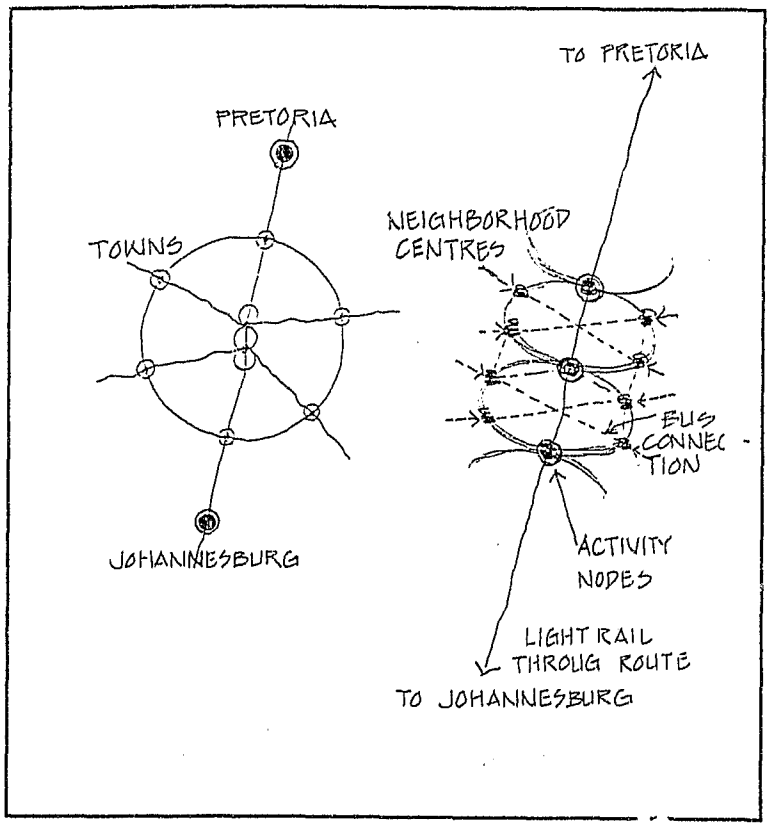
5. PROVIDE EFFICIENT PUBLIC TRANSPORTATION NETWORK

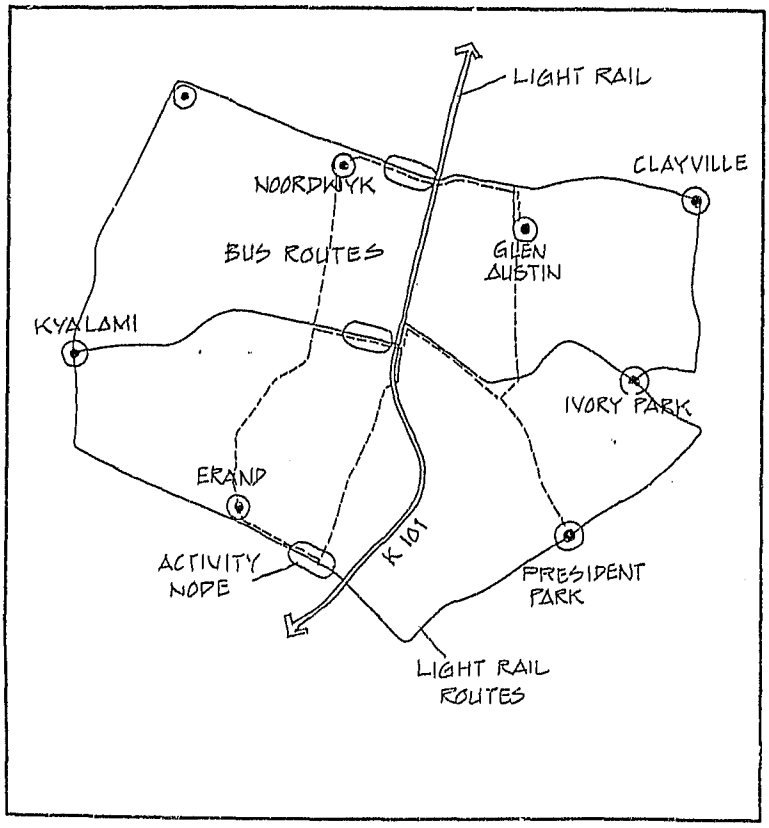
Midrand is known to suit best the private, motorized movements. It is less friendly and accessible to users who do not own private transportation. On the other hand, it is also shown that 80% of Midrand's population (includes adjacent communities) is denied of private transportation.

It is important to consider the priorities of this section of urban users. The provision of an efficient public transportation system would thus be necessary to make Midrand more accessible to the majority of the communities. This means that Midrand should have interconnections within the city, and also be connected to other cities and towns with public transportation network.

Five minutes walking (400m) is what is defined as a reasonable distance, thus public transport routes must be accessible within this range.

A lesson from Curitiba, Brazil is employed to bring out the good of an integrated network. Curitiba has no light rail system, and car ownership is among the highest at 300 cars per 1000 population (av. Of 100 cars per 1000 population in South Africa according to Urban Age, Autumn 1998), and yet 70% of its urban

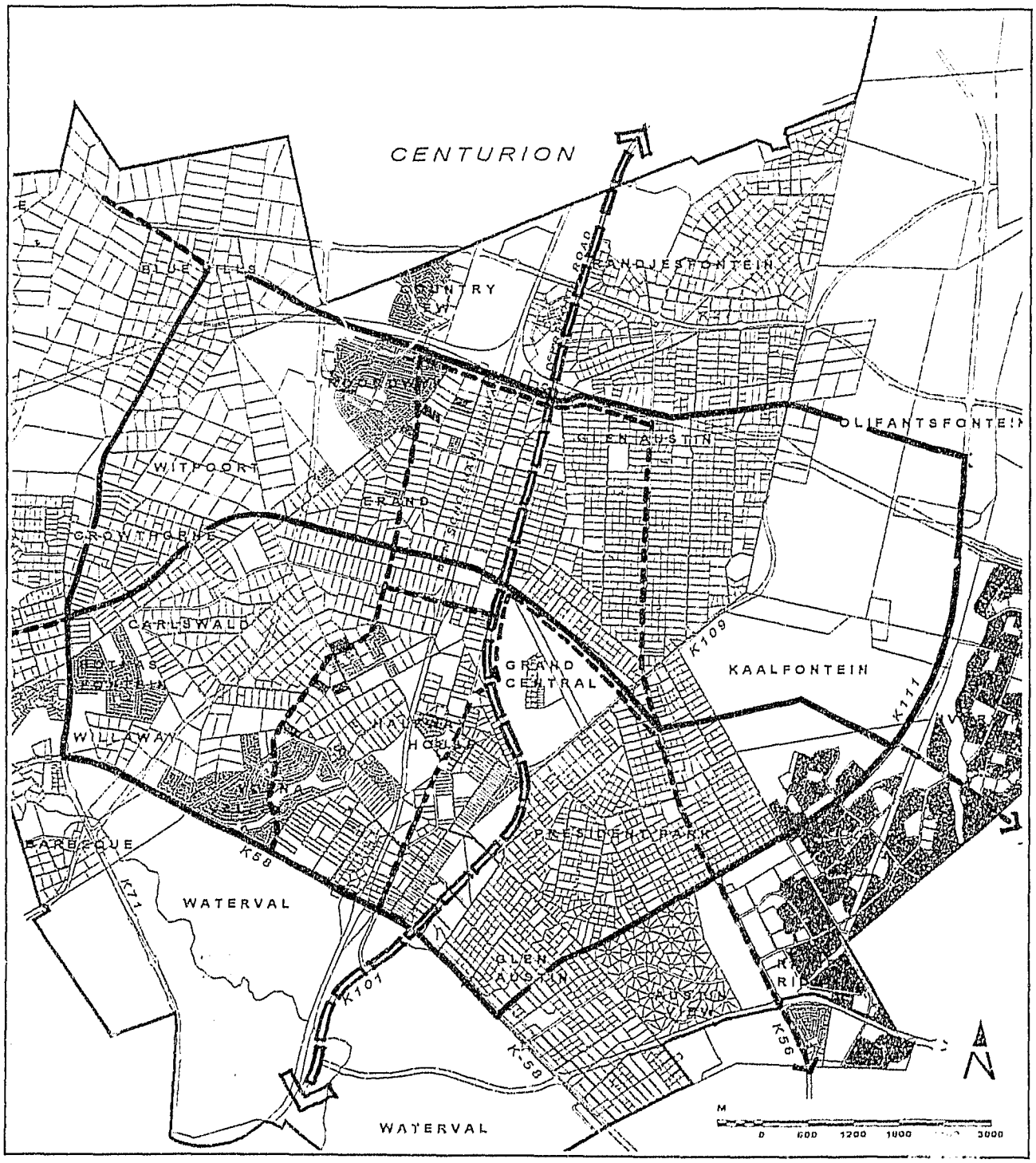




transport trips are undertaken by public transport, 20% by private cars, and 10% by either bicycle or walking. This high public transport modal share has been achieved over a period of some 20 years, by the development of an efficient, attractive and affordable network of bus services (Strybis 1994). The bus system utilizes an integrated network that includes express, inter-district and feeder bus services. In addition, there is a conventional bus service which links the districts directly to the city center and a small city center service, neither of which form part of the integrated system.

Such a model can be interpreted into Midrand's context, and be utilized to address the public transportation demand highlighted.

The framework therefore proposes an integrated network of public transportation movement system that links Midrand strip to local destinations and to the region. The system will include light rail and bus routes to work in integration. Thus the diagrams show the connection of points achieved by this system at the two different levels.



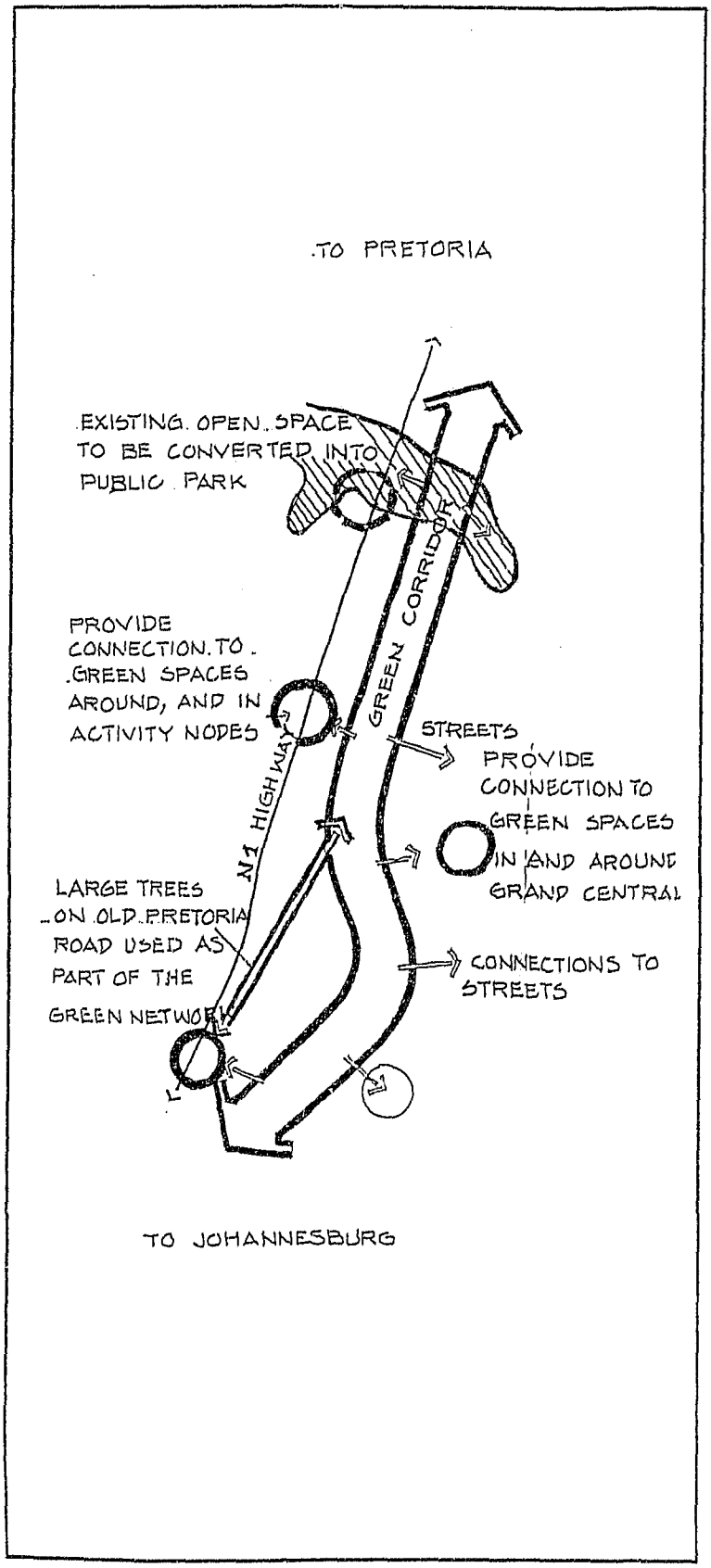
DEVELOPMENT FRAMEWORK

PUBLIC TRANSPORTATION

REGIONAL LIGHT RAIL SYSTEM

LOCAL LIGHT RAIL ROUTES

BUS ROUTES



6. REINFORCE NATURE WITHIN THE BUILT ENVIRONMENT

The diversity and efficiency of its elements enrich the quality of urban environments. Urban green open spaces are among the major contributors to this. Their use extends from utilitarian (such as recreational, social activities, traffic islands, etc) to psychological (such as visual relief from congested urban structures and activities). Therefore it is crucial that these spaces are kept as accessible as possible to people

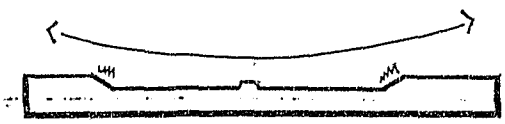
Urban green is not only expressed in parks. Streets, paths and outdoor activity areas can contribute to the richness of nature in the urban environment.

Low density and availability of vast open spaces in Midrand is an opportunity for readily promoting nature in the environment. The fine old trees that are identified along Old Pretoria Road are potentially contributing if preserved and incorporated into the general structure.

In promoting the outlined principle the framework presents the treatment of Old Pretoria Road as an urban green corridor.

Lined with large trees, this road as an element would serve to richly organize

other recreational green spaces and different urban activities in a reasonable continuity. This arrangement is also believed to add to the richness of ones ability to orientate oneself in the city.

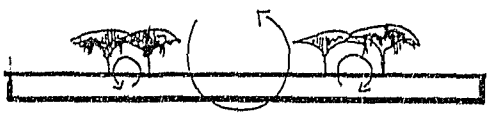


FREEWAYS

The following three different levels of street sections can be obtained:

-Freeways (e g Ben Schoeman Highway)

As there are no sidewalks, the sides are to be treated with lawn finishes, no obstructive trees



MAJOR ROADS

-Main roads (e g Old Pretoria Road)

Preserve old trees.

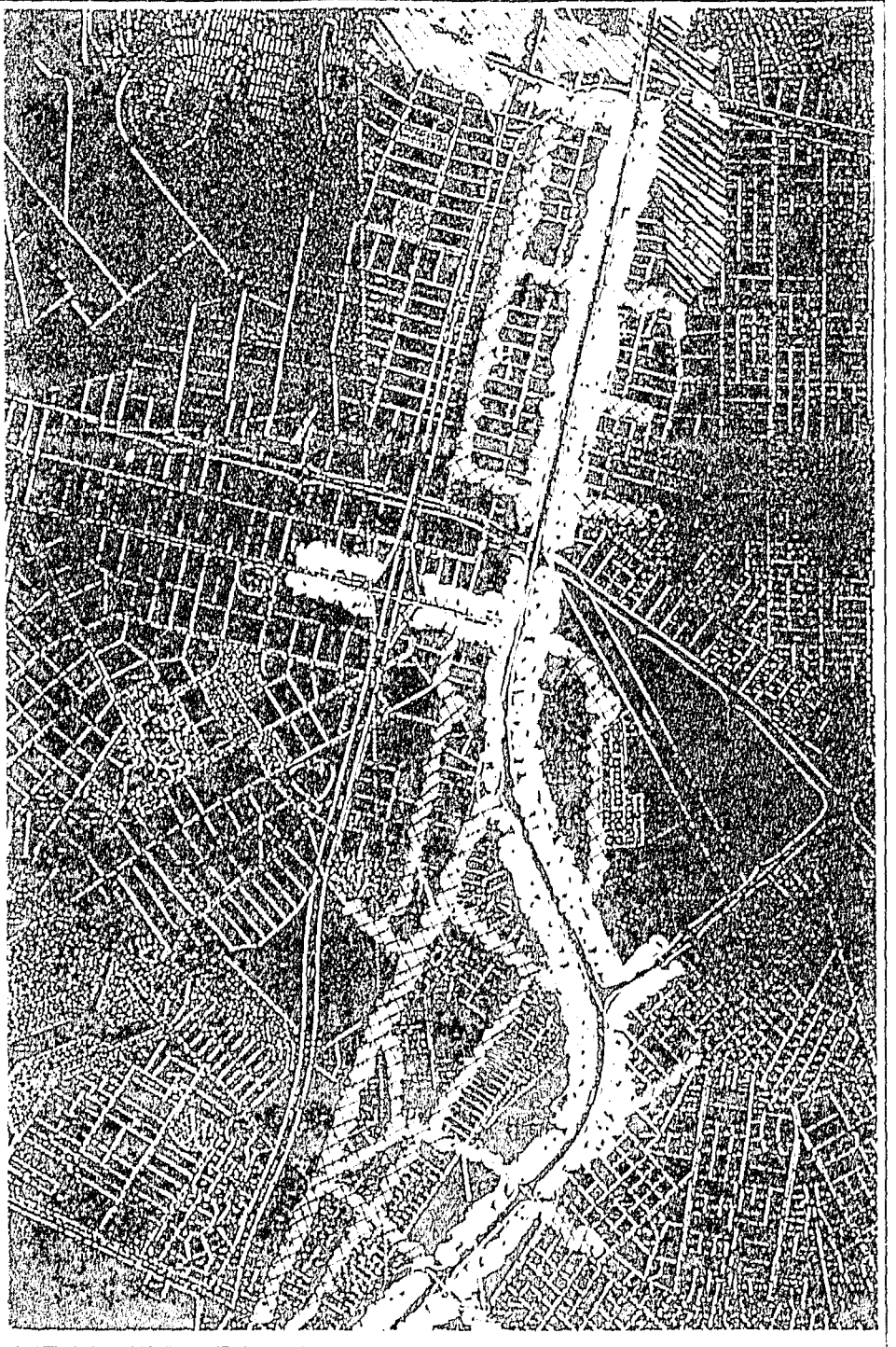
Create double rows of trees where appropriate to provide comfortable pedestrian green corridor.



COLLECTOR ROADS

-Local collectors (e g Richards)

To be lined with large trees to provide shades for both pedestrians and cars.



DEVELOPMENT FRAMEWORK

URBAN GREEN

8.7.3 Implementation

I. Broad policy

MDF (1996) indicates:
" The so called "global nomads" of the business sector are looking for pleasant, safe and sustainable environments from which to conduct their business, and in which to house and educate their families. If these people are to be attracted to Midrand, bringing with them increased value and job-creation potential, then Midrand's Policy needs to change to influence development to create a more equitable, safer, more vibrant, and more sustainable city."

In establishing a broad policy in the context of the exercise therefore, the concept in Crane's explanation of the Dynamic City is emphasized. Here, Crane advocates for the "...principles of capital designing and town building, (in contradistinction to Capital 'budgeting' and town 'planning)... By capital designing, local government is asked to design and build its own facilities in an ordered time-space sequence as a basic control and as some restriction to the Thousand Designers while it creates continuing growth and change. Town building arises from the need for a better method for deciding about the future form." (Crane1960)

At present there is enormous enthusiasm, and high levels of development finance are being attracted to Midrand (MDF 1996). This energy, bringing fast growth and change can be turned advantageous to the population of Midrand if adhered to the above town building principle.

II. Strategy

An efficient policy should include a strategy for the active participation of different sectors of the urban environment: the local council, the community, and the private sector.

Bacon (1974) has related the city to a tree. The city blocks are the leaves, and the movement infrastructure is the trunk and branches system of the

tree. For the tree to exist and last, the trunk and branches system has to be in a sound order while the leaves could come and go. This lends a concept for how and where different sectors will involve.

The local council:
The local council is responsible for the management and integrity of the entire structural system of the city. The council will do so by providing and managing the major infrastructure. This will include the provision and upgrading of roads, public spaces, recreation and other social facilities.

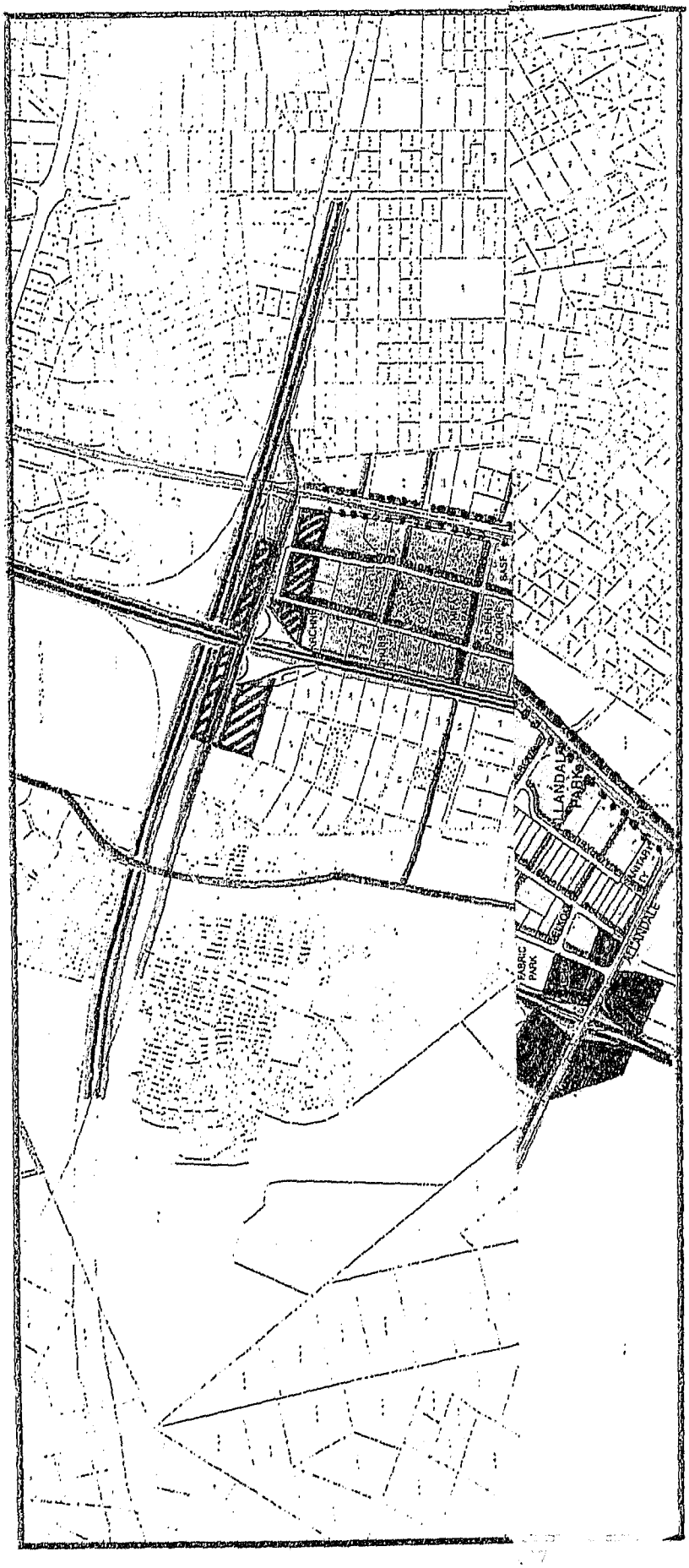
The community:
The community on the other hand is the life of the 'tree'. Thus the community could form a partnership, which could initiate and co-ordinate development in terms of the overall vision. The team will also be responsible for the development of projects and preparing packages that will enable smaller developers to participate in the process. Workshops will also be organised to confirm the involvement of the community at large.

The private sector:
Just like the leaves of the 'tree' do, a good proportion of the urban environment is occupied by the private sector. The private sector will thus play an important role in the continual development of the city. In the process of development therefore, developers and agencies should be brought to the stage where their participation is required.

III. Schedule

The acceptance of a vision will determine the schedule. Once a common vision has been confirmed, it will provide a basis for willingness to participate, and for the availability of funding from internal and external sources.

This set in place, it will then be possible to proceed with the formulation of an agreeable set of guidelines and ordinances for the development. The communities' involvement and support should be confirmed with a comprehensive public participation process at this stage.



KEY:

- LIGHT RAIL ROUTES
- BUS ROUTES
- NODAL ACTIVITES
- POSSIBLE FUTURE NODE DEVELOPMENT
- PROPOSED AND EXISTING MAJOR ROADS
- PROPOSED AND EXISTING COLLECTOR ROADS
- MIXED ACTIVITY BLOCKS
- AIRPORT

DEVELOPMENT FRAMEWORK

PUTTING IT TOGETHER

9.0 SUMMARY AND CONCLUSIONS

It probably all started with that famous question: the question, posed by one of the great theorists of the century, that inspired the subject of this dissertation; the question, (as referred to in chapter 1) "...Whether man shall devote himself to the development of his own deepest humanity, or whether he shall surrender himself to the now almost automatic forces he himself has set in motion and yield place to dehumanized alter ego." (Mumford1961)

One's deepest conscious would know that, given the present trends, it would be an impossible task for one to give an objective answer to such a question. But at the same time it would be tempting to investigate the influences and the effect of the above thinking on an important practice like Urban Design.

It has been understood that this was not one of the most convenient subjects to explore in the capacity of such an exercise. It was however, also believed that with the risk of being unable to achieve and deliver the best results; it was thought useful to begin to investigate the relationship of human technological developments and the urban environment in the discourse of urban design.

It was with this intention that the dissertation started. It aimed at exploring different ways of reconciling new technological pressures in the city. Two extreme views have thus been looked at. On the one hand the view that the urban environment shall be dictated by technology, and new discoveries will determine its future has been looked at. And on the other hand a more traditionalistic view has been shown, which poses an argument that man is in control of his destiny and the future is what man makes it.

The discussion intended to maintain unbiased approach to any of these philosophical understandings. Instead it attempted to let the results of investigation indicate an appropriate position. In doing so the relevant topics that lead to a general understanding of what the urban environment should be like and how urban design should interfere has been looked at.

The subjects covered the urban environment, technology, change, and urban design as both a practice and process.

From the discussions it has resulted that, balance in adopting technological changes, and preserving traditional city building is what has to be favored. As Crane (1968) suggested the environment that favors a combination of 'unusual and conventional' is believed to make an important contribution to human communities. Therefore the discussion concluded by emphasizing the need to create a balance in the environment by embracing the technologically transforming society, while at the same time preserving some of the traditional values that contribute to the ideal human urban environment making.

The case study, in part two has explored the relevance and usefulness of this understanding. It has attempted to reflect and utilize the philosophy and principles contained in the first part in providing an urban design framework for Midrand Strip.

Due to a number of constraints, the exercise might not have included every analysis, alternatives, and possibilities. It is however hoped that the study considered most of the relevant and possible issues to the satisfaction of the scope of this exercise.

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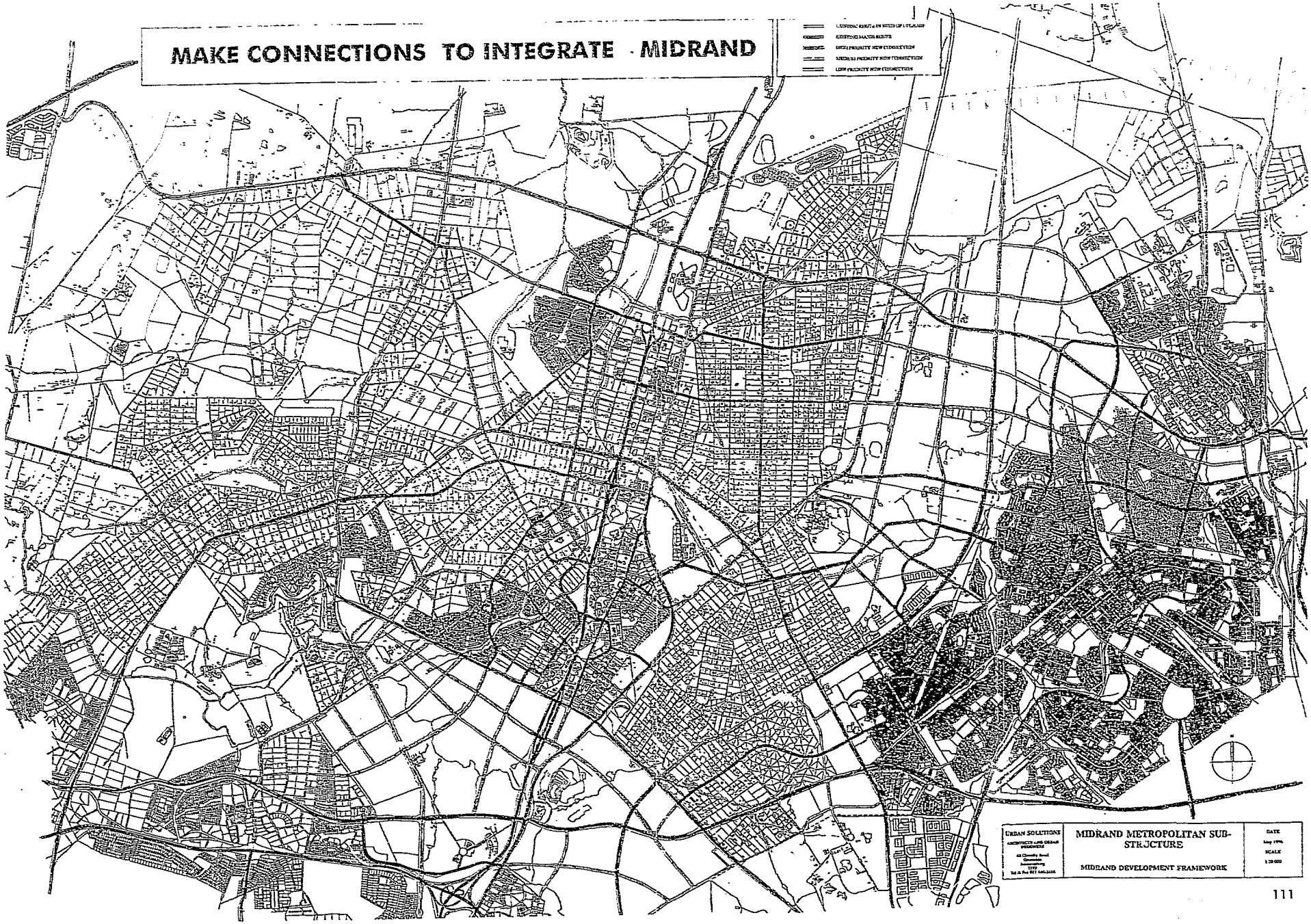
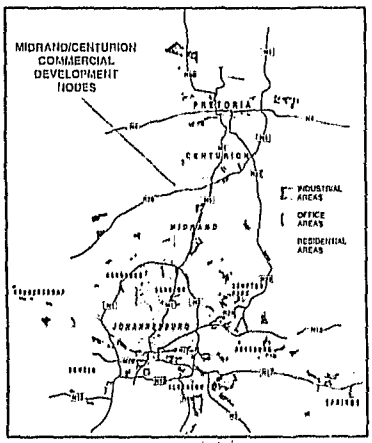
11.0 APPENDIX


MAKE CONNECTIONS TO INTEGRATE · MIDRAND
MIDRAND METROPOLITAN SUB-STRUCTURE
MIDRAND DEVELOPMENT FRAMEWORK

MIDRAND / CENTURION COMMERCIAL DEVELOPMENT NODES



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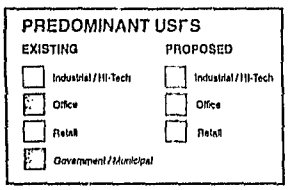



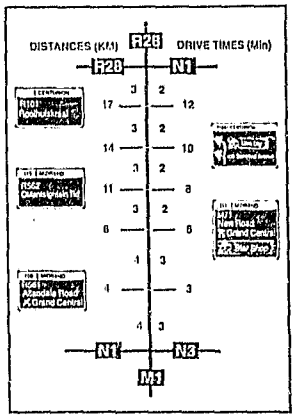

BUILDING NAME	MAP REF
Development Bank of S A	7
Eastside Corp. Close	152
Elite Park	126
Engen Service Station	62
Envirowaste Constructn	169
Essential Sterolin Prod	45
Fabric Library	97
Fedlife Park	89
Firmenich	40
Focon Civil	166
Foster Wheeler Babcock	92
Foxhound Studios	144
Furniture Gallery	174
Gallagher Bus Park	137
Gallagher Corner	142
Gallagher Estate	141
Gallagher Micro Park	138
Gallagher Place North	150
Gallagher Place South	151
GAREC	109
Gateway Industrial Park	1
Gemstones	163
Gerber Goldschmidt	80
Glaxo	94
Goldstein Building	77
Grand Central Motors	55
Halfway Gardnes O P	90
Halfway Hse Method. Ctr	146
Hartland Office Park	98
Haynes Films	171
Highway Business Park	2
Hoechst Schering	76
Homa Gallery	172
Horton Products	14
Hyundai (Midrand)	50
Internall Bus. Gateway	86
Intersat House	156
Inventaprom	147
Janssen Pharmaceutical	50
Johnson & Johnson	53
Johnson & Johnson	79
Krohne Instrumenta	13
Landrover SA	59
Lanzarac	92
Leochem	102
Lindsay Saker	71
Logos - Agvet	33
Log-Tek	34
Madaus Pharmaceuticals	86
Maxiprest Tyres	67
McCormick Glentham	65
Medical Distributors	40
Midas	85
Midlins Business Park	157
Midrand Electricity Dept	17
Midrand Motor City	73
Midrand Municipality	22
Midrand Nissan	110
Midrand Sheriffs Office	125
Midway Comml Centre	111
Midway Park	140
Mila Park	24
Mini Units	112
Mini Units U/C	118
Minis	124
Mitek	39
Mizuno	170
Mondi Recycling	122
Monument Business Park	93
Mount Royal	132
MSD	70
Multi-users	154
Mustek Electronics	26
Nashua	99
NCP Research and Dev.	23
New Development	47
Northview	127
Online Office Supplies	165
Oracle	88
Oxum	48
Parkor Park	123
Philo Pieterse Prodns	37
Plush Products	64
Portland Park	81
Probuild Com Park	120
Progress Park	166
Proposed Mall of Africa	8
Proposed MoAfrika	9
Q-Data	36
Republic Power & Com	173
Routech Systems	129
Rhone Poulenc	51
Richards Drive U/C	145
Richards Park	117
Ridgeview Nursery	134
Robert Bosch	35
Royal Palm Bus. Estate	177
S A Mint	3
Samrand (Phase 1)	6
SANDF	135
Sanitary City	175
SBV Services	131
Schering	75
Shadeways	159
Siemens	89
Sillitek	43
Spur	114
Stanford Park	31
Stevens & Co. Wholesale	42
Strike Technologies	166
Sun Couriers	5
Supa Quick Auto Centre	155
Tecmed	44
Teljoy	32
Telkom	104
Tilbury Business Park	15
Transpoly	18
Triway Park	69
Truvolo	11
UIF (Midrand Municipal)	20
Union Swiss	60
Union Transport	30
Upholstrey and General	105
Value Fairo	139
Volkswagen Coml Centre	12
Waterfall Park	96
Vacant Premises	41
Vacant Premises	46
Vacant Premises	72

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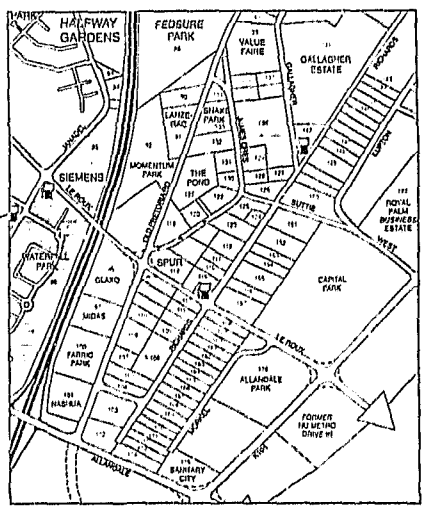

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The two diagrams below illustrate ;

a) the Structure Plan of 1992 for the Midrand MSS, and;

b) a diagram of existing land uses in May 1996 in Midrand MSS.

FIGURE 4.0 MIDRAND STRUCTURE PLAN 1992

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Name of thesis The Technopolis Exploring The Urban Environment And Technological Change In The Discourse Of Urban Design Adous Z A 1999

PUBLISHER:
University of the Witwatersrand, Johannesburg
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