A THEORY ON INTEGRATION

An Investigation into the nature of integration along the R102 - Within Umgeni Road and Clairwood

PREPARED BY:

LISE C. LILLEBY

Submitted in partial fulfilment for the requirements
of the Degree Masters in Town and Regional Planning,
Department of Town and Regional Planning, University of Natal, Durban

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1. ANALYSIS OF CONTENT

1.1 TOPIC AREA SELECTION (RELEVANCE) AND QUALIFICATION

An interesting and extremely relevant choice of topic. The theory developed by the author has enormous potential for utilisation in the restructuring of our cities.

1.2 & 1.3 RESEARCH AIMS AND OBJECTIVES AND FORMULATION OF RESEARCH QUESTIONS

The research aims and objectives are clearly set out. The author's section on constraints and assumptions assists in defining the scope of the study and contributes to the uncomplicated manner in which this dissertation is presented.

1.4 ADEQUACY AND COHERENCE OF CONCEPTUAL FRAMEWORK

The conceptual framework is succinctly written and logically structured.

1.5 APPROPRIATE SELECTION OF LITERATURE

An extensive and totally appropriate selection of literature.

1.6 APPROPRIATE RESEARCH METHODOLOGY

The author has put an enormous amount of effort and thought into the research for this dissertation.

1.7 PRESENTATION OF CASE-STUDY AND FINDINGS

Excellent. Both the written work and the visuals are excellent.

1.8 PRESENTATION OF CONCLUSIONS AND FORMULATION OF RECOMMENDATIONS

By illustrating the implications of each major element of the theory of integration first, the author provides an excellent context for the sub-sections on recommendations.

1.9 LITERARY STYLE AND PRESENTATION

The author's literary style and presentation is outstanding.

2. GENERAL ASSESSMENT

2.1 ADDRESSING RESEARCH QUESTIONS

All the research questions were well addressed.

2.2 CRITICAL ANALYSIS OF MATERIAL

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2.3 COHERENCE AND SYNTHESIS OF INFORMATION

Outstanding.

2.4 COMPREHENSION OF MAIN ISSUES

Excellent.

2.5 STRUCTURE AND ORGANISATION OF MATERIAL

Well structured and logically organised.

2.6 DEVELOPMENT OF ARGUMENT

Excellent.

3. FURTHER COMMENTS

The author showed originality and maturity in her choice of topic. An excellent piece of work and an advance on the theoretical debates surrounding the restructuring of cities.

This is an exceptionally good piece of work. The topic is highly relevant particularly in applying well established general theories specifically to Durban and testing these in two empirically based case studies. The research aims and questions are clearly stated; these form an important part of the structure that runs right through the dissertation. The conceptual framework is built up in chapters 3 and 4. She exhibits a deft touch, drawing on conclusions of relevant literature on South African cities, new policy directions, compact city and activity corridors as a basis for developing a compact, integrated approach. Her conceptual framework incorporates three aspects of integration (spatial, functional and social) each which is broken down into a number of sub-dimensions. This is a particularly useful framework and is used rigorously in the analysis and synthesis of case studies as well as in the conclusions.

The selection of literature is appropriate and the bibliography comprehensive. The research methodology is sound and suitably defined for this level of research. Presentation of case study material is excellent, not only in terms of text and tabulations but also in terms of graphics, diagrams, maps and photographs. The dissertation is written in a clear, direct style and overall the report is of a professional standard.

The conclusions and recommendations have been developed systematically using the conceptual framework and case studies findings. This section of the report, in particular, reveals considerable insight into the issues of integration as applied to the dynamics of the case study areas.

Overall the dissertation represents a substantial amount of work that has been carefully thought out and executed. The product reveals a good deal of creativity, both in the development of a theory of integration and its application in the case studies. As such it breaks new ground and adds value to the current debate in Durban. This certainly goes beyond what is normally expected of MTRP dissertations and therefore deserves a high mark.

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Thanks to the "Powers That Be" for getting me through this and to my Dad for making it possible. If it was not for Marian Ryan I would have given up in despair ages ago. Thanks also to the tremendous efforts of my Mother and Sal.

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CHAPTER 1 INTRODUCTION

1.1 Context / Background

South African city form is characterised by fragmentation, separation and low-density urban sprawl. This is largely a result of Apartheid ideology, anti-urbanisation policies and inappropriate planning. With an increased awareness of the inefficiencies and inequalities of city form, emphasis has been placed on restructuring South African cities. Reorientation, reintegration and the redressing of historical inequities form some of the goals of the restructuring process.

One of the main approaches is that of the "compact-integrated" approach which emerged from the University of Cape Town with David Dewar (Urban Problems Research Unit) analysing the structure of the Apartheid city and attempting to understand the elements of urbanism and what makes a positive urban environment[1].

The philosophical position of this approach involves a planning consciousness based on humanist and conservationist concerns. The starting point lies in understanding people's motivation for living in cities; Dewar writes:

> *"People do not come to the cities to find housing. They come in order to experience the economic, social, cultural and recreational opportunities and facilities which can be generated through the physical agglomeration of large numbers of people" and "the ability of an urban system to generate these opportunities is profoundly influenced by the way in which an area is structured and made" (1991)*

Neo-traditional development focuses on conditions of urbanity. A desirable aim for city form is to promote growth and equity by providing a multiplicity of opportunities to

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[1] The studies culminated in the publication of South African Cities: A Manifesto for Change (Dewar & Uytenbogaardt, 1991). This is considered the definitive work of the compact-integrated approach.

urban dwellers, as well as to promote high levels of access to these various opportunities. Urban environments should be dense and complex with mixed uses and different activities acting to reinforce each other in positive, convenient and dynamic ways. These issues give rise to the central theme of this dissertation: that of integration. Spatial, physical, social and functional integration are integral parts of desirable urban environments. Integration should be a major consideration in the reconstruction process of South African cities. Used effectively, integration is a tool which can promote the qualities of urbanity which our cities lack and provide opportunities for all urban dwellers.

Generally, the need to generate more efficient, inwardly-focused and intensive development in urban areas - through compaction and consolidation as spatial restructuring policies - has been identified by urban planners in recent years. Briggs (1994a) identifies a 'growing consensus' and support for compaction policies amongst various organisations, academics and professionals. Compaction promotes and creates conditions favourable for integration. Integration is a concept or principle which could work against dislocation to generate sustainable levels of interaction, economic activity and conditions of urbanity.

Within this move for restructuring the South African city much attention has been paid to the Compact City Approach and the concept of "Activity Corridors" (rooted in the Compact-Integrated Approach). From this, the Activity Corridors concept emerges as one of the significant structural relationships to be pursued and has as its goal:

> *"(to) Promote continuity of urban fabric and the full utilisation of the potential of connector routes" (Dewar & Uytenbogaardt, 1991).*

The author of this study sees "continuity of urban fabric" as a direct reference to the levels of integration required between all elements of the 'urban fabric'. The Activity Corridor Concept utilises the concept of integration as a basic motivation and underlying dynamic of connector routes. It is the intention of this dissertation to unpack the concept of integration with respect to Activity Corridors and integration as a principle and to draw on these theories in order to develop a theory on integration which can be applied to urban areas. This will then be applied to two case study areas to identify what levels of integration exist in reality.

Dewar and Uytenbogaardt (1991) describe the base of the compact-integrated approach as being firmly rooted in the **needs** of urban dwellers. Needs give rise to implications of form (and hence to programme) which include elements of: balance; freedom; equity; intensity, diversity / complexity; integration; and community. Integration is an important element in the generation of well-performing urban environments; it promotes equity, efficiency and variety as well as the generation of opportunities through increased interactions.

1.2 Relevance of Topic

As mentioned above, the South African city is inefficient, inequitable and spatially dislocated. Given the need for appropriate restructuring policies, the 'compact-integrated' approach and the concept of Activity Corridors have much to contribute to urbanisation policy. Planners, however, must be aware of the contextual environment and the local forces and processes at play in order to develop an appropriate set of policies for urban form. It is for this reason that integration would appear to be such an appropriate principle for urban reconstruction.

The Activity Corridor Theory derives from precedents set in Cape Town. Various studies have focused on refining the concepts and understanding the criteria and implications of Activity Corridors (Chittendon and Associates, 1990; Green, 1989 & 1990; Naude, 1990, amongst others) but few have studied the potential of corridors and the character of 'corridors' in different contexts. Durban is contextually quite different to Cape Town and its idiosyncrasies - and the implications thereof - must be recognised. Planning needs to be relevant and has to be taken seriously. The only way this will occur is if it remains firmly rooted in reality. To quote Foweraker (1981:121) "In practice, theory is different". Given the small amount of attention that has been paid to the realities of the theory, the need for further study into the applicability of the concepts is important. The concept of integration has been discussed to an extent but the details have not been unpacked by Activity Corridor proponents. This study hopes to partially fill that gap as well as point out important areas for further research.

The express purpose of the case studies was to gain an insight into existing relationships and dynamics underlying integration. The general theory developed will hopefully provide a base for debate, and further study, as well as an indication of its importance as an element of the restructuring and reorientation of urban environments in South Africa.

1.3 Definition of Terms / Glossary

Accessibility

Is the ability to reach a wide range of activities, persons, resources, opportunities and information with the least effort and cost. That is, it is the proximity and ease of physical entry to places of work, recreation, education, etceteras (Western Cape Economic Development Forum, 1995).

Activity Corridor

Is a metropolitan-scale linear band/zone of high-density urban mixed-use development concentrated along a public transportation route, or activity spine, where high concentrations of different land uses (commercial, business, social, cultural and residential), transport and densities occur. See Figure 1 below. The width of the corridor is defined by the local zone of influence of the activities centred on the spine. This is represented by walking distance, that is, 10 - 15 minutes on either side. This translates to 800m - 1km on either side and yields an approximate total width of 2km (centred on the spine). Corridors accommodate major transport routes which channel different modes of transportation for example commuter vehicular traffic, bus, taxi, pedestrian, etceteras.

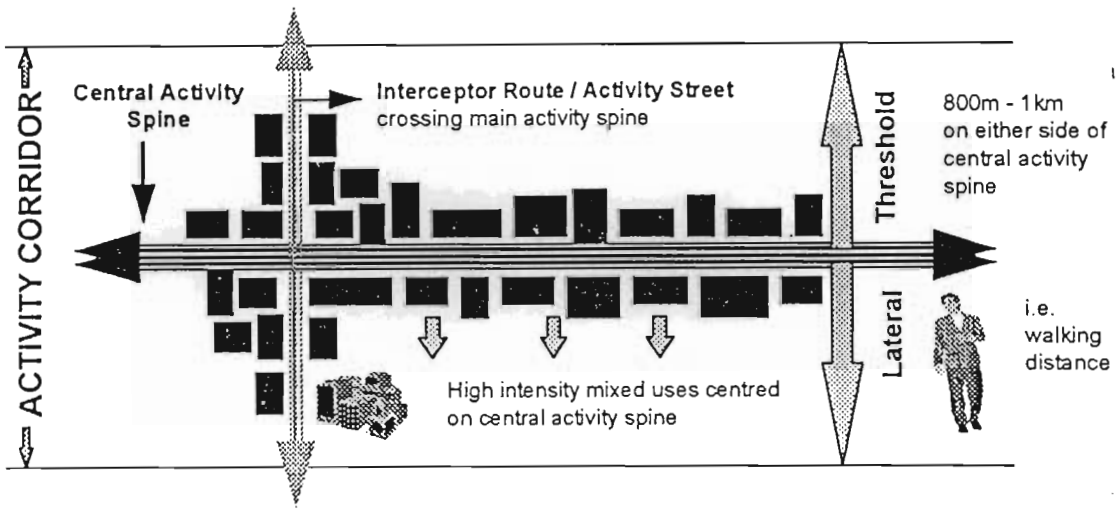
Activity Spine

Is the central road within an Activity Corridor along which the (road-based) public transport movements are concentrated and which therefore provides the most desirable locations for business, community facilities and high density housing. See Figure 1 below.

Activity Street

Is a mini-Activity Corridor which occurs on a local scale and is similar to the old English 'high street'. These can occur anywhere in the metropolitan region but should also occur at interceptory points along Activity Corridors. An example in Durban is Sparks Road.

Figure 1 Conceptual Illustration of an Activity Corridor/Spine/Street



Activity Systems

Have been used in the document to describe routes which appear, or have been implied, to be potential Activity Corridors but which have not been adequately tested to be able to 'safely' refer to them as Activity Corridors without being misleading.

Activity Zone

Is the area of high intensity activity and is the same as the Activity Corridor.

Compaction

Is a term used to refer to the overall process of directing city growth inwards and of discouraging outward sprawl. This incorporates the strategies of infill (development of vacant land within built up areas), densification and containment (containing new urban growth on the urban edge).

Densification

Is the intensification of development and increasing population densities within existing built environments. This may occur as a spontaneous process or as policy aimed at increasing densities.

Edges

These are the boundaries between two regions or 'phases' which represent breaks in continuity. They may be semi-permeable or non-permeable. For example, edge of development, walls, shores, etceteras.

Efficiency

Is the ability to perform a designated function effectively, that is, the most economical and viable way of achieving a specific result. An inefficient urban form imposes costs on its users - these are not just financial costs but also social costs in terms of time and lost opportunities. Inefficient cities prevent the optimisation of benefits of different interactions and activities.

Equity

Refers to the fairness in distribution of resources and access to resources, which enables people to take advantage of them taking into account any disadvantages they may experience (Western Cape Economic Development Forum, 1995).

Integration

"Combining into one whole" or "to unify diverse elements" (Collins Dictionary). Integration of urban activities and local areas is seen as being directly proportional to the generative capacity of the urban system as well as to convenience, efficiency and equity. Integration should occur at the macro / metropolitan level and at the micro / local level. In this document it refers to the spatial / physical, social and functional interaction between urban activities and local areas within a city. Activity Corridors are one of the main promoters of urban integration.

Mixed land-use

This refers to the combined use of a building/s, site/s by different land uses. These uses may include retail, commerce / business, institutional, residential, light / service industrial uses, transportation and/or recreation. These mixed uses may occur horizontally (for example shop in front and residence at back),or vertically (for example shop on first floor and residence above).

Movement Channels

Channels along which people move. This includes any mode of transport (from pedestrian to buses) and are therefore pedestrian paths, roads, highways, etceteras. These are 'predominant elements' in the city and in the perceptions of people (Lynch, 1960). People observe the city as they travel through it and it is along these paths that the elements of the environment relate and are arranged.

Multi-functionality

This refers to a building, a block, a certain space or district which has more than one function. This could refer to different uses at the same time or to temporal multi-functionality which is different uses at different times. Multi-functionality has a broader meaning than mixed-use. For example, school grounds can be used for education, recreation, as a place of worship and as a community hall.

Threshold

Is the number of people required to sustain a service or good and is directly related to income and accessibility.

Urban Fabric

Is the 'grain' or spatial pattern of urban development. It takes into account the distribution of land uses and activities, the nature and amount of space between them and the road network servicing and linking them. Big buildings, with large spaces between them and few roads create a coarse urban fabric (Western Cape Economic Development Forum, 1995).

Urban Form

Is the physical 'look' or morphology of an urban area and how the different permanent physical objects (buildings, streets, utilities, etceteras) look and stand in relation to one another, and relates to the height, size and shape of the city. The form of the city is an outcome of values which inform the spatial policies.

Urban Structure

Refers to the 'layout' or the spatial geometry of the urban area, or the pattern of settlement, as created by the connecting elements (for example transport links, parks, squares and open spaces) and how they relate to one another. That is, the spatial

distribution of different land uses and activities, their flows and interactions. (Western Cape Economic Development Forum, 1995 and Seneque Maughan-Brown SWK, 1995).

1.4 Chapter Outline

The dissertation is divided into three main sections. The first provides background to the research. The second section contains the body of the research itself while the third incorporates the synthesis of data, the conclusions and recommendations.

Chapter One has provided a context to the study and has explained its relevance as a theme for research. The glossary has provided definitions for the main planning terms and concepts used within the report.

Chapter Two details the nature of the research question and sub-questions. The constraints and delimitation's of the research are also described. The assumptions of the dissertation have been made explicit to provide a grounding for the research itself. The process of research is detailed in the methodology section.

Chapter Three provides a theoretical background to the study. It explains the main theories from which the research draws. Details of the South African city are given to place the nature of questions in a context. New Policy Directions are introduced and the Compact City and the Compact-Integrated Approaches and the Activity Corridor Theory are discussed.

Section Two begins with the theory of integration as developed by the researcher. The exact meaning and dynamics of integration are sought. The study looks at spatial, functional and social integration: what these are, why they are necessary and how they can be achieved. A theory on integration is thereby developed. This is found in Chapter Four.

Chapter Five introduces the case study areas: Umgeni Road and Clairwood. Their relevance to the topic and applicability is discussed. The existing situation as detailed from the data research is given. A good look is then taken at what dynamics exist in reality and these are analysed using the theory of integration developed in

Chapter Four. Which elements of the research findings further integration and which hamper or prevent integration from occurring?

The findings of the analysis are then detailed in Chapter Six and conclusions drawn as to the relevance for integration. Conclusions regarding what has been learnt about spatial, functional and social integration are set out.

Chapter Seven then draws out what the implications of the findings are for integration as a policy. The dynamics of integration are identified and these are drawn into recommendations for achieving integration as well as for planning practice.

Chapter Eight gives a brief evaluation and draws the report to a close, followed by the bibliography and appendices.

CHAPTER 2 RESEARCH QUESTION

Integration is one of the most important concepts within the Activity Corridor approach. As a structural relationship in Activity Corridors, it can be understood at both the metropolitan scale and the local scale. An important feature of Activity Corridors is their capacity to integrate "adjacent and otherwise discreet residential areas into a unified system" (Chittendon & Associates, 1990:12). Local level integration is seen in terms of the interrelationships of mixed land uses and activities within the Activity Corridor zone. Of particular interest to this dissertation is the nature of integration and the extent to which it exists in reality. The dissertation focuses specifically on integration between the residential land use and the other elements or land uses of the activity system (on a local scale). The factors which underlie spatial / physical, functional and social integration need identification and investigation. These are the dynamics which the research seeks to investigate.

The research question, therefore, is:

To what extent do the predominantly residential areas of the R102 Activity System in Clairwood and Umgeni Road exhibit spatial/ physical, functional and social integration with the other activities and land uses present?

2.1 Research Sub-Questions

For the purpose of this dissertation, the concept of integration is based primarily on the Compact City Approach and the Activity Corridor Theory. Integration is a common denominator in the theories aimed at restructuring South African cities. For this reason the first task of this dissertation is to set up a stand-alone theory on integration. The details of these theories thus need to be investigated in order to establish some clarity on the nature of integration and its role in urban policy. The meaning of integration and the underlying dynamics then need to be identified. Criteria will then be set up and the details of integration extracted from the above-mentioned theories.

Once integration itself is clearly defined, the research process attempts to look at what exists in reality. Two case study areas have been chosen in order to identify what the existing situation is and what this reveals about the nature and extent of integration that exists. The study sets out to identify existing elements of spatial / physical, functional and social integration.

Following this, the factors underlying the research findings need identification. Possible explanations for the findings are explored. These include: development controls, planning ideology, contextual specificities, amongst others.

Finally, the dissertation sets out to investigate the implications of the case study findings for integration as a spatial restructuring policy. This step is necessary as a prelude to conclusions and recommendations which are made with respect to:

- integration within activity systems in general; and
- integration as a theory and policy.

The sub-questions of the research process can therefore be summarised as:

i. What is integration?
ii. What is the existing situation in the case study areas? What levels of integration exist in reality?
iii. What are the underlying factors?
iv. What are the implications of the case studies for integration as a policy?

The first task is to construct a theory of integration. It is necessary to have an understanding of what the elements of integration are and what they mean for urban environments. Before a study on integration can commence it is necessary to identify exactly what is meant by spatial, physical, functional and social integration.

Secondly, it is necessary for the research to analyse the existing situation in the case study areas. From a thorough analysis of activities, land uses and nature of the areas an insight into the extent of integration will emerge. The nature of integration will also be identified.

It is consequently necessary to explore the possible explanations for the findings. The underlying factors will highlight specific dynamics underlying integration or the

lack thereof. This is expected to include: development controls, particularly zoning regulations, layout design and contextual specificities amongst others.

Finally, the implications of the findings for integration as a policy will be explored. Conclusions and recommendations will be identified. Any relevant implications for planning in general will be highlighted.

2.2 Constraints & Delimitation's

Due to the abundance of issues which arise from the task of restructuring the South African city, the concept of integration as espoused in the Activity Corridor Theory has been chosen in order to scale the investigation down to a manageable size and topic. Urban environments are inequitable and inefficient and there is a high number of urban dwellers without access to an adequate level of activities and facilities. The integrative function of Activity Corridors, therefore, has been considered to be a particularly pertinent issue in the context of the fragmented organisation of the South African city. An essential element of Activity Corridors is the fact that the corridor and the residential areas are mutually interactive - each influencing the other. It is therefore necessary to investigate how the Activity Corridor relates, whether or not it integrates and serves the residential areas within.

The study concentrates on integration with respect to Activity Corridors. Integration is also a goal of urban design in a broader sense. The detailed design elements of integration were not included except where concerned with Activity Corridors. Activity Corridors are the main tools for achieving integration of urban environments and, for this reason, are the focus of this dissertation.

Integration can cover a wide range of elements. Integration between different land uses and activities is complex and varied. For the purposes of manageability the dissertation looks at how the residential land uses are integrated with the other land uses, activities and opportunities within the corridor. The inter-relationships between the other land uses will not be investigated. For example, integration between facilities, commercial activities and transportation are ignored for the purposes of this study.

Because of the scale of the research only the local aspects of integration will be studied and not metropolitan scale integration although this will have some influence within the local scale. Metropolitan linkages do have some relevance to integration on a local scale and where this is the case it is discussed. The overall perspective, however, is local. The study concentrates on two segments of the activity system which has been identified, as it would be impossible within the scope of this study to analyse the system in its entirety. Different generic areas can be described along the Durban Activity System of which the case studies chosen appear to exhibit the best possible range of Activity Corridor characteristics.

Although integration could possibly be analysed in a number of different ways, the study concentrates on spatial / physical, functional and social interaction. These are considered to be sufficiently broad groupings without sacrificing a certain level of detail.

The dissertation, therefore, concentrates on two specific case study areas within an activity system; and the spatial, functional and social integration of the residential land use component together with the other land uses and activities present within that system.

2.3 Assumptions

1. It is assumed that the promotion of growth and equity through the provision of a multiplicity of opportunities to urban dwellers, and the promotion of high levels of access to these various opportunities, are major goals of city form.

2. It is assumed that for urban environments to be positive they should be dense and complex. They should have mixed uses and different activities acting to reinforce each other in positive, convenient and dynamic ways.

3. Urban performance is a function of the degree to which urban activities and local areas within the city are integrated.

4. Integration is identifiable and can be analysed.

5. Spatial, physical, social and functional integration are integral parts of desirable and positive urban environments.

6. Integration between the residential land use component with the other land uses of the Activity Corridor should exist as being one of the main functional goals of Activity Corridors.

7. The R102 in Durban represents an Activity Corridor in its early stages of development.

8. It is assumed that lessons learnt with respect to the case studies will be applicable to urban areas in general. The study is expected to contribute to a general understanding of integration within Activity Corridors as well as integration as a policy in itself.

2.4 Methodology

The research process has intended to develop an understanding of the concept of integration using both theoretical research and case studies.

The first step involved the identification of relevant theories and existing literature to form the conceptual framework. The conceptual framework then provided a base from which to start unpacking the concept of integration. The Activity Corridors Theory provided a backbone of theory and a stepping stone for the development of a theory of integration. In order to assess the case studies it was necessary to put together a theory on integration.

Integration had to be defined and unwrapped before any detailed analysis of the case studies could be done. The theory of integration had to explain what integration involves and what the perceived dynamics were. Three perspectives were used for the analysis of integration: spatial, functional and social. A new theory on integration was then developed in order to guide the case study analysis.

Once integration had been explored on a theoretical basis, it was necessary to look at what exists in reality. Two case study areas were identified: both corridor sections along Umgeni Road and Clairwood. Refer to the interleaved Locality Plan No. 1. Both these two areas are a part of the 'R102 Activity Corridor' and it was expected that they would provide practical examples of integration. The R102 system has been labelled an Activity Corridor-in-the-making and was therefore expected to exhibit some "Corridor" characteristics (Seneque Maughan-Brown SWK, 1995). The purpose of using case studies was to identify what levels of integration existed in reality. This necessitated a three-phase process:

1. What is the existing situation?
2. What are the underlying factors?
3. What does this mean for integration?

The first step involved data research, a land use analysis, transportation analysis, visual analysis and a thorough qualitative investigation into the dynamics of the case study areas. Had it been possible within the scope of the study, a survey of residents

in the areas would have provided valuable information. This was, however, not possible.

The land use analysis aimed to identify what land uses were present. The data was collected during a number of field trips into the study areas. Land uses were differentiated according to expected influence on the residential areas. Appendix 1 gives more detail about the categories used. Commercial, retail (including shopping centres), service activities and market or informal trading were identified as land uses most likely to generate interaction with local residents on a fairly frequent basis. They formed a category of land uses referred to as "Commerce-based activities".

General Offices, wholesale / distribution, warehousing and light industrial manufacturing were considered less important in terms of interaction-generating ability and they formed two categories: "Office" and "Light Industrial". The possibility of employment-based interaction was not excluded. It would have been beneficial to find out exactly where residents worked but the exercise was beyond the scope of this study.

Mixed uses were considered significant as interaction is generated with the residential uses. Mixed uses are also significant because they exhibit a form of land use which generates diversity and the qualities necessary for - and part of -integration.

Residential land uses were differentiated according to building type. Single dwelling units formed a category on their own: Low Density Residential. Attached housing and 2 - 3 storey flats were included in the second category: Medium Density Residential. The third category, High Density Residential, included flats of 4 storeys and greater as well as hostels and hotels. Informal settlements were also identified in the fourth category.

Facilities identified include: educational facilities, institutional or medical, religious, cultural/entertainment, post offices, police stations, cemeteries and open space.

Transport-Related Land Uses formed another land use category which included petrol filling stations, bus ranks, taxi ranks and provisions for parking. Other land uses identified but not considered important include: Infrastructure (sites used for

water reservoirs, electrical sub-stations, etceteras), Heavy/Extractive Industry, Vacant and Government/Municipal (government offices, military sites, depots, etceteras).

A transportation analysis included the collection of data with regard to the number of vehicles, by different modes, entering and leaving the study area by different routes. This was expected to give an indication of the relative importance of different routes within the study areas: with respect to each other and with respect to the corridor. Traffic flows, it was hoped, would aid in identifying major movement channels.

A visual analysis was necessary to identify a number of issues:

- Who uses the areas?
- What are the people doing in the areas?
- What activities are occurring, and what nodes of activity exist?
- What are the orientation and intensities of uses in the study areas?
- What movement channels are utilised and which are not?

That is, to gain insight into the workings of the areas

Data evaluation included a demographic analysis. Information regarding the total population (1995) and breakdowns according to age, sex and race were obtained as well as household income categories. The information was available at suburb level and so had to be applied to the study areas. The percentages were used based on the assumption that the distribution of categories is uniform throughout the study area. This data, therefore, cannot be considered to be one hundred percent accurate but it gives sufficient detail to be able to construct a valid profile of the areas.

Qualitative analysis included discussion with a number of planners currently involved with both the study areas and the R102 itself. Mr Ian McIntosh and Mr Brett Besthwetherick, both of the Development Control Department at the Physical Environment Service Unit, City of Durban, were contacted in connection with Clairwood and Umgeni Road respectively and the dynamics in the areas. Mr Elroy Africa, Ms Karen Peterson and Mr Carlos Buldogh were consulted on an ongoing basis. They are currently involved in a study for the City of Durban which calls for a thorough analysis of the Durban Activity Corridor / R102 system. These people provided data and qualitative information with regards to the corridor itself.

Analysis of the data had to go hand-in-hand with an investigation into possible factors underlying the dynamics identified. Different factors may have influenced (positively or negatively) the areas' ability to act as integrators. These were anticipated to include zoning regulations and planning ideology, for example.

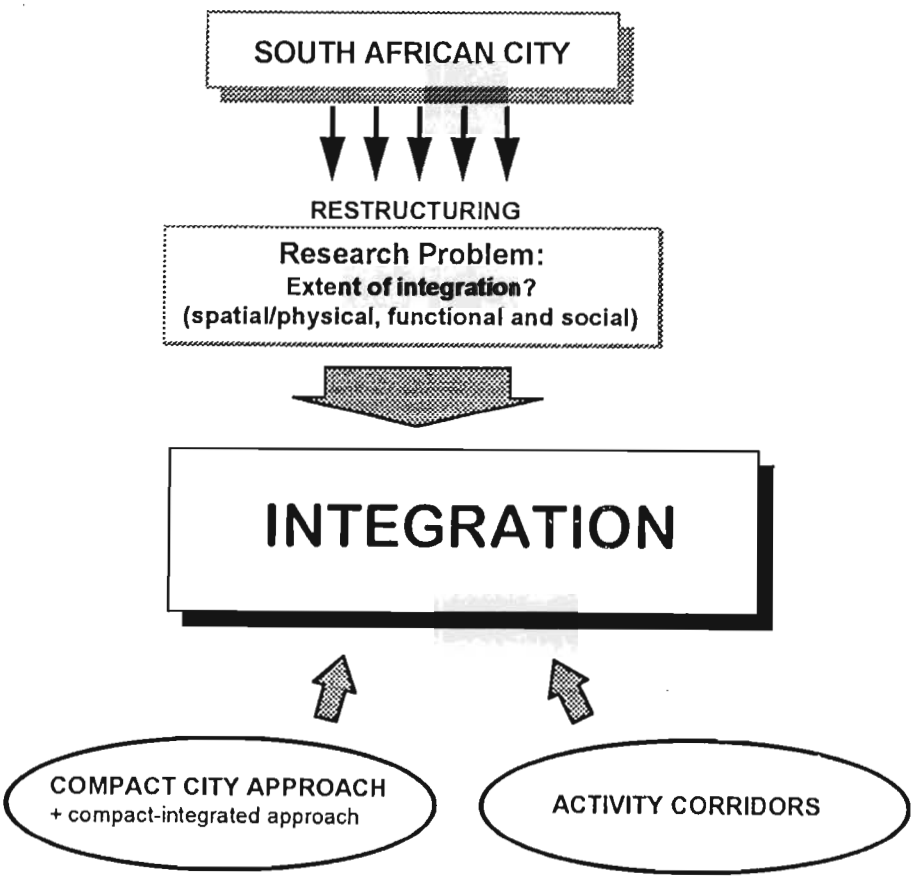
CHAPTER 3 CONCEPTUAL FRAMEWORK

3.1 Introduction

The conceptual framework is structured (see Figure 2 below) to develop an understanding of the theories, concepts and precedents which inform the study. The need for this type of investigation, as mentioned above, arises out of the structure of the South African city and the need for appropriate restructuring policies. The conceptual framework therefore outlines the South African city and the consequences thereof. Thereafter new policy directions are described.

Integration is a structural policy which is an important element in both the Compact City and Activity Corridor Theories. The conceptual framework, therefore, defines this study's definition or understanding of integration and the motivation underlying its perceived importance as a planning policy.

Figure 2 Structure of Conceptual Framework



3.2 The South African City

The structure of a city is significant as it directly influences its ability to generate opportunities. Cities have always been major generators of opportunities. These opportunities emerge from the complexity, diversity and choices inherent in urban systems. While these (in the words of a GAPS Study, 1993:5) are:

> *"not simply spatial ... it is imperative that the spatial context of the urban system be understood as a primary enabler of complexity. It is possible to stunt networks of complexity by defining inappropriate spatial models and thus limit the extent to which the urban system is able to spawn opportunity".*

This disintegration of urban networks and the non-integration of the urban fabric negatively affects the quality of life of urban dwellers, particularly for the poor. As mentioned earlier, the structure of the typical South African city is characterised by fragmentation, separation and low-density sprawl. This spatial organisation gives rise to a city form which is inefficient, inequitable and non-functional, particularly for the lower income groups. These patterns of urban planning and city form in South Africa have had severe and far reaching consequences. Apartheid ideology, anti-urbanisation policies (and deconcentration policies), imported planning principles and planning controls are some of the prime causes underlying this spatial form.

Apartheid had as its goal the separation of race groups, and hence resulted in fragmentation of cities according to race and income. The spatial separation of race groups was achieved by separating the residential areas by buffer zones, open spaces and major transportation axes while employment areas were 'shared'. The poor (generally black) were located on the periphery, away from the opportunities found within the city and the white, higher income areas located closer to the urban centre. The majority of the black urban population was therefore located "in remote residential areas with few economic opportunities and a low level of social facilities" (Hindson Mabin & Watson, 1993:10). There is a very uneven spatial distribution of public goods as well a high degree of variance in local environmental quality (Smit & Todes, 1987).

Anti-urbanisation policies and imported design, planning standards and prototypes had a range of influences on the spatial structure. The non-integration of activities and land uses is a direct result of planning theory. Planning in South Africa was

based on the concepts of separation and of cellular development. Most significant was the desire to separate land uses and urban elements in general. This was effected primarily by zoning land use controls and led to separate journeys being incurred for just about every activity in urban life. Deconcentration and decentralisation policies have led to the isolation of settlements on the urban edge while they are still functionally linked to the main urban centre (Hindson, Mabin & Watson, 1993). Separation perpetuated every aspect of urban life: separation of land uses (work / home), of social amenities and of urban elements in general and of race and income.

Large amounts of movement were generated by the separation of land uses and activities. This imposed high costs on urban dwellers in terms of time and money. The long travel times impacted mostly on the lower-income groups and it imposed huge costs. These costs include material, social and individual costs as they affect incomes, family and social life, parental supervision, productivity, etceteras. In a 1985 study by Naude and Oosthuizen (cited in Smit & Todes, 1987) it was estimated that 20% of all African commuters in South Africa spend between 3, 5 and 7 hours a day travelling obviously long distances. Poverty, unemployment and inequality were aggravated. Long distances were generally created between many urban opportunities and facilities. This led to a coarse urban fabric which lacks integration. The South African city has not been scaled to the human being / pedestrian.

Since the 1920's, planning has been influenced by the British 'Garden City' and the American "Neighbourhood Unit" model of urban development (Hindson, Mabin & Watson, 1993:16). These models promoted suburban development. This suburban sprawl took the form of low-density outward spread and created space-extensive and inefficient environments. Low building densities and the domination of single-house developments have reinforced sprawl. Nairn (cited in Hall, 1988:298) criticises the suburban landscapes for the fact that "each building is treated in isolation, nothing binds it to the next one". He argues that "togetherness in the landscape or townscape ... is essential" (ibid). Environmental degradation was also a consequence of the sprawl and land use inefficiency.

Low density sprawl also built on the neighbourhood unit as its organisational concept. Planners concentrated on cellular development which was non-continuous, inwardly-

oriented and created mono-functional pockets of development. All facilities were placed at the centre. The Classical Neighbourhood Unit, as developed by Perry in 1926, defined the optimal size of a neighbourhood to be of 5,000 people. This was considered an adequate size to cater for people's day-to-day needs while being small enough to develop a sense of community. Perry did not mean for the neighbourhood itself to be an impermeable unit, "he envisaged a rich interaction with other neighbourhoods and with the rest the the city." (Broadbent, 1990:126).

The neighbourhood unit had as its threshold a density of 25 units per hectare. The basic cellular system does not provide for households at different stages of life. The threshold was based on the requirements of a primary school and this is not big enough to support the social and commercial services on which suburban life depends (Green, 1990).

The concentration of commercial, business and light industrial activities in the nodes located at the centre of white suburban communities (Smit & Todes, 1987) has proved to be inefficient and has led to increased expenditure by the lower income groups. There was significant income leakage from the black areas into these white locales. Instead of black businesses and black local entrepreneurs benefitting from black custom, white-owned businesses were being supported.

The lower income areas were also denied the spending power of the higher incomes. With only lower-income groups concentrated in a particualr area the thresholds are not sufficient to sustain adequate activities. If there is a mix of income groups then the spending power of the higher income groups increases the thresholds and thereby enables more activities to be supported. Further, extra transport costs were incurred by these marginalised, lower-income groups as they had to travel out of their way for goods and services. This decreased their disposable income which could otherwise be used for health care, etceteras.

Resources (land, energy and finance in particular) were wasted and investment was inefficiently utilised. Inconvenient environments imposed high costs. This wastage of resources from fragmentation highlights the need for integration as an urban strategy.

There were limited opportunities as a result of flows being concentrated on the boundaries - there was no chance to benefit from through traffic. People were denied opportunities which would normally have been generated in diverse integrated environments. The dispersal of residential areas coupled with the separation of income groups and the planned inward orientation of communities placed limits on the potential for small business development. This spatial form leads to low thresholds which retard small business (Smit & Todes, 1987).

Traffic flows on boundaries also led to the separation rather than the integration of residential areas from each other and the rest of the metropolis. Moreover, emphasis on planning roads designed solely for the passage of vehicles has led to urban environments which are scaled to the car rather than to people. With vehicular convenience being a major goal, stopping is restricted as much as possible along most routes. Thresholds are therefore not generated as traffic passes by without contributing to local threshold potentials.

Mono-functional and monotonous areas were also a result of the separation of non-residential land uses from residential land uses. Hindson, Mabin & Watson (1993), amongst others, argue that monofunctional areas lead to the inefficient use of urban infrastructure, with city centres and industrial areas being empty at night, while the residential areas are unused during the day. Monotonous environments are the "antithesis of the spatial form which would promote urbanity particularly the kind of urbanity which we think is important in South Africa" (Smit & Todes, 1987:14). The key to urbanity is contact, diversity, freedom and choice (ibid) and these are limited and constrained in the present spatial structure of South African cities.

In the mid-80s the inevitability of urbanisation was recognised in South Africa but the spatial patterns continued to exacerbate the inequalities and spatial disjunctures. South African city form, therefore, is inefficient and costly. Not only are land and resources used on an extensive and therefore wasteful basis but high expenses were placed on urban dwellers. In the words of Smit & Todes (1987:13) "attenuated and segregated urbanism imposes appalling costs on the poor".

"Urbanisation has largely occurred on the resource-poor periphery and has led to growing disjunctures between home and work" (Todes, 1994:523) and so the task of

creating more equitable and efficient cities and urban areas will call for "restructuring at both the scale of the whole city and at the scale of its different parts" (Hindson Mabin & Watson, 1993:8).

3.3 New Policy Directions

It is from this background that the need for restructuring the South African city has emerged. Restructuring policies aim to create positive urban areas which generate economic, social and commercial opportunities and facilities. These opportunities must be accessible to the greatest number of people. Urban environments need to be efficient, integrated, equitable and sustainable (Urbanisation Task Group,1994). There are certain principles which are needed to guide restructuring policies and urban growth management. Activity corridors are advocated to promote all these principles which include:

- the reorientation of urban growth away from the periphery to an inward focus; and in so doing there should be an emphasis on encouraging urban systems to develop their own logic, that is, directing urban growth;
- higher density development in new areas and where space or land is ineffectively used, that is, compaction and densification; this will maximise the generative capacity of urban systems while increasing accessibility and convenience; as well as the promotion of 'continuity of urban fabric';
- reintegration of the fragmented parts of the city (specifically in the areas of mixed land uses and public transportation, that is, a more integrated city form and more complex levels of order; spontaneity and freedom of response should apply, to allow for complexity;
- the creation of public spaces. Public facilities and social institutions should be utilised as important structuring elements.

Various policies for reconstruction have emerged. The World Bank policy to unify areas through spatial and social consolidation of urban areas aims to reverse space extensive urban growth and to create levels of efficiency, equity and capacity (Hindson, Mabin & Watson, 1993). Activity centres were favoured in America and Australia but they tend to rely on high levels of private car ownership and on the geographical dispersement of activities through the advancement of communication

technology. De-concentrated metropolitan growth in the form of satellite cities was a policy favoured by the South African Government in the mid-80's (Smit and Todes, 1987). A compact but compartmentalised approach representing the management of very large cities with the use of cities-within-cities was proposed by Lauchlin Currie in 1978 (in America). This promoted the development of compact city centres distributed around a central, dominant centre and linked by high-speed movement channels / transport corridors.

The Compact-Integrated Approach based on Activity Corridors was a means by which to promote integration of urban form and complexity and will be described in more detail below. This approach was also taken further by Smit and Todes (1987) to form a Compact-Integrated City - Welfarist Model.

What is important to note about these approaches is that there is a general consensus around the "promotion of a compact / integrated urban form" (Urbanisation Task Group, 1994). Integration has been widely advocated as essential: Chittendon & Associates (1990), Dewar et al (1979), Green (1990), Hindson Mabin & Watson (1993), McCarthy (1994), Naudé (1990), Smit & Todes (1987), Smit Maughan-Brown & Williamson (1993), South African Institute of Town and Regional Planners (1994), Urbanisation Task Group (1994), Western Cape Economic Development Forum (1995) to name a few of the proponents of integrated city form.

The Compact City Approach and the Activity Corridors Theory are the main highlighters of integration as a policy. These will now be detailed as a background to integration.

3.4 Compact City Approach

The Compact City Theory is a relevant one because it is a base from which integration is achieved. Compaction facilitates integration. For this reason it is necessary to detail this theory / approach.

3.4.1 Introduction to Compact City Theory

The Compact City Approach originated chiefly in the United States and Australia around the late 1970's and 1980's. It emerged as part of a critique of urban sprawl and suburbanisation. Decentralisation, it was believed, led to the decreasing 'functional importance' of the inner city as people and jobs moved out of the city (Behrens and Watson, 1993). This outward movement tended to leave the poorer people behind in the higher densities within the city centre[2]. A decrease in inner city revenue was associated with the outward movement of middle and higher income people and businesses. To quote Troy (1992:243) "the (consolidation) policy has its own origins in the fiscal crisis of state and federal governments".

This outward movement of people from the inner cities generated large-scale suburban growth or sprawl. Urban sprawl has been very loosely defined in the literature but it generally refers to the uncontrolled spread of the city into the periphery in an uncoordinated manner. Suburban development tends to consist of detached dwelling units on individual private properties. Urban consolidation, on the other hand, is described as "achieving a greater proportion of future urban growth within established areas" (Collie,1990). This involves large mixed use developments and increases in residential density (dual occupancy and medium density or multi-unit housing development) (ibid). Dewar & Uytenbogaardt (1991:90) identify compaction as "imploding new growth inwards to the greatest degree possible, ... and to reconstruct (the city) ...from within". They, amongst others, argue that a system which works well at a pedestrian scale must be encouraged to evolve.

With an increasing awareness of fiscal and environmental limits of resources, a number of cities (mostly in North America and Australia) adopted measures to compact the cities and to consolidate them. These measures included densification, infill and consolidation. They were primarily aimed at increasing residential densities within the inner city areas through inducement and restrictive measures (Behrens and Watson, 1993).

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[2] In South Africa, however, this was not the case. The poorer people were isolated on the periphery as a result of racial segregation and the Group Areas Act which aimed to exclude people of colour from the urban areas.

What followed was ongoing debate with regard to the costs and benefits of sprawl and compaction. The main issues here included: capital costs, operating costs, social costs, environmental costs, functional costs and opportunity costs.

- Capital costs refer to costs of infrastructure provision, dwelling construction and land acquisition;
- Operating costs of utility services;
- Increased travel costs (in terms of time and money), accessibility and household preferences make up the social costs of sprawl;
- Environmental costs include: land consumption, energy consumption, air quality, water pollution and floral and faunal diversity;
- Functional costs include those incurred by congestion, the costs to economic productivity and costs of consumption of land, energy and water;
- Opportunity costs represented by the trade-offs between compact city advocates (favouring the upgrading of existing infrastructure and internal accommodation of urban growth to be compact and contiguous) versus the anti-compactionists who see compaction as futile, unwanted and as a temporary respite from inevitable sprawl.

During the 1980's and the 1990's implementation of various policies and experience around the world has led to an extensive amount of evidence in favour of both compact cities (to a greater extent) and suburban growth (to a lesser extent).

Concerns of sustainability are used as motivation for the Compact City Approach. Cities are major consumers of resources and major contributors to environmental degradation. Urban development, Breheny (1990) indicates, should be sustainable urban development. Dewar and Uytenbogaardt (1991) state that the compact-integrated approach has at its base the twin concerns of humanist philosophy and conservationist principles. In South Africa a large proportion of the population do not own private motor vehicles. To encourage a compact city form would therefore seem a realistic measure to cater for the pedestrian, cyclist and public transport-dependent urban dweller.

There has been much debate regarding the merits and demerits of this approach (See Briggs, 1994b and Behrens and Watson, 1993 for the main arguments).

Generally, the debates contain very subjective criticisms. Sprawl critics have tended to be methodologically weak while compaction critics have generally been biased towards first world cities.

3.4.2 Compacting South African cities?

In South Africa the Compact City debate became fashionable around 1990. The Compact City form, it is argued, is particularly relevant to the South African situation because of the degree of urban sprawl and segregation apparent in our cities. Dewar and Uytenbogaardt (1991) claim that compaction and densification have as their primary goal the maximisation of the generative capacity of urban systems: to "create qualities of 'city' as opposed to suburbia"(p18). Compaction will provide opportunities for people who were previously excluded through infill and densification. Densification increases the diversity of the urban experience and promotes social interaction. This tends to reinforce and/or promote the vitality and viability of the inner city areas and activity corridors. The higher thresholds created tend to generate economic activity and a finer-grained urban form.

Compaction, it is believed, will help 'normalise' the Apartheid City through the countering of problems created by segregation and fragmentation. Compaction is seen as one of the necessary antidotes to the urban ills of the Apartheid City. The social costs of the 'spread city' provide the most important motivation for a more compact city. Densification, it is argued, will help to urbanise the 'anti-city'. In other words, the monofunctional and monotonous urban environments will be encouraged to develop as more positive, diverse and integrated environments. The Compact City is also seen to be the most sustainable and efficient form of development. It counters the space hungry sprawl of urban areas. Activity corridors are seen by many South African theorists and planners to be a primary tool for the promotion of compaction.

Compaction is said to provide efficient conditions for cost-effective provision of facilities, infrastructure and services. Levels of social and commercial services are much higher and convenience / access is more equitable and greater in more compact urban environments. Public transportation is more efficient and viable in a more Compact City.

It is argued that a Compact City form will stimulate economic activity and interactions because of the wider range of economic opportunities (economic diversification) and the concentration of the market, amongst other reasons. It is also argued that compaction favours small business through the compaction of markets, increased accessibility and the generation of opportunities. This is a desirable aim in South Africa.

Arguments favouring the Compact City are widely applicable to the South African context. It therefore seems to be an appropriate policy for inclusion in policy formation for an approach to restructuring. To quote the South African Institute for Town and Regional Planners (1994:3) compaction should be promoted:

> *"in order to achieve the benefits in terms of efficiency, costs, convenience, resource utilisation (particularly land and energy) and to increase the generative capacity of urban systems."*

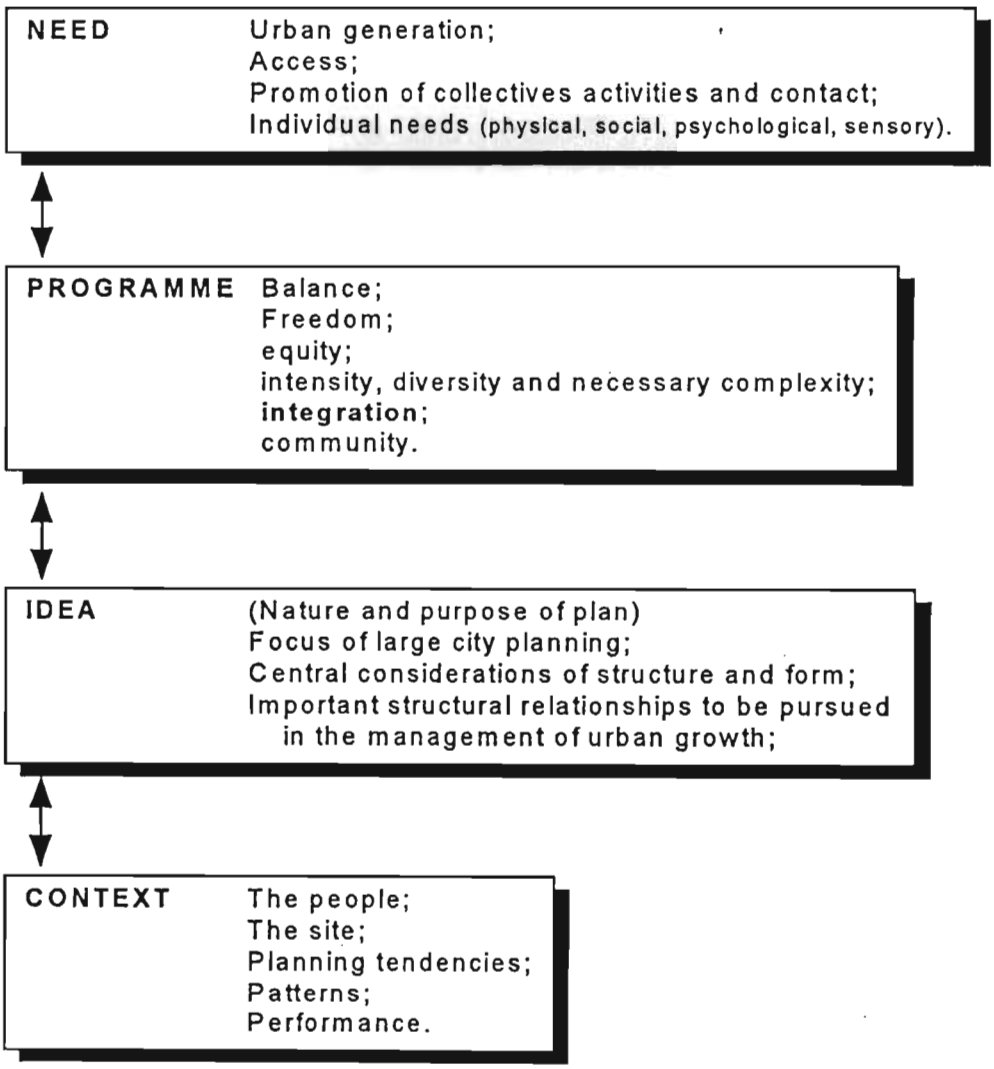
3.5 Compact-Integrated Approach

Dewar at al (1979) expanded the Compact City Approach with what was initially a critique of urban form in South Africa, to form a Compact-Integrated City Approach. This approach was set down in Dewar & Uytenbogaardt's book South African Cities: A Manifesto for Change (1991). The broader concept of the compact-integrated city has been accepted by many professionals and academics in the South African planning world. Detailed contextual analysis and research into the nature of specific interrelationships is still quite recent and is still emerging.

Urban form is an expression of both context (localised influences and consideration) and the contextualisation of abstract ideas of which physical relationships create environments (within which urban life can be lived). That is, there are certain human needs and requirements created by urban dwellers which give rise to an idea of what urban environments should be. These implications for urban form are expressed in terms of performance expectations and standards or "programme". An idea of urban form is therefore created which consists of physical relationships. These physical relationships are informed by both people's needs and performance criteria. The application of these ideas to specific areas and contexts then creates urban form and structure. A simple example: urban dwellers need opportunities to be created for

employment. Both integration and diversity would be performance criteria emerging from this need. An idea for mixed-use developments could emerge which, when translated to a context, could lead to a specific physical reality which promotes these needs. This process is illustrated in Figure 4 below.

Figure 3: Compact-Integrated Approach (Dewar & Uytenbogaardt, 1991)



The approach concentrates on structural relationships which should be utilised for growth management. These are aimed at creating complex environments which are diverse and which generate opportunities. These environments aim to be equitable, accessible, convenient and to celebrate collective 'places and spaces'. Spontaneity, freedom of response, collective dimensions, integration, diversity are some of the key words here.

The integration of urban activities within local areas is identified as a central factor underlying urban performance. Integration is seen as being directly proportional to the generative capacity of the urban system as well as to convenience, efficiency and equity. The main concept is the development of linear activity zones with a rich mix of intensive land uses, referred to as connector routes. These are discussed below as activity systems and are seen to be the most effective way of integrating urban environments.

3.6 Activity Corridors

The express purpose of Activity Corridors to promote continuous urban fabric and to maximise the potential of connector routes, highlights their appropriateness as a base to this study of integration.

Prominent South African researchers support this concept of continuity / integration. A GAPS study (1993) succinctly describes a well-integrated urban structure and form: "all parts of the city are woven together as a cohesive whole" (1993:14); while Green states that Activity Systems should link neighbourhoods as integrators of economic and social life. These comments begin to give an understanding of the potential use of Activity Corridors as major connecting routes and a means by which to promote integration of urban form. Integration is both a goal and an instrument of Activity Corridors.

One consideration central to achieving integration (continuity of urban fabric) is generated by the increase of exposure and access to nature, privacy and community as well as the promotion of interdependence and wider choices created by Activity Corridors.

A second consideration is that there are two main approaches to utilising connector routes as city structuring elements. The first approach calls for a limited number of points which are connected by movement routes, that is, movement is channelled to a limited number of points which represent concentrations or peaks of activity. This approach does not promote integration as fully as the second approach (adopted by this study) which: allows more intensive activities to respond directly to the

movement flows by locating along them. There are a number of advantages to this approach; briefly these include:

1. The generative capacities inherent in urban agglomerations are maximised by channelling the flows along defined routes. Different sized enterprises coexist with a high degree of complementarity and this maximises economic efficiency as well as the uniqueness of place which encourages diversity.

2. Equity is promoted as there is a potential to reach a greater number of people than node-based development. The activities are taken to the people.

3. Greater efficiency for community facilities is generated as there is greater exposure as a result of facilities not being embedded within local residential areas. Public facilities / spaces should be located along routes.

4. A high degree of integration of different types and scales of activity is promoted. A differential pattern of accessibility is created by the confluence of different modes of transportation. "(The) Complex integration of a variety of activities would occur within easy reach of a great many people" (Dewar & Uytenbogaardt, 1991:50).

5. The process of growth and change is effectively accommodated.

The second approach does not disfavour or exclude nodal / concentrated spread but rather recognises that there are always tendencies towards both. These are not opposites nor do they exclude each other.

Activity Corridors require that the more intensive activities are oriented towards the movement channels. This counters planning theories which introvert facilities and intensive activities towards the centre of neighbourhoods. The Corridors Approach also calls for an urban structure which promotes a degree of natural integration between larger and smaller activities.

A final consideration central to integration is the areal pattern of accessibility. This is described in terms of an accessibility web which consists of many channels of urban

energy flows. Urban energy is measured in terms of flows of people, goods and investment. Flows need to be co-ordinated and channelled in order to maximise the potential contained in the collective resources of the city. As wide a range and spatial distribution of opportunities as possible should be created. This would promote the survival of both large and small activities as well as to create complexity and choice over time.

Activity Corridors give an opportunity to provide opportunities to those who have had minimal access in the past. Corridors do not discriminate but serve to generate conditions from which all groups can benefit. To quote a GAPS study (1993:12):

> *"At a time when socio-economic juxtaposition is extremely sensitive, urban corridors are an object lesson in how complex urban structures create equally complex frameworks in which diversity is not only accommodated but actively encouraged and nurtured".*

SECTION TWO: RESEARCH

CHAPTER 4 A THEORY OF INTEGRATION

4.1 Introduction and Definition

The Collins Dictionary definition of integration is to "combine into one whole" or "to unify diverse elements". Nowhere in the literature is the concept of integration explicitly explained and the underlying factors and consequences described. But integration is implicit and part of the Activity Corridor Concept and the compact-integrated approach. The author has therefore extrapolated from the literature various ideas about the concept and what the underlying forces are.

Integration within the Activity Corridor framework (and in this study) refers to the spatial / physical, social and functional interaction between urban activities and the surrounding areas.

Integration is manifest at two scales, the metropolitan scale and the local / human scale, which can be measured by the flows of 'urban energy' in an urban environment. This urban energy, as mentioned before, is revealed by the flows of people, goods and investment.

The ideal integrated environment is one which is highly generative; opportunities are created to which people can respond; it is convenient, efficient and equitable in that people are exposed to a wide range of facilities and activities; and they utilise infrastructure more efficiently (after Dewar & Uytenbogaardt, 1991). The urban fabric is dense and there is a high degree of interdependence. Areas are not entirely dependent on their own resources. Different types and scales of activity occur.

4.2 Motivation for Integration

As mentioned before, integration is a desirable goal of urban form and is particularly relevant in the South African case. To quote Chittendon & Associates (1990:9) "Integration of the various components of the city is considered a key element in the process of seeking a solution". Possibly the most important consequences of an

integrated system are the conditions of urbanity which are generated. As stated by the South African Institute for Town and Regional Planners (1994:3) integration maximises convenience and vitality and releases the "economic, environmental and recreational synergy which potentially exists". Diverse and exciting environments are created, with high levels of accessibility and opportunity for all. Integration highlights the need for a comprehensive perspective of the city as one interdependent system rather than a conglomerate of parts.

Chapter 3.6 **Activity Corridors** details the main characteristics of Activity Corridors as integrators and city structuring elements and illustrates that integration is their main goal. Opportunity is created "by exposing (local inhabitants) to people and forces from beyond, it *(the activity concept)* also integrates local areas into the city as a whole" (Dewar & Uytenbogaardt, 1991:49 - italics added). It is through Activity Corridors that the complex integration of a variety of types and scales of activities occur within easy reach of many people. Integration allows for the maximisation of choice by enabling different activities to overlap or be near to each other (Chittendon & Associates, 1990). This integration of different uses and activities allows for the social, cultural, commercial and other functions to become more integral parts of the life of the community.

The GAPS study illustrates the need for an integration-oriented approach. They comment:

> *"We have to achieve integration in order to promote access to opportunity, divert disposable income from commuting into housing and education, eliminate the social costs of excessive commuting and improve the city's cost effectiveness and efficiency" (1993:18).*

Linkages and integration of activities have yet another role to play in addressing gender inequalities. Land use separation is a major restriction which leads to the separation of women from the workplace, thereby preventing them from becoming involved. The separation of employment, shopping, services and facilities from place of residence imposes constraints on women particularly in terms of time.

Apart from spatial advantages, integration is an economically sound principle. Opportunities for small businesses and informal traders (and for those who wish to work from home) are facilitated by a highly integrated urban environment. One of the

goals of the local economic development of the City of Durban is the improvement of linkages and integration of activities (McMenamin & Prinsloo, 1995).

Public transport is promoted by the interactions and channelling of people and goods within the system. With the concentration of the more intensive activities and higher density land uses towards a central spine, thresholds for public transportation are greatly increased. This then enables the provision of public transportation and facilitates integration between local areas and the metropolitan region as a whole. Integration allows different functions to not only work well themselves but also to actively reinforce each other. It is important that complexity of integration is achieved. Urban activities are naturally complex and cannot be compartmentalised into simple spatial parcels.

Significant income leakage is also prevented as more opportunities are provided on a local scale. The extroverted nature of the areas mean that the facilities and activities enjoy a higher level of threshold (and so can be provided in the first place!!) and interaction is increased. Integration encourages attention to focus on the "collective dimensions of urban life" (Dewar & Uytenbogaardt, 1991:56) and public spaces are probably the single most important infrastructural element here.

4.3 A Theory of Integration

The concept of integration is a component of most reconstruction policies and discussions in South Africa. There are different perspectives of integration and the term can be applied to a wide variety of conditions. Naudé (1992:39) for example, explains integration as occurring:

> *"partly through the establishment of hierarchical ordering and control structures, and partly as a result of lateral or diagonal linkage mechanisms such as market contracting, social networks, communication networks, and multi-functional activity corridors".*

It is for this reason that this study concentrates on three main perspectives: spatial, functional and social integration. These are believed to contain the major issues on integration into manageable categories.

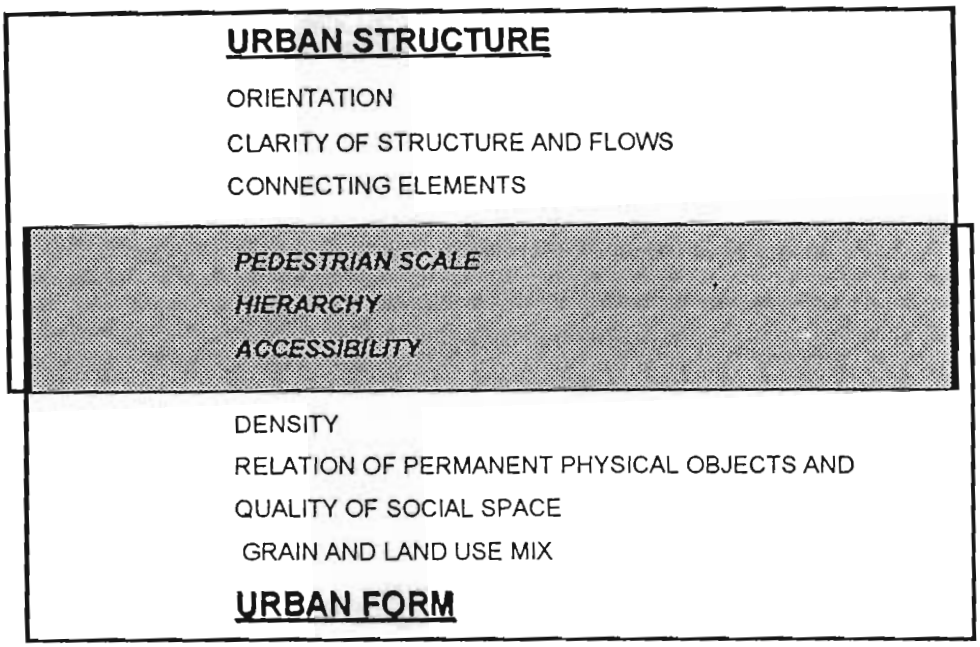
4.3.1 Spatial Integration

Spatial integration refers to the physical connections and linkages which exist between the residential land uses and the land use activities on the activity spine and the spatial organisation of all these. The spatial dimension can be analysed by looking at the urban structure and form. Structure and form are essentially interrelated and a part of each other but can be separated, to a degree, for analytical purposes. Urban Structure refers to the spatial distribution of activities, land uses, flows and interactions and the patterns created by the connecting elements (transport links, parks, public spaces, etceteras) as well as how they relate to each other. That is, structure is the spatial geometry or layout.

Urban Form refers to the spatial pattern and to how the different permanent physical objects (buildings, streets, utilities) look and stand in relation to one another. This relates to the height, size and shape of the urban environment. In the words of Banz (1970) "urban activity may ... be integrated to any desired degree through the corresponding integration of urban form" (p144) and "to be relevant, urban form must integrate a wider range of functions" (p146).

In order to come up with a classification of "characteristics" of spatial integration it has been necessary to break down the elements of urban structure and form. Figure 5. below illustrates what the study identified as the main issues / components - or categories - of structure and form. There are those elements which are applicable to both as they cannot be separated (shown in italics).

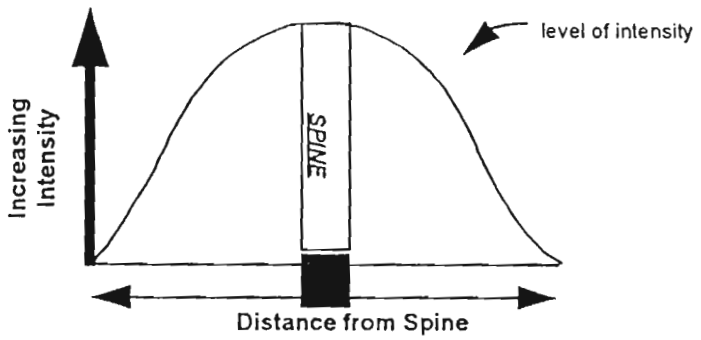
Figure 4: Elements of Urban Structure and Urban Form



❑ *Orientation*

An important requisite for integration is the orientation of land uses and activities onto / towards a connector route / spine. Higher intensity land uses, and those uses and facilities which generate a lot of activity, should be located within an activity corridor. A spatial ordering principle is then generated by which the spine becomes the distributor and collector of movement.

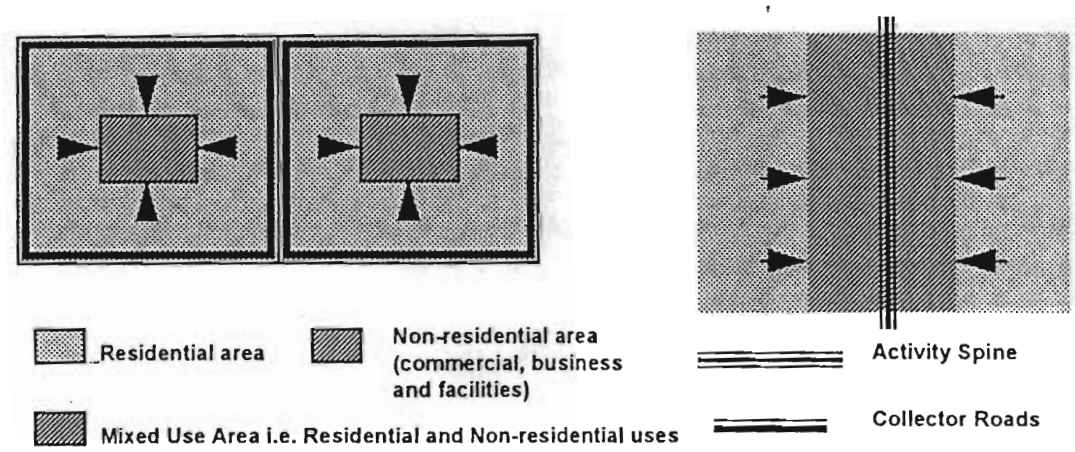
Figure 5: Orientation



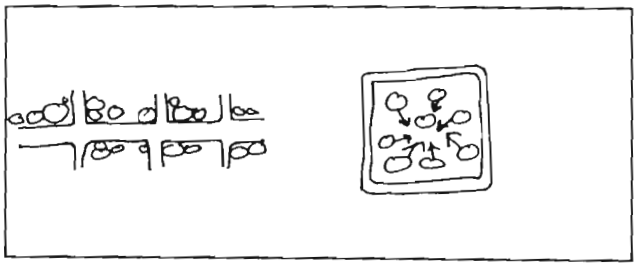
Traditional layouts orient residential neighbourhoods inwards through the internalised location of activities and the street layouts (Green, 1990). Adjacent neighbourhoods therefore, are not integrated with each other as well as with the metropolitan area as a whole. This inward orientation has prevented the creation of economic thresholds as it prevents sharing amenities, opportunities and access with passing traffic.

Integration needs to occur between the daily movement of people (between areas) and the residential areas so that the necessary thresholds can be created. Opportunities and facilities can then be created from which all urban dwellers can benefit.

Figure 6: Orientation, Neighbourhood Units and Activity Spines

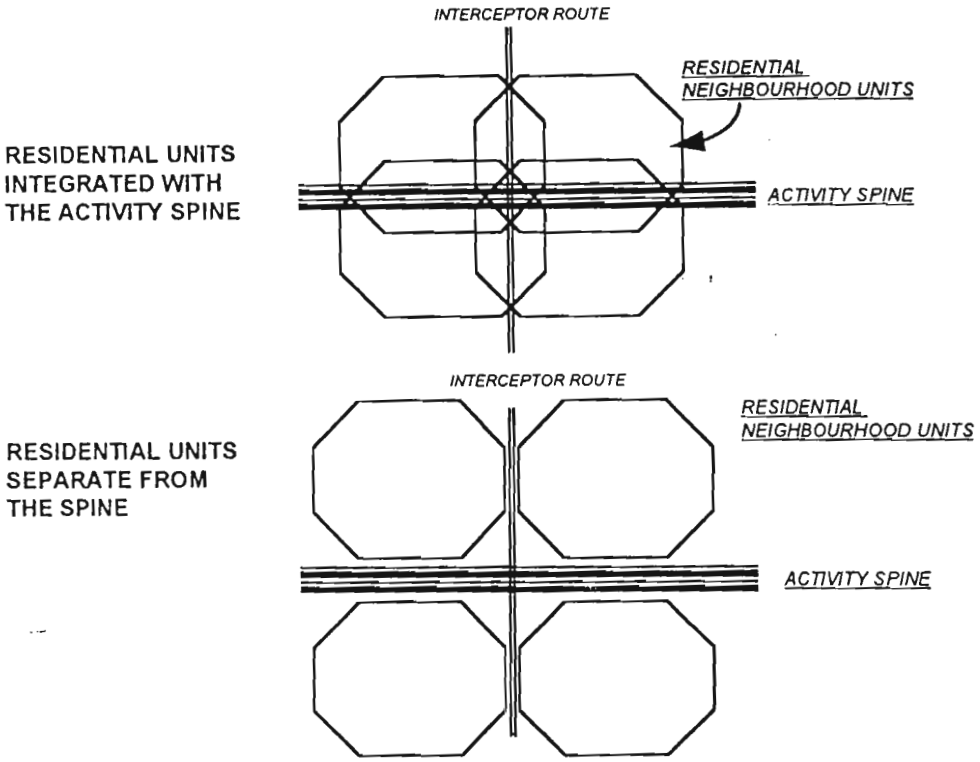


This does not mean that the neighbourhood concept has to be ignored completely, but it does mean that design should locate the high intensity (traffic generating) functions along the activity routes. With the orientation and location of facilities, activities and intensive land uses within Activity Corridors, the corridors are then able to act as integrators and connectors. Integration with a larger metropolitan area opens up opportunities as a higher threshold is created. These opportunities would not exist if facilities were deeply embedded in a residential area with no exposure to external opportunities. For example, by locating shops within an activity corridor the threshold of a larger area can be used. This then serves to integrate the area with a wider one and enables them to enjoy a far wider range of goods than would otherwise be the case. This can be contrasted to the layout of shopping centres which are internally oriented and which promote private transport.



Residential land uses should form a component of the land use mix along the spine thus weaving a spatial connection between the different land uses. This is illustrated in the conceptual diagram below:

Figure 7: Levels of Integration With a Spine



In the top illustration of the above figure, the residential units are designed as part of the spine, thus spatially integrating the residential land uses with the spine and making the residential component an integral part of the spine and its activities. In the second illustration the residential units are designed in isolation from but alongside the spine and are therefore not integrated with the spine.

The opening up of opportunities from an integrated environment improves the adaptability and life-span of the urban environment. In separate neighbourhoods, the centrally located facilities may become redundant as the profile of the neighbourhood changes. The primary school in the centre, for example, becomes under-utilised as the population grows older. If these facilities are located within the corridor they are then exposed to a far larger socio-economic mix and are utilised to a greater extent. The spatial integration of the neighbourhood and facilities with the metropolitan area, and vice versa, is then facilitated by the orientation of these facilities / activities onto the spine (see Figure 6: Orientation, Neighbourhood Units and Activity Spines above).

❑ *Clarity of Structure*

Orientation is influenced by clarity of structure. The Activity Corridor as a connecting route must be a natural focus for activities and land uses. Lynch (1960) describes the absolute importance of clarity and 'legibility' and the need for the different parts of a cityscape to be easily recognised and organised into a coherent pattern. Districts, pathways and landmarks should be easily identifiable and grouped into an 'overall pattern'. This will reinforce the structure of the urban environment over time. This concept can be extended to the metropolitan scale.

Clarity of structure relates to functional integration as it allows intensive activities to naturally gravitate towards the spine. This then produces a higher level of service and multi-functionality which facilitates functional integration.

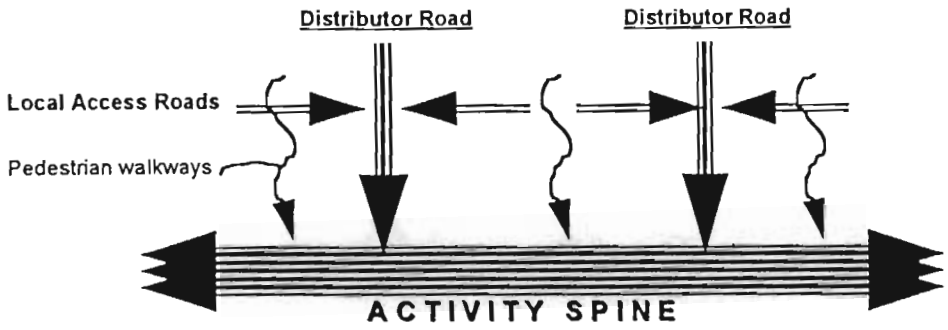
❑ *Connecting Elements and Flows*

The nature and form of connecting elements is an important consideration if integration is going to result. Paths are best described by Lynch (1960:96) as the "most potent means by which the whole can be ordered". Connecting elements include transport links, parks, squares and public places. The patterns created by these indicate the nature of flows and the nature of the urban environment. The most significant and perhaps the most noticeable of these are the transport links.

The nature of the movement channels which exist between different areas, activities and land uses significantly influences the degree to which they are integrated with one another. For example, for a residential area to be spatially linked to a spine it needs to be linked by efficient, appropriate and effective movement channels. A clear hierarchy of movement channels must be set up with the activity spine being the dominant transport route.

For Activity Corridors to serve as integrative routes they need to be major through routes and stop-start movement of the traffic should be enabled. The vehicular traffic should be reinforced by other forms of accessibility, namely pedestrian walkways, interconnecting roads, public transportation and rail.

Figure 8: Connecting Elements and Hierarchy

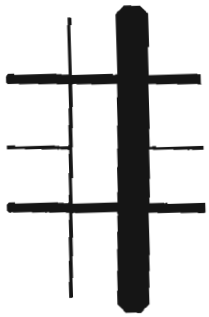


❑ *Pedestrian Movement and Scale*

As mentioned above, clarity of structure is directly related to the degree to which the corridor / spine integrates areas and communities. An important consideration here is the pedestrian movement channels. Urban environments should be scaled to the pedestrian. Corridors should be able to provide daily requirements and a wide range of facilities and activities within walking distance of residences. If not, they should at the very least be able to provide public transport for access to these facilities and activities. The corridor should serve to integrate local communities with the urban area as a whole by providing pedestrian access to a variety of public transportation modes. The pedestrian routes should be linked to bus stops.

The design of the streets themselves influences their suitability for pedestrian traffic. Pavements should be wide enough to accommodate pedestrians as well as invite them by containing benches, trees, etceteras. The location of public spaces along routes would contribute to the vibrancy of the area and encourage pedestrian activity. A good spatial mix of people-oriented land uses in close proximity to residential areas would encourage pedestrian activity. This activity contributes to the vibrancy of the area by providing custom for other activities. For example, the spatial location of a chemist, doctor and shop near to each other would mean that when walking to the doctor (because he is so close), one can also collect prescribed medicine and do the grocery shopping at the same time.

❑ *Hierarchy*

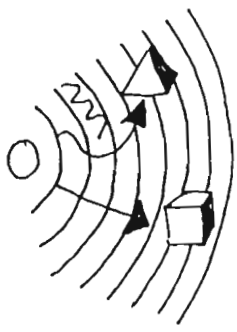


Another important element of these transport links is the hierarchy of the connecting elements (see Figure 8: Connecting Elements and Hierarchy above). The activity spine must be the dominant route. This is reinforced by density and, once again, the clarity of structure. Lynch (1960) describes a visual hierarchy of streets / paths as "the skeleton of the city image" and as a "sensuous singling out of the key channels, and their unification as continuous perceptual elements" (p96).

A strong hierarchy will channel movements and activities towards the spine. The more intense activities will respond to this hierarchy by locating along the dominant route / spine. The higher densities will also locate at the most accessible points. This in turn leads to the creation of a hierarchy of density patterns as well. Nodes of activity will develop at convergence's of movement, that is street intersections. If activities are left to respond to the hierarchy then an ordered spatial layout will result which is readable, convenient and which provides choice. The land uses further away from the spine will be 'protected' as the hierarchy acts as a magnet for activities. This enables people and land uses to choose what levels of activity and density they wish to be part of.

A modified grid pattern should provide an enabling and readable spatial pattern. This layout pattern provides a range of alternatives and a variety of conditions as small changes, in both scale and configuration, can lead to different conditions. This encourages diversity (and therefore adaptability) and allows for a range of opportunities. Integration is improved when opportunities are created as interaction is facilitated.

❑ *Accessibility*



Interaction, and therefore integration, is also related to levels of accessibility. There are many dimensions to accessibility, for example access to facilities, access to the spine, access to the metropolitan region, access to public transport, etceteras. Facilities in a corridor must be visible and directly accessible. Access is facilitated by hierarchy, the existence of clear, well-defined movement channels and particularly by the urban area being scaled

to people. If activities are located within the corridor, they are in walking distance and are therefore spatially accessible. A clear structure and hierarchy will mean that there are no spatial barriers to accessibility.

Accessibility also introduces a link with functional integration. Multi-functionality of an urban area increases people's access to a wider range of goods and services than would normally be the case. Integration and accessibility thus go hand-in-hand. If an area or facility / activity is accessible then integration will occur between the areas of users and area.

❑ *Density*

Density is also an important factor - the higher density residential areas should be located along and oriented to the spine. This provides a logical spatial ordering device and improves the clarity of the urban structure. Cohesiveness and clarity relate to hierarchy as the spatial ordering of densities and land uses can be seen as a specific hierarchical ordering.

The density gradient, therefore, should be highest abutting the spine and then decrease away from the spine. The higher densities nearer the spine would generate thresholds and therefore facilitate the location of diverse activities along the spine. The density patterns also reinforce these routes as more important on the hierarchy. This spatial organisation encourages activities to turn to and locate along the spine. There is a direct relationship between residential densities and intensity of land uses and activities. This is integration.

Most of the literature calls for high densities in the form of 3-4 storey walk-ups and attached housing. It has been generally agreed that gross densities of 50 - 100 people per hectare should create the necessary thresholds for activity corridors. This translates to an approximate net density of 200 - 225 people per hectare or 40 dwelling units per hectare (depending on family size).

❑ *Relationship Between Permanent Physical Objects;*

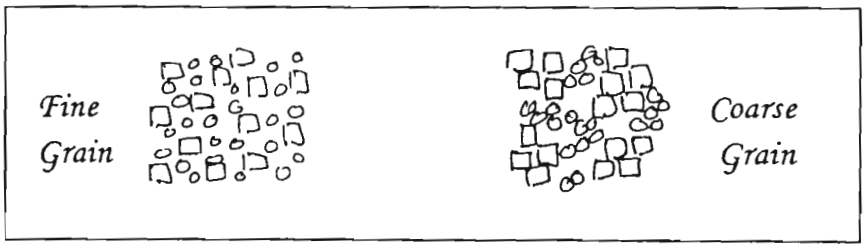
Quality of Social Space

The relationships between the permanent physical objects is a consideration of urban form which can have an influence on levels of integration. From the discussion above - integration between residential and high intensity land uses and activities is facilitated by the nature of interfaces. It is important for the requirements of both uses, users and public spaces to be considered and the areas of responsibility to be defined. The quality of social space affects the levels of integration of different uses and housing types. Rhythms of social space are enhanced by different building heights. The different uses and housing types have different operational requirements with the street. Integration, as mentioned before, is directly related to diversity.

❑ *Grain and Land Use Mix*

Diversity of urban form is therefore created by a strong mix of land uses. If there are limited constraints on land use types and if there is an enabling environment, then land uses will naturally be varied. That is, if activities and uses are left to respond to the specificities of location, then it is natural that different uses will locate at different sites. Each use has its own locational requirements. This should automatically lead to a variety of land uses locating along the spine. Mixed land uses will be discussed below.

Land use mixes also influence the grain of the environment. The spatial mixing of urban elements extends beyond land uses. If there is a fine-grain mix of activity, "production, consumption, residence, education, and creation go in each other's presence. No one need travel very far to engage in any of these activities, although anyone may range widely if she wishes" (Lynch, 1981:301). Grain is a feature of texture and describes the mixing of different elements (people, activities, building types, etceteras) in space.



A fine grain refers to the wide dispersion of 'like' elements among 'unlike' elements (Lynch, 1981). South African city form generally displays a coarse grain where "extensive areas of one thing are separated from extensive areas of another thing" (Lynch, 1981:265). An integrated urban environment is one which displays a fine grained urban fabric.

4.3.2 Functional Integration

[Refer to Plan No.15]

The dictionary definition for functional is: "having a special purpose". This in itself highlights one of the main obstacles behind functional integration and that is the emphasis on 'function' - that is, the singular purpose. The separation of land uses and functions is what kills the potential for diversity and integration; and stifles the potential opportunities create in urban environments. Thus the concept of multi-functionality is an important one. For integration on all levels (spatial / physical, social and functional) to occur, conditions of diversity need to exist. What is meant here is that spatial, social and functional integration are closely related. A strong bond is that created by diversity. Diversity in urban environments is created by large numbers of people being close together and who have so many "different tastes, skills, needs, supplies, and bees in their bonnets" (Jayne Jacobs, 1961:159) that they create the conditions that generate diversity.

Another spatial / physical influence is that of hierarchy and clarity of structure. When present, intensive activities gravitate and therefore generate a higher level of service. Non-residential functions are thereby complexly integrated with the residential fabric.

Functional diversity can be manifest in different ways. Primarily, in this study, the focus is on land use multi-functionality (mixed land uses being the main element) as well as multi-functionality of movement channels. It is first necessary to define more closely what is meant by mixed land uses.

- ***Mixed Land Uses:***

  'Mixed land uses' refers to a multi-functional use of space. Simon (1989:43) describes two spatial forms of land use mixing:

  1. **The simultaneous use or occupation of a building or single site by two or more uses (either compatible or non-compatible); and**
  2. **The use of adjacent sites by different land uses.**

  There are different variations of land use mixing on the same plot. There may be:

  1. **Horizontal mixing (back / front);**
  2. **Vertical mixing (different floors); or**
  3. **A combination of the two.**

  Simon (1989), from his findings in Nigeria, states that land use mixing is 'socio-economically desirable'. One of the principles underlying desirable land use mixing is compatibility - complementarity and harmony between the land uses - another principle identified was the importance of the planning / development of sites to adequately contain the multiplicity of uses intended as well as to accommodate any ancillary requirements for circulation, parking and storage (Simon, 1989:49). Land use mixing was identified in areas which exhibited high levels of accessibility and attracted large influxes of people. This is an important requisite if mixed uses are to generate the thresholds necessary to support and maintain activities, especially if these activities are of a commercial and service nature.

Activity corridors and mixed land uses benefit each other. Mixed use development introduces diversity and therefore interaction. The presence of economic opportunities, commercial, social and cultural services and public transportation systems within walking distance of residential areas is an important characteristic. In his study most of the references to mixed use refer to the mixing of residential with economic uses.

Mixed uses are necessary to stimulate the conditions of diversity and urbanity as well as to provide the many opportunities for Activity Corridors. The corridors themselves provide the thresholds necessary to support the mixed uses.

❑ *Diversity*

Jacobs (1961) states as her first condition of diversity, that districts (and their internal parts) must serve 'more than one primary function'(emphasis added) and preferably more than two. Essentially, land uses should not be separated to the extent that they

are in South Africa. The land uses are strictly regulated by land use zoning regulations which has led to monotonous and monofunctional areas. Broadbent (1990:196) citing Leon Krier, claimed that "(t)he most destructive force ... had been the zoning of cities into areas of different functions: sleeping, working, consumption". Zoning practically inhibits the potential for opportunities to be created. Home businesses, for example, are prevented which could provide an important source of income and service.

Diverse environments are positive environments - because of the wide range and scale of goods, services and activities, they cater for a wide range of people. This on its own generates high levels of activity which, in turn, reinforces these activities and the spine as their natural focus.

Different land uses have the ability to attract people on 'different schedules' for 'different purposes' (but for using the same facilities) and thus create active and diverse environments. Activity Corridors need diversity to achieve their aim of creating conditions of urbanity, and thereby integrating the city and local areas into a whole.

This concept interacts with grain, hierarchy and clarity of structure in that, given a spatial skeleton with a clear hierarchy and left to respond to specificities of place, different activities will locate at different positions. This would create a mixing of activities as each responds to a specific locale (street corner, spacious mid-block, away from spine, etceteras). Given a clear structure this should generate a distribution of activities and a fine-grained structure. In this way spatial and functional elements inter-relate in such a way as to generate integrated environments.

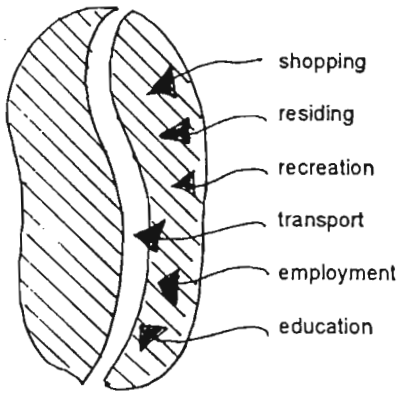
There are certain groups or kinds of activities which attract people to them on a regular basis. This study refers to people-oriented activities and non-people-oriented activities. People-oriented activities include convenience, durable and specialist goods as well as particular services. The types of goods range from food (perishables, specialist, etceteras) to clothing, durables (pots, blankets, hardware, etceteras) to specialist goods. Medical, financial and other specialist services are also 'people-oriented'. Entertainment based commercial activities can also be included here - restaurants, casinos, bars, etceteras.

Non-people oriented activities would include offices, wholesale / distribution firms, warehousing and manufacturing activities. These do not attract a flow of local people on a regular basis. Certain specialised commercial services can also be included in this category: motor-vehicle retail stores, for example, do not draw a significant flow or range of people from their immediate areas.

❑ *Multi-functionality*

Multi-functionality is the essential component here. Mixed land uses attract a mixed bunch of people for different reasons. Multifunctionality leads to different uses of facilities and public spaces at different times depending on the time-cycles of use for the various users. This is closely linked to social integration where a range of socio-economic groups create diversity in demand and supply of goods and services. It is also linked to physical and spatial integration, for example, where it is important that conditions are created which would attract both larger enterprises and smaller businesses.

Thus multi-functionality leads to a mixing of land uses, people and economic activity. The degrees of interaction which result serve to integrate the various components of the urban environment. The integration of different uses and activities works well as they reinforce each other. Flows of people, goods and investment are many and diverse.



Activities which occur within urban environments include: residing, working, shopping, moving and recreating. Activity Corridors should offer a wide range of opportunities within the closest physical proximity possible. Activity Corridors, therefore, should contain a range of land uses: retail and commercial activities will attract shoppers from both a local and metro scale. Employment opportunities are provided by light industry and general offices, for example. This economic activity includes formal / informal, skilled / unskilled and home-based employment opportunities.

Service activities will also attract people on a daily basis. Cultural, entertainment and mixed uses with a residential component will attract people to the area over a wide

range of time (i.e. including evenings). Education and religious facilities will draw people in to the area thus increasing activity and the thresholds for different activities.

Not only will a mixture of land uses promote interaction but the actual uses themselves become multi-functional. In an integrated environment a shop, for example, can facilitate communication and recreation as well as the purchase of goods. Public spaces become meeting places and not just empty areas for passing through.

❑ *Performance of Activities*

Integration of different land uses and activities affects the performance of the activities themselves. "Social, cultural, commercial and other functions become much more integral parts of the life of a community when integrated into the fabric of that community" (Dewar et al, 1979:12). Multi-functionality is especially desirable in low income areas where, for example, a school facility can be used as a social facility, a recreational space and a place of worship.

An essential principle here is land use complementarity. Land uses have positive and negative externalities. Externalities are impacts / influences on their surrounds (both direct and indirect) and environment. In terms of adjacent land uses the location of a casino and night-club adjacent to dwelling units would generate negative externalities for those residents - noise and traffic late into the evenings.

A good measure of negative externalities is to look at the land use and to identify if its location at a specific place would cause any harm or make anybody, use or place worse off. Different situations vary - the casino, for example, would be well placed next to a restaurant. Positive externalities would result as they would provide custom for each other.

The nature of land use complementarity changes over time. Zoning controls had their place when applied to segregating large-scale, noisy, polluting, heavy traffic-generating industries from residential precincts. "But in the age of electronics when so much can be done at a small scale, where the factory itself may be a small, clean, quiet, neat and tidy place" (Broadbent, 1990:141). This forced separation of land uses becomes invalid. Land uses are no longer as incompatible. Improved

technology therefore allows for more mixing of place of work with place of residence. Land use complementarity then provides a useful tool for the control of land use mixing. This will be discussed later.

An activity spine should give people choice over the levels of mixing they wish to be subject to. If the spine is a strong spatial focus then the 'heavier' land uses should orient towards the spine. This then 'protects' the residential areas behind. Levels of mixing should decrease in intensity from the spine.

- *Transportation*

With the activity generated from mixed land uses public transportation becomes viable. Public transportation, whether it be train, bus or taxi, creates links between the local residents and the metro area as a whole, as well as links between people from all over the metropolitan area and the activities / opportunities along the spine.

It is important for the actual spine, and the movement channels in general, to be multi-functional, that is, multi-modal. In other words the streets should not be designed for motorised transport alone. There has been a strong planning focus on the private vehicle which calls for an emphasis on movement, with minimal interference and intersections. These streets are not pedestrian-friendly, with narrow walkways and fast-moving traffic which makes crossing over a risky event. With Activity Corridors the movement channels should be designed for the pedestrian as well as public transport and vehicular through-traffic. Roads should also play a social role. The walkways should be sufficient to enable convenient use by pedestrians. There should be adequate links off the Activity Corridor onto a high speed route. These channels of movement and 'traffic' on whatever scale are what integrate the different land uses and activities with each other.

4.3.3 Social Integration

❑ *Socio-Economic Profile*

Social integration is based on the need for a strong mix of socio-economic types within an Activity Corridor (residents and through-traffic). The socio-economic profile of a residential area influences to an extent the nature of activities occurring within the corridor. The volume and type of goods demanded is affected by the income level of the population living within the range of businesses. If, for example, the residential area consists of a primarily lower income group, then the demand for certain higher-order goods will be reduced. That is why integration of the urban fabric is a desirable goal. With integration there is a wider mix of socio-economic groups and higher levels of services and activity can be supported. Thus integration gives the poor access to facilities which they would need on a less than daily basis: examples may be banks, building societies and petrol filling stations.

The household profile of an area is also an important factor. The threshold of facilities is affected as demands for facilities change according to stage of life and family size, culture and level of education. The successful Activity Corridor Concept depends on a mix of socio-economic groups in order to benefit the lower income groups. There are divergent needs for the different stages of life. Exposure to a larger population, through integration with neighbouring residential areas, means there is less chance of facilities becoming redundant as needs change. This ties in with spatial integration and the extroversion of residential neighbourhoods. Figure 7 above illustrates integration between neighbourhoods and a spine.

❑ *Safety and Security*

There are also certain social requirements of urban environments which need to be fulfilled in order to promote integration. Environments should be made as safe and secure as possible as well as offer convenience, choice and a balance between community and anonymity. Safety and security can be advanced by increasing surveillance. When there is interaction between different members of the community, safety is increased. Diverse and mixed-use-rich environments generate safety as they integrate areas and thereby increase levels of activity. People are constantly interacting with a wide range of activities over a range of time. To quote Broadbent (1990:139) "A well-used street is also likely to be a safe street". If there is a strong

sense of community in an area, levels of safety are increased because people tend to 'look out' more often. Surveillance and therefore safety is increased. Community coherence is reinforced by interactions generated in multi-faceted environments.

- *Interaction*

The location and nature of facilities available in the corridor will influence the degree of social interaction. If facilities are located within the corridor, then this will generate interaction between different areas. The corridor enables different people from different neighbourhoods to come together to use the same facilities.

Diverse environments with a clear orientation of activities to the spine will give people choice within their environment. The spine and its spatial structure facilitates a degree of complexity within which social integration can occur. Cullen (cited in Broadbent, 1990:222) states that the objective of urban areas is to "suggest that pleasant degree of complexity and choice which, although it is contained within a coherent framework, allows the individual to find his personal path. ... this degree of personal initiative, both socially and visually, helps to identify a person with his environment".

The multiplicity of interrelationships between the different elements of urban environments and urban life must be recognised for integration to occur. The planning focus on separate uses and activities needs to move to a focus on integrated and facilitative planning.

The spatial, functional and social integration, as described above, need to take place. The identification of integrative elements in urban environments requires a comprehensive analysis. The exact nature of the analysis will vary according to context.

This theory on integration provides the base for the analysis of the two case study areas. Using the summarised issues below, this theory can be used for analysis of practically any area. The nature of integration may differ between areas and so issues may have to be added to this list and some may have to be modified. Nevertheless, this is considered an adequate collection of relevant issues.

SPATIAL INTEGRATION

- Orientation
- Clarity of structure
- Connecting elements and flows
- Pedestrian movement and scale
- Hierarchy
- Accessibility
- Density
- Relation of permanent physical objects and
- Quality of social space
- Grain and land use mix

FUNCTIONAL INTEGRATION

- Diversity
- Multi-functionality
- Land use compatibility
- Transportation

SOCIAL INTEGRATION

- Socio-economic mix
- Household profile
- Safety and security
- Interaction

It is important to note that these issues may be listed separately but they each influence the other. The inter-relationships between them are complex and cannot be viewed completely in isolation. There is a certain amount of repetition within the analysis - this cannot be avoided because of the nature of the links between the different elements.

CHAPTER 5 ANALYSIS

5.1 Introduction

In the Durban Metropolitan Area, the R102 (South and North Coast Road) links Amanzimtoti, from the south, and Tongaat, from the north, to the Durban CBD. This transport route was the original main route and is characterised by a wide mix of land uses along its length and is bordered by (non-continuous) concentrations of intensive commercial and industrial activities.

The R102 has been described as an activity system in its early stages and is presently under investigation by the City of Durban (see Seneque Smit Maughan-Brown, 1995 and Seneque Maughan-Brown SWK, 1995a/b/c). It was considered pertinent to identify two segments of this system for analysis. The section of the R102 which runs along Umgeni Road was identified in the north of Durban. In the south of Durban, the section which travels through the area of Clairwood was identified as appropriate for study. These spines have mostly been referred to by their local road names (that is, Umgeni Road and South Coast Road) instead of the R102. They are also referred to simply as spines.

5.2 Intention

It was intended that the case studies would be able to illustrate some of the dynamics of Activity Corridors and dynamics underlying integration, or the lack thereof.

The areas chosen were deemed appropriate for a number of reasons. The first prerequisite was that they be located along the R102 Activity Corridor. The second requisite was that they contain as best a mix of land uses as can be found along the corridor. Areas that were considered central business districts were excluded.

Umgeni Road extends from the CBD, but the segment of Umgeni Road chosen is considered far enough from the CBD to be owner of its own dynamics. Of course, all the areas are inter-related, that is the nature of the "Corridor" but the study area is located in an area which cannot be considered an extension of the CBD.

The two case study areas were therefore considered appropriate for the purposes of the study.

5.3 Umgeni Road

5.3.1 Study Area Definition

Plan No. 2 indicates the study area which is approximately 130 hectares and has a total population of about 5400 people. Its eastern border is defined by the railway lines. Goble Road forms the northern border of the area. The southern border is formed by Churchill Road. The eastern border is defined by Rosetta Road, a section of Innes Road and Sir Arthur Road / Venice Road.

5.3.2 Introduction

Umgeni Road is located a few kilometres from the city centre and is an area of high levels of activity and intensity of activity. The study area consists of a range of land uses - it is predominantly service industrial, commercial and retail in nature; it is also part of a major public transportation route. A large amount of land use is dedicated to used car sales and motor industry-related services and retail. The railway line which runs on the eastern side forms a major boundary. Umgeni Road itself provides an important link between the Economic activity to the North (Springfield Park, Briairdene, Avoca, etceteras) and central Durban.

5.3.3 Sub-Regional Location

From the north of the study area, Umgeni Road feeds out and splits in two directions: North Coast Road (R102) and Springfield Flats (M19). Umgeni Road is the main link between the industrial and economic activities located along North Coast Road, Avoca and Springfield Industrial Park. The extension of Umgeni Road down the Springfield flats provides an important link to the M19. The M19 is a freeway which interchanges with the N2 north-south freeway and ends in Pinetown and New Germany. This is an important factor in explaining the heavy traffic along Umgeni

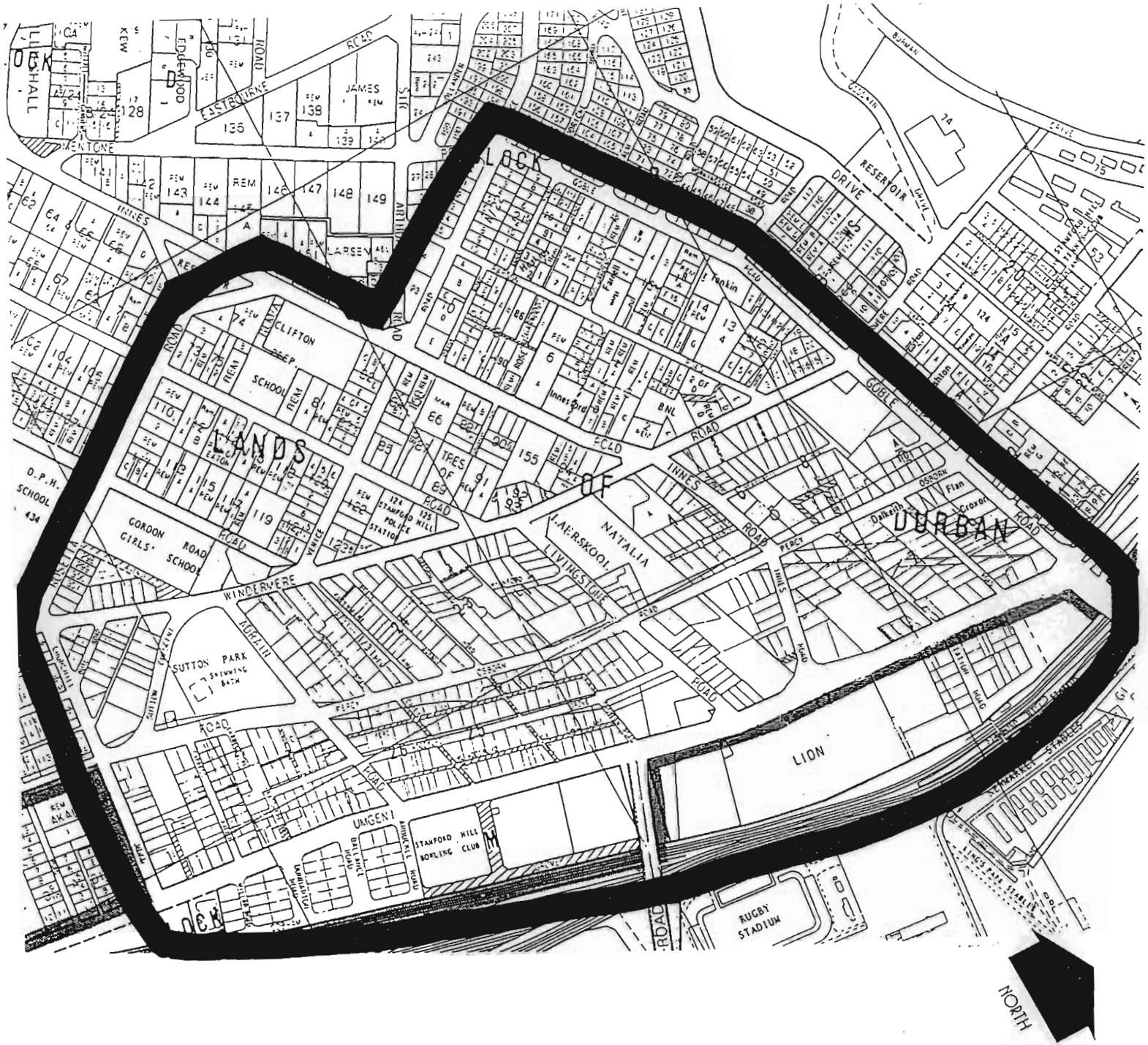
Road. From the south of the study area, Umgeni Road heads straight for the CBD. The Durban station is located just over a kilometre from the study area.

The Athlone Drive interchange provides a connection with the NMR Avenue. High levels of traffic move from the Umgeni Road / Goble Road intersection to the NMR Avenue. The Walter Gilbert and Umgeni Road interchange also feeds onto the NMR Avenue as well as onto the northern freeway.

These intersections also lead to the recreational-facility-rich area to the east of the study area. Along this area (see Plan No. 3) are: the Kings Park Soccer Stadium, Kings Park Rugby Stadium, Kings Park Athletics Stadium, International Swimming Baths, the Village Green and Animal Farm, The Durban Country Club and Golf Course, the Windsor Golf Course and Mashie Course as well as the Newmarket stables and Cyril Geoghegan Cycle Track. These represent a major concentration of metropolitan scale recreational facilities.

UMGENI ROAD

PLAN NO. 2
STUDY AREA



PREPARED BY.	LISE C. LILLEBY
DATE.	DECEMBER 1995
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5.3.4 Analysis of Integration

To be read in conjunction with Plans No. 3, 4 and 5 located after 5.3.4

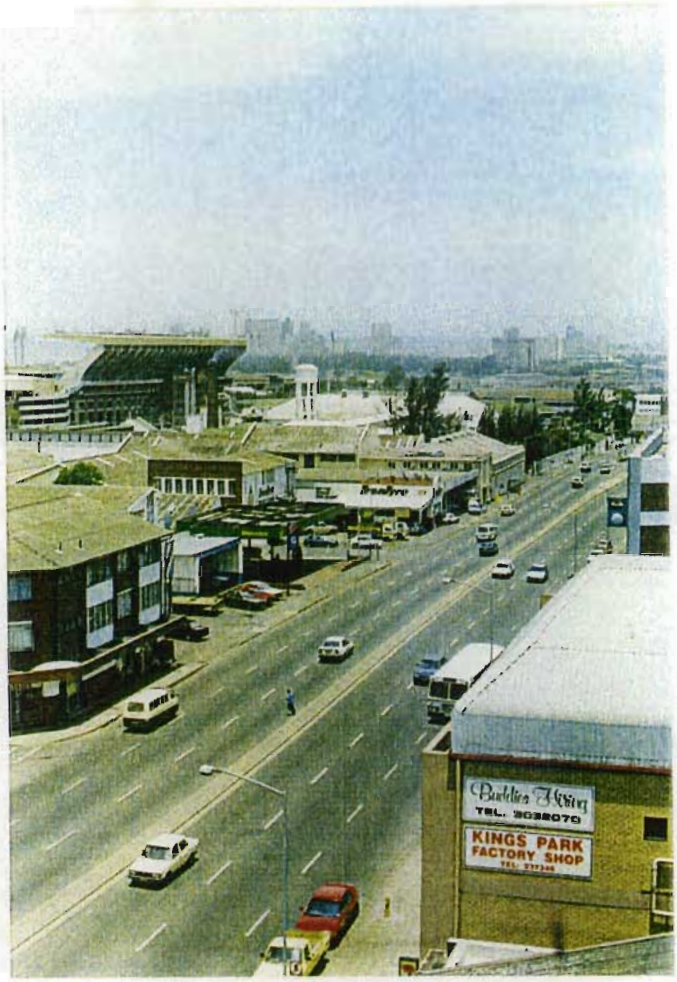


Photo No. 1: View of the Umgeni Road Spine From the North

5.3.4.1 Spatial Integration

[Refer to Plan No. 12 and Visual Analysis Photosheets]

❑ *Orientation*

The economic activities within the study area are oriented towards the spine. The land uses situated immediately on Umgeni Road displayed a significant number of commerce-based activities. The tables below indicate the land use categories along the spine and within the study area.

Table 1: Land Use Categories for Lots in Umgeni Road

Land Use Category	*Lots immediately adjacent to the spine*		*Lots on one block on either side of the Spine*		*Lots within the study area*	
	No.	*%*	*No*	*%*	*No*	*%*
Light Manufacturing	19	22%	81	23%	81	10%
Bulk	6	7%	56	16%	66.5	8%
Retail	38	43%	78	22%	84.5	10%
SUB-TOTAL - Economic	*63*	*72%*	*215*	*61%*	*232*	*28%*
Vacant	4	5%	20	6%	21	3%
Open Space	4	5%	12	3%	17	2%
Residential	1	1%	80	23%	512	61%
Other	4	5%	11	3%	27	3%
Mixed	12	14%	15	4%	27	3%
TOTAL	88	100%	353	100%	836	100%

A lot of the economic activities are motor-based, that is, motor dealerships, second hand car sales, motor services (repairs, tire and exhaust fitting, etceteras) The commercial-based activities are mostly located directly on the spine and are backed by more light industrial activities (clothing industry and metal fabrication are some examples here). There was also a scattering of small owner-occupied cafes which apparently service the workers within the area. There is a significant proportion of small, medium and micro enterprises in the area.

There is, therefore, a concentration of activity along Umgeni Road which tends to provide some sort of focus for activities and movement. The Lion Match factory, besides being a landmark, is the last of the traditional labour-intensive, space-expansive industries which historically located in the area because of its proximity to the railway. A significant trend has been the conversion of old residential dwelling units into offices and light manufacturing premises.

There are three exceptions to this orientation of economic activities: two within the study area and one on the border. There is an orientation of activities towards Windermere Road, further in the study area and away from the spine. The node at the corner of Goble and Windermere Roads is a fairly substantial one with a wide mix of uses occurring. These include offices (computer services, attorneys, etceteras) and retail (tea room, furniture, bakery, restaurants, etceteras) for example. The second is located further down Windermere Road at the intersection with Innes Road. The activities found here include a chemist, a bottle-store, a hairdresser, a restaurant, tea rooms, etceteras. This node also displays a fair mix of activities and most of these economic activities are mixed with a residential land use component. There is then a thin spread of economic activities down along Windermere Road (restaurant, tea room, furniture retail, petrol filling station, etceteras). These culminate at Windermere Shopping Centre at the intersection with Churchill Road. This is a significant land use which is situated adjacent to the study area (on the south-western border). The centre represents a large shopping node with significant office and residential components. It is about 12 storeys high and is a significant landmark as well as a major concentration of activity.

Photo No. 2: Goble Road Intersection with Windermere Road (taken from north)

Photo No. 3: South Down Windermere Road - towards the Shopping Centre

The nature of orientation of economic activity is therefore fragmented according to type of economic activity. The consumable goods and daily service activities are located away from the spine, mostly along Windermere Road.

There are a few offices scattered throughout the study area in a random manner. The only consumable goods retail outlets are oriented towards Umgeni Road and are generally the tea rooms which serve the workers of the area. The spine (Umgeni Road) seems to provide an ordering principle for the more specialised economic activities - the motor-related service activities and light manufacturing. These activities need direct access to the spine and the thresholds (i.e. commuters) along it. The offices tend to locate behind these activities - obviously relying less on direct access to a major transportation route.

The spine can therefore be said to provide a strong focus for the distribution and collection of movement which is related to these higher-order economic activities. This cannot be said to be true for consumables and more people-oriented economic activities which are located further in the study area away from the spine. For this reason Windermere Road also plays an ordering role which detracts from the spine.

The Activity Corridors Theory states that the intensive activity (mixed, economic and higher density residential) along the spine should provide a spatial ordering principle which 'protects' the lower density residential areas behind. In this area, however, the land use densities are randomly distributed throughout the area. There does not appear to be any principle by which these densities have been ordered. There is a mix of housing types in the area which does not provide a clear pattern. This does however add diversity to the fabric. See Photosheet No.4 interleaved.

The table below indicates the densities of the residential dwellings in the study area. The majority, 48%, are low density dwelling units. 36% are medium density - most of these are maisonettes and duplex developments. There is also a generous proportion of three storey walk-ups.

Photo No. 4: Panorama showing distribution of densities within study area

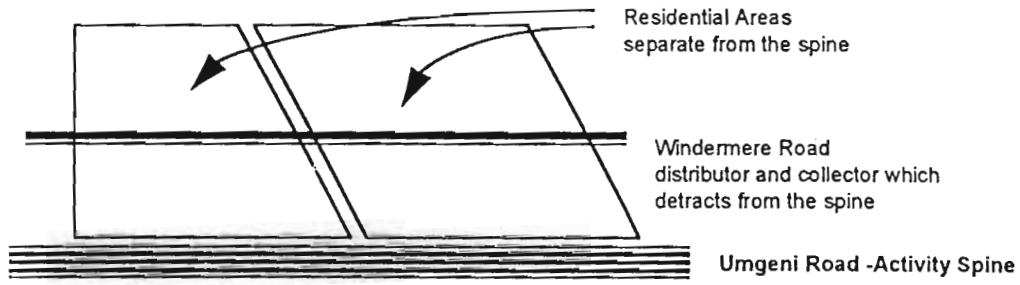
Table 2: Distribution of Lots amongst the Residential Densities

Residential Density Group	*No.*	*%*
Low Density	245	48%
Medium Density	185	36%
High Density	82	16%
TOTAL	512	100%

See Appendix 1 for details on what these categories include

The residential areas are not oriented to, or integrated with, the spine. There is very little mixed use along the spine and where the economic activities stop the residential land uses start. **Figure 7: Levels of Integration** With a Spine above indicates how the design of residential units as separate, and neither part of a spine nor each other, leads to segregated and non-integrated units. This diagram can be applied to the Umgeni Road situation:

Figure 9: Conceptual Diagram of Residential Orientation



The facilities in the area are also distributed randomly throughout the study area. Three schools are located within the study area: The Clifton Preparatory School, the Gordon Road Girls' School and the Natalia Primary School. The Durban Preparatory High School is on the south-western border of the study area. These schools are located deep within the residential area and closer to Windermere Road than the spine.

They are, however, within the corridor area. If the corridor develops into a more intensive location of activities, then it may be argued that the location of activities is within the requirements of the theory. The counter to that is that the spine will not provide the main distributor of movement as far as these facilities is concerned because of the relative importance of Windermere Road which is far more likely to

serve these facilities than Umgeni Road. Thus, spatially speaking, there is limited orientation to the spine - this being in the form of non-people oriented economic activities.

- *Clarity of Structure*

As far as clarity of structure goes, the spine acts as a natural focus only for the type of activities described above: the activities which rely on the passing traffic and which utilise the spine. The heavy commuter and industrial traffic which passes through the area from north to central Durban focuses along the spine. But the structure is not well enough defined to provide a 'natural focus' for the rest of the activities and land uses.

- *Connecting Elements and Flows*

The accessibility web created by the various connecting elements does not generate integration (see Visual Plan No. 4 and Transport Plan No. 5). There is limited accessibility between the study area in general and the spine. Umgeni Road distributes a significant proportion of the traffic to and from the residential areas but along routes which divert this residential traffic from the spine within the study area itself.

Goble Road and Argyle Road (South of the study area) are major distributors. Goble Road feeds a lot of the traffic coming in from Athlone Drive and from the North along Umgeni Road. The residential traffic then seems to use Goble Road as an access to Windermere Road and the residential areas. Residential traffic, therefore, seems to avoid the spine. Despite the Goble Road / Umgeni Road intersection being a major one, there are no retail facilities located there. See Photo No. 5 below. This is probably because of the size of the intersection and the location of the railway on the eastern side.

The nature of the roads, and their layout, do not facilitate stopping of traffic. Pedestrians are not encouraged because of the large size of the intersection and because of the lack of 'human' references. This neither allows for human scale interaction nor for opportunities to be created for retail and service activities.

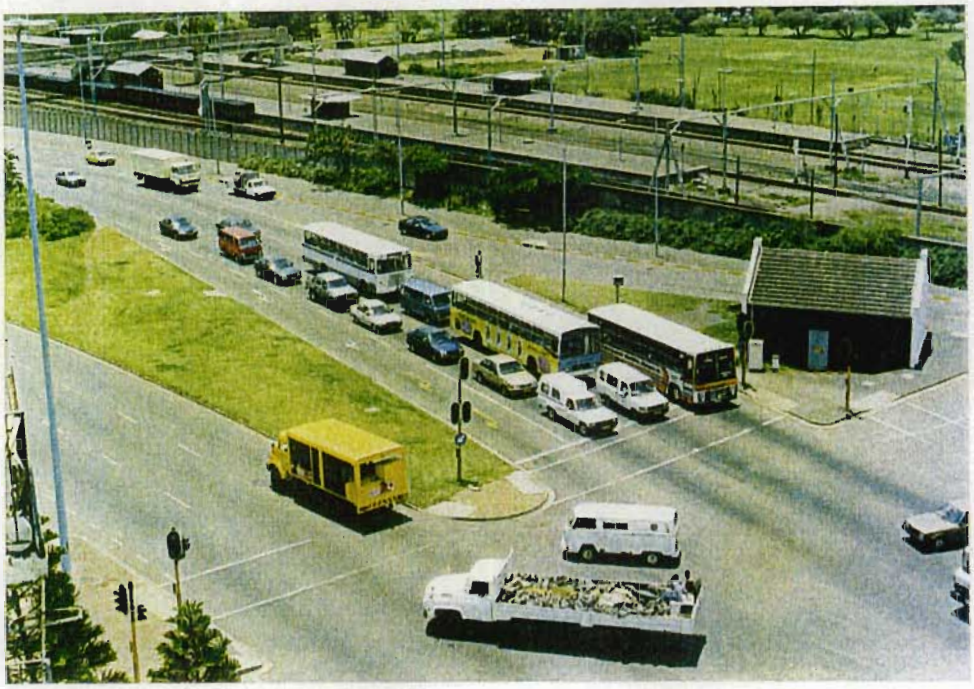


Photo No. 5 Birds eye view of the Goble Road and Umgeni Road intersection.

The intersection of Goble and Windermere, on the other hand, occurs on a human scale. The roads are narrower and there is parking available on the side of the roads. This then has provided perfect opportunities for retail and this is why there is a strong node here. The activities are people-oriented and this area is always quite busy - during both the days and evenings. The nature of activities which generate human-scale responses include: a tea room, bakery, hairdresser, travel agency, printing service, antique store, restaurants, and there is also a strong office component here.

The nature of connections between movement channels is therefore also of significance if opportunities are to be created and integration is to occur. A similar scenario evolves at the intersection of Innes Road and Windermere Road. There is a small node here as a result of the location of human-oriented retail activities. There is a chemist, tea rooms, a hair dresser, restaurants, a specialised furniture shop, etceteras. These activities also show vertical land use mixing with residential land uses being located above the economic activities.

Umgeni Road carries a heavy load of commuter vehicles, buses and heavy traffic. Refer to Plan No. 5 for figures of traffic loads within the study area. The spine is a major public transport route but pedestrian levels throughout the area remain very low. The Visual Analysis Plan No. 4 gives an idea of the relative importance of the various routes in the area.

The spine, as mentioned above, plays an important role for commuters and industrial traffic most of which seem to pass through the area without much stopping and starting within. The spine carries a significant number of vehicles per day (see Plan No. 6). Over the course of the study area, in 1992, it carried between 20 400 and 25 000 vehicles per day (11 hour period)[3]. The Goble Road intersection is an exception as the whole intersection handled 39 267 vehicles in an 11½ hour period in 1992[4]. In 1995 the traffic count at the Goble Road / Umgeni Road intersection recorded 50,007 vehicles. The table below gives the vehicular breakdown for the 'all vehicle' totals. In 1995 92% of the total was private motor vehicles.

Table 3: Vehicle Traffic Counts for Umgeni Road

Intersection - Umgeni Road	*Date*	*Hrs*	*Cars*	*Buses*	*Heavies*	*Total*
Goble Road	1995	10½	45951	2256	1800	50007
%			*92%*	*4%*	*4%*	*100%*
Churchill Road	1992	10½	17619	1821	1001	20441
%			*86%*	*9%*	*5%*	*100%*
Innes Road	1992	11½	21593	1889	1184	24666
%			*87%*	*8%*	*5%*	*100%*
Walter Gilbert / Croydon	1992	10½	21279	1838	1122	24239
%			*88%*	*7%*	*5%*	*100%*
Arbuckle / Adrain Roads	1991	11½	19128	2427	1149	22704
%			*84%*	*11%*	*5%*	*100%*

Source: Traffic counts from the Traffic Department, City of Durban

Plan No. 5 indicates that in 1992 the Windermere Road intersection with Churchill Road handled a total of 11,761 vehicles. Umgeni Road intersection with Churchill Road handled 20,441. This highlights the relative significance of Windermere Road as a distributor and collector of traffic in the area. Its importance serves to detract

[3] DMTAB Employment Survey of the Durban Metropolitan Transport Study Area 1992

[4] It needs to be explained that the Athlone Drive feeds a significant proportion of traffic from the NMR Avenue and Durban North to Umgeni Road (moving away from the study area to the north) and Goble Road

from the spine as Windermere is more convenient for residents. It also has economic activities located along it and intersects (to the south of the study area) with Argyle Road.

Photo No. 6: View North up Windermere Road (Mynah departing)

Windermere Road is also an important route for public transportation. According to the 1995 traffic counts[5], the spine at Goble Road carried just over 2200 buses in a 10½ hour period. This is a significant number of bus trips into and out of the study area (and the city in general). It is of metropolitan more than local significance as the majority of passengers travel through the area. There is a small amount of off-loading and on-loading of passengers within the study area. Bus and taxi stops do not seem to be restricted to any specific stopping points. Despite there being designated stops the taxis and buses will stop at any point required by the passengers. Windermere Road also plays a role in public transportation but on a much lower level. The smaller Mynah buses operate along this route and serve to integrate the study area with Central Durban. This service is mostly utilised by youngsters, elderly people and domestic workers.

[5] Traffic Department, Durban City Council

Photo No. 7: Churchill Road as viewed from Umgeni Road

There are inadequate interceptor routes with the spine. Innes Road, Adrain Road and Churchill Road are the only ones which are used to any significant extent. The design of the other roads does not allow them to play an important role as interceptor routes. Most of them are narrow lanes which do not follow through to the residential area. There seems to have been a deliberate attempt to prevent 'interruption' to the residential areas by economic activities. Livingstone Road does not cross Umgeni Road but only feeds into the north-bound traffic land. The centre of the spine is divided by a narrow island. Not being a four-way intersection prevents it from becoming a significant interceptor route. Instead it is only a feeder into the spine.

There is not much interaction with the railway as a movement channel. The station is just to the north of the study area (see Plan No. 5) but does not transport significant numbers of people. The table below indicates the number of people entering the station (and therefore leaving the study area) and leaving the station (entering the study area) in a DMTAB (1992) study:

Table 4: Number of People Entering / Leaving the Umgeni Road Station

Time Frame	Entering	Leaving
Morning peak hour	113	1263
Evening peak hour	958	95
Total between 6:00 - 18:00	2183	2905

The bulk of the movement therefore appears to be people entering the study area during the morning and leaving in the evening - that is, they are most likely to be workers employed in the area. Approximately half the daily movement occurs between the peak hours and so would appear to be shoppers or residents in the study area or in close proximity. Rail therefore appears to be used more by the workers of the area than by residents. This is primarily attributed to the socio-economic characteristics of the resident population (see 5.3.4.3 Social Integration below).

The next station along the line is the Durban Station which is a very significant one and represents a major node. There is no reinforcement, therefore, between the road and rail in the study area. The only link is provided by the Lion match factory which uses the rail for transportation of its raw materials (timber) and end products. This reinforcement between road and rail will be more significant at a metropolitan scale where the rail reinforces the Activity Corridor as a whole.

- *Pedestrian Movement*

Pedestrian movement along the spine, and in the study area in general, is minimal. It is restricted to workers within the residential areas and along the spine and a few shoppers. Domestic servants in the residential areas have to walk to Windermere Road, Umgeni Road or the station as they generally rely on public transport. In the mornings between 7:00 and 9:00 there is a flow of pedestrians (domestic workers) into the residential area from the spine. This flow is reversed in the afternoons.

Elderly people are the main pedestrians seen walking along the streets within the residential area during the course of the day, mostly along Windermere and Innes Roads. Most of the children from the schools are collected by motor vehicles and do not interact with the spine and related activities at all. Pedestrian movement between the residential areas and the spine is practically non-existent.

The socio-economic nature of the area is once again a major factor here. Being a higher-income area there are high levels of vehicle ownership and the majority of the population are of working age. But even if the nature of the socio-economic composition did favour pedestrian activity - the design of the roads does not facilitate pedestrian movement. The pavements within the residential area are wide. There are benches for sitting on and many of the streets are treed (see Photo No. 8 below of Venice Road) and pleasant for any possible pedestrians. Below Windermere Road, however, most of the pavements become narrow and 'unfriendly'. Along the spine the pavements are narrow, unkempt and not designed with the pedestrian in mind (if 'designed' at all!).

Photo No. 8: Venice Road as an example of the attractive streets within the Umgeni Road residential area.

There are no significant linkages with the spine. As mentioned before, the lanes are very narrow and would therefore be considered unsafe to pedestrians alone. Most of the lanes feeding off Umgeni Road do not link up with the inner residential area. Also, the residential area is on a higher level than the spine and so an uphill walk back to the residential areas is necessitated. Goble Road and Churchill Roads are both very steep and are not inviting as pedestrian access ways.

The nature of facilities along the spine is also an influencing factor here as there are no significant human-scale activities located along the spine. As described above, most of the retail and service activities occur along Windermere Road, further within the residential area. The proximity of the Windermere Shopping Centre is also a major influence. The majority of residents, it is expected, would do their shopping at this centre. There is a wide range of retail facilities and services available at the centre including a major retail store, Checkers.

❑ *Hierarchy*

A clear hierarchy of connecting elements is deemed a necessary requisite for integration. The spine has to be the dominant movement channel. Umgeni Road is certainly seen as a major arterial and a significant movement channel but this is not unqualified. As far as metropolitan scale movement and most types of economic activity (explained above) are concerned, Umgeni Road is the dominant transport route. Windermere Road, however, also plays an important role in distributing and collecting movement. In 1992, Windermere Road handled between 11 700 and 14 100 vehicles (DMTAB, 1992) along its length in the study area (see Plan No. 5). At the northernmost end of Windermere Road it turns left into Trematon Drive. This is also a major collector / distributor road which serves Morningside and the suburbs west of the study area.

It can be argued that for residents in the study area, Windermere Road is more important and used more often than Umgeni Road. This is highlighted by the nature of these roads which is important given the high levels of motor car ownership. Umgeni Road is heavily trafficked and has few interceptor roads which contribute to an increase in traffic speed and a concomitant decrease in safety. Windermere on the other hand is used mostly by cars and Mynah Buses which link the study area with the Berea, the beach-front and Durban City Centre. These pose minimal threat to other vehicles. Windermere Road is a lot less 'hectic' than Umgeni Road and residents do not have to anticipate run-ins with public transport vehicles.

The layout of the access roads up to Windermere Road (Adrain, Livingstone, Innes and Goble) are in a reasonably enabling very-modified grid layout pattern (refer to the Land Use Plan No. 3). However this is broken above Windermere Road and a completely different alignment of roads occurs. Innes Road is the only one which

travels straight through the study area and continues. Goble Road dissipates at the western end of the study area. This road layout does not facilitate any interaction or association with the spine. Also the number of cut-off and narrow lanes (for example Croydon Road, Rassmere Road, Kittymere Avenue, Dulwich Road and Keswick Road) do not encourage opportunities to develop. They appear to be hidden within the system.

- *Accessibility*

These factors are linked to accessibility. The means of accessibility in the study area are high, that is, high vehicle ownership but there is nothing to be accessible to. The type of activities which would lead to integration between the spine and the residents do not occur to a sufficient extent. This is part of an important link between functional and spatial integration.

The schools and religious facilities are located within the residential area and are accessible to the local population. Access to public transport is not a major concern for this socio-economic grouping (higher-income and private vehicle ownership levels). Because of the lack of orientation, hierarchy and clarity of structure as mentioned above the spine does not represent a major 'vehicle' for accessibility as should be the case in an Activity Corridor.

- *Density*

Density as an element of integration requires that the higher density land uses are located along or adjacent to the spine. The residential land uses in the study area do not exhibit any spatial pattern of densities. The overall density of the study area is perhaps a little higher than the average South African city - but a little low next to compact city and Activity Corridor standards. The study area has a density of about 42 people per hectare if worked out according to the population figures.

The study area has a reasonable (i.e. higher) average density if one looks at the other generic areas of the Activity Corridor indicated in the Table below[6]:

[6] Seneque Maughan-Brown SWK, 1995a

Table 5: Population Densities in the R102 Activity Corridor by Generic Area

Area	*Density ppl/ha*
Greater Amanzimtoti	12
Isipingo	28
Umbilo	19
Warwick	58
Greenwood Park/Red Hill	16
Mount Moriah	45
Phoenix South	24
Tongaat	23
Average for Corridor	19

The study area density does not generate sufficient threshold in terms of that required by the Activity Corridor Concept - a gross density of 50 - 100ppl/ha is called for. This coupled with the tendency for the threshold to dissipate could be one of the many factors influencing the nature of activities along the corridor. Higher income people are more mobile and therefore tend to do their shopping at shopping centres. Windermere Shopping Centre is the only centre located reasonably close to the spine. Musgrave Shopping Centre is a popular destination for people (particularly those in Morningside, Windermere and the Berea)[7].

The spatial distribution of residential densities is haphazard with no logical ordering of the higher densities (see Photo No. 4).

[7] MTRP 1994 Project Work: Residential Analysis

Table 2 above indicates the residential density categories. There are clusters of high density flats distributed throughout the study area. There are also quite a few maisonettes. The single dwelling units range from quite modest sized units in the east to the larger, more expensive units in the west. The dwelling units to the west of Windermere Road are larger and in better condition than those on the east (see Visual Analysis Photographs). The higher income residents have obviously taken advantage of the better views (sea views from the elevated position) and quieter roads on the western side.

Photo No. 9:

Photo No. 10:

❑ *Permanent Physical Objects and Quality of Social Space*

The building stock of the economic land uses varies in extent from old, badly-in-need-of-repair buildings to modern showrooms and offices. The area closest to the spine contains the majority of the old building stock. Many buildings have been renovated, mostly within the middle band. This is a positive feature as far as economic activity is concerned as businesses can afford to invest in housing stock and upgrade the area. Photo No. 11 below illustrates a number of old walk-ups which are being renovated for business use. What this means for integration cannot be identified at this stage but if stock like that depicted in the photo could be developed for mixed uses it would set an initiative. This could perhaps go some way towards encouraging mixing of activities. Old stock can also be converted into a wide range of building types and so a variety of uses could ensue. In reality this would depend on a wide range of factors.

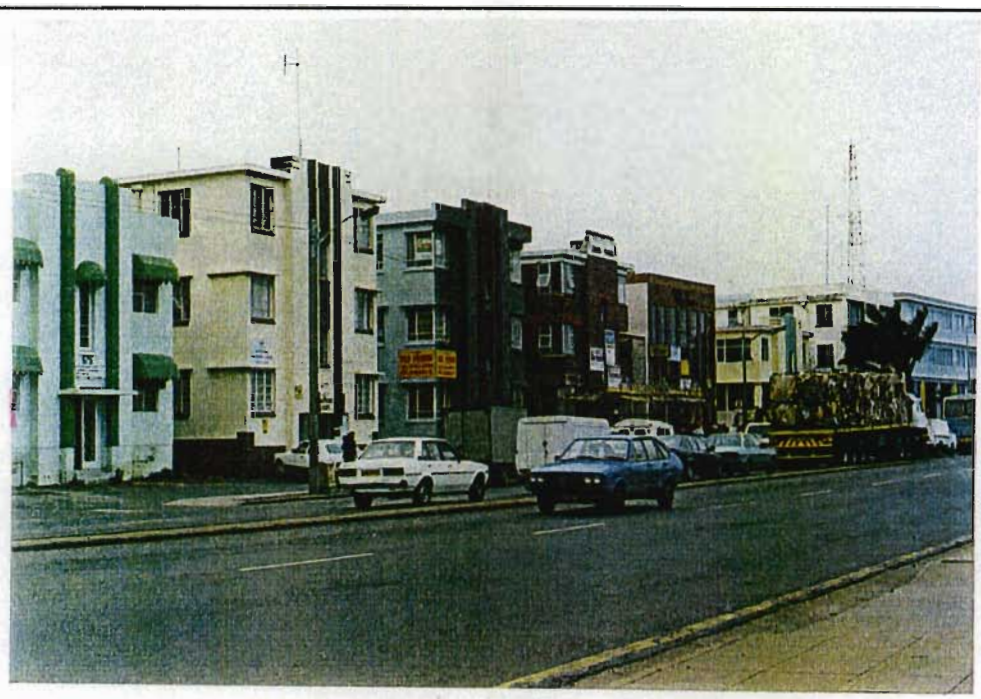


Photo No. 11: Residential Flats along Umgeni Road presently being renovated.

The overall condition of the area is generally good. The public realm is in good condition through most of the area but there are not any significant public spaces or linkages between what parks and spaces do exist.

❑ *Grain and Land Use Mix*

The study area does not exhibit a fine grain of land uses. Rather, the land uses occur in clusters throughout the area (see Photo No. 10 above). This does not facilitate integration which calls for fine-grained environments which exhibit a wide dispersion of activities - shopping, work, education, residence, recreation, etceteras should all occur as a thorough mix and in close proximity to each other. In Umgeni Road, most of the shopping occurs in three main nodes and even the different types of dwelling units cluster into groups of similar form. Although they are distributed throughout the residential area, they do cluster - see Plan No. 3.

5.3.4.2 Functional Integration

[Refer to Plan No. 13]

❑ *Land Use Mix*

The land use mix is not a very complex and diverse one at all. The activities located along the spine do not attract people on a pedestrian or local level. Rather, the motor-related commerce and service uses serve the passers by from the metropolitan region. The light industrial and office component do not generate levels of interaction to any significant extent. Residential interaction with the land uses located along the spine will be reduced to specific recreational outings, employment opportunities (which is not expected to be significant) and random economic transactions. For example, the purchase of a car, exhaust or tyres.

Table 1 above indicates the distribution of lots amongst different land uses for immediately adjacent to the spine, a block on either side of the spine as well as for the entire study area.

Only 3% of the lots are mixed economic and residential. This is definitely not in the interests of creating varied environments (there is just as much land-use mixing within the residential areas as there is along the spine). Residential is by far the most significant land use making up 61% of the whole. The residential land-uses range at random between Low, Medium and High Density Residential. The high density residential is mostly in the form of blocks of flats, on average 5-6 storeys high. The residences are fairly large and most of the older houses have been renovated. The economic activities adjacent to the spine have taken over single dwelling units and

converted them into offices. The residential component has been 'pushed' further away from the spine. Economic uses constitute 28% of the whole.

The two nodes within the residential area, along Windermere Road (see Land Use Plan No. 3 and Visual Analysis Plan No. 4), exhibit a rich mix of people-oriented land uses. These activities rely on the local resident population for their threshold and their very nature generates interaction with the study area population. The node on the corner of Innes and Windermere Roads shows what vertical land use mixing should be: retail and service activities on the ground floor with residential units above. See the photo below.

Photo No. 12: Mixed Use: Residential Flats Above Chemist and Tea-Room

The Sutton Road park offers a children's playground, an open area with benches as well as an enclosed in swimming pool. There are five churches in the area. The Anglican Church on the corner of Venice Road and Innes Road is a landmark and is the largest in the study area. The hall also serves as a community hall for various activities; for example, ballet dancing.

There are a number of facilities which could draw people together within the study area if they were better located. Sutton Park draws local residents, particularly for the swimming pool in the hot summer. An example of integration occurs between

facilities: the Durban Preparatory High School uses the Gordon Road Girls' School swimming pool for lessons and galas.

Photo No. 13: Sutton Park viewed from Umgeni Road

For integration to occur between the land use components there would have to be a far higher degree of diversity and mixing. At present the economic uses are coarse-grained, occurring in clumps of 'like' activities. The residential uses are just that - residential. Apart from the schools, churches, police station and the nodes described above, the residential land use areas have minimal mixing of activities. There are a few offices dotted around the study area, mostly between Windermere Road and Umgeni Road. There is an example of mixed use in Venice Road - a chiropractor who works from home. With the exception of the Anglican church on the corner of Venice and Innes Roads, the churches are tucked away within the residential blocks and would therefore not serve any integrative role. The restaurants along Windermere Road would serve to integrate the area with surrounding residential areas but this does not further integration with the spine.

The presence of the sporting facilities on the eastern side of the spine means that some of the residents would use the spine as an access route to the activities but this does not represent any significant element of integration.

❑ *Public Transportation*

As far as public transportation is concerned, there is a variety of modes available along the spine but these are not likely to be of much use to the local residents. The railway plays a small role in delivering workers every day. Buses and taxis tend to serve the metropolitan population and people employed in the area. There is a Mynah Bus service which travels along Windermere Road and links the local population with the rest of the Berea, Durban central and the beach front. These buses are smaller, frequent and are more reliable than the private bus lines which run along the spine. The Mynah service is used by residents - mostly by teenagers, domestic servants, elderly people and people who work in Durban central (to save on parking expenses and congestion).

5.3.4.3 Social Integration

The demographic profile reflects a high percentage, 69%, in the working age group (between 18 and 64 years) and a relatively high number of older persons (65 - 99 years), 17%. There is a clustering of private and public old age homes in the north-west of the study area. Only 14% of the study area group are of school-going age and below. The schools' thresholds rely on a wider area. This is not in any way facilitated by the spine. The population is predominantly white and falls within the higher income group. There are certain assumptions which can be made with this population mix. The people will be relatively mobile with a large proportion owning cars. Higher income people, particularly from the white race group, tend to shop at shopping centres outside their residential areas.

Household income figures were only available for 37% of the total - this usually occurs with higher-income groups who do not wish to specify earnings. This is a higher-income area with relatively high value properties and high rates. The implications are varied. Higher incomes tend to be more mobile and therefore tend to rely less on local stores and economic facilities than lower income people.

The safety and security of an area is believed to influence the levels of interaction. This would seem to play some part in the area as there is not a lot of pedestrian activity along the spine which would provide surveillance. The residential areas

would be empty at night as there is no mixing of uses to provide activity throughout the evenings. This is also true for activities along the spine which is practically deserted over the weekend (see Photo No. 14 below). The Goble Road and Windermere Road intersection is a small exception here as they are vibrant throughout the weekend.

Photo No. 14 The spine on a Saturday afternoon.

The social profile of the area does not lead to any significant 'variety of demand'. The urban form does not in any way play a social role for the activities and users of these activities. People travel primarily by car. Residents do not seem to interact with the spine. Not only does the nature of activities affect who uses the spine, but so does the nature of the residents affect what occurs along the spine. There is strong correlation between the two. In this case the spine and the related thresholds provide more of an incentive for activities than the residential component of the study area.

5.3.5 Conclusions - Umgeni Road

On the whole, the Umgeni Road study area does not exhibit significant degrees of integration. Spatially there is some potential to achieve the structural goals which

achieve integration. The orientation of economic activities is clear, there is some clarity of structure, accessibility to public transport and the quality of social space is not bad. The accessibility web is also a suitable beginning. These, however, do not go far enough. The elements of functional and social integration do not exist with the exception of public transport facilities. Land uses are only compatible because they are separated to such an extent - the uses which are not separated are compatible with the residential uses.

This area gives a good idea of how the South African city structure has been designed and has evolved. The emphasis on separation of land uses and growth of separate areas for different races, as well as planning by numbers[8], has prevented the creation of positive environments. Admittedly, the area is pretty to look at but it does not work for many of its users. The elderly, the young, the domestic workers, for example - they all have to travel far for any goods and services. Their needs have not been planned for. In Umgeni Road, the population travel by motor vehicle to the various activities. This exacerbates the planning notion that the streets' main function is vehicle-movement. This prevents the area from developing any character, from people using the environment and from the streets playing a social role. The area is dead at night and therefore not considered safe. The activities along the spine do not encourage 'people' activity and this is because of zoning controls.

[8] Facilities are provided according to standards set which specify how many facilities to provide per so many dwelling units. These are then applied to develoments as they occur - often without much consideration to context.

5.4 Clairwood

5.4.1 Study Area

Clairwood lies about 8km to the south of Durban CBD. Plan No. 6 illustrates the study area. It is bounded by the railway in the west and the Umhlatuzane Canal in the north. The Clairwood Boys' School and Blamey Road / Jacobs Road form the southern boundary. The eastern boundary is provided by Flower Road and Ganesh Road. This forms an area of approximately 100 hectares. The study area encompasses the R102 / South Coast Road and a large portion of the Clairwood residential settlement. When the study refers to the 'residential area' it is referring to the portion of the study area east of the Southern Freeway.

The Southern Freeway disjoints a number of roads from the residential area. Blamey Road intersects with the South Coast Road and then, once under the freeway, becomes Jacobs Road. There is a Jacobs Road intersection with South Coast Road but this is cut off at the freeway. A similar situation applies to Sirdar Road which turns into Archary Road once under the freeway.

5.4.2 Introduction

The area was settled in the late 1800's by Indian workers. Since then it has developed into an area with a strong sense of community due to its particular history of battles with the Durban City Council contending industrial zoning.

The South Coast Road was a major influence on the growth of Clairwood as it provided a trade route for the first Indian market gardeners who settled along it. The road is referred to as an activity spine in that a large mixture of land uses have agglomerated along it over time, to quote Seneque Maughan-Brown SWK (1995a:57)

> *"Clairwood ... represents one of the better examples of how diverse, complex and alive an activity node should be. The area has the most intensive and fine-grained mix of various land uses: light and heavy industry, commercial, retail, service and residential. In terms of the general urban performance criteria and the preconditions put forward by those advocating Activity Corridors and nodes this area probably ranks the highest".*

5.4.3 Sub-Regional Location

The South Coast Road is an important link between the airport and industry to the south as well as the harbour and city centre to the north. It therefore carries a large amount of commercial and industrial traffic. It is also a thoroughfare for commuters from the south (Chatsworth and Umlazi) travelling northwards. The R102 links with Edwin Swales VC Drive just to the north of the study area. Edwin Swales VC Drive provides a link with the arterial which links the area to the west and to the N2 north-south freeway, as well as to the Bluff to the east and the related industrial activities.

The region is an historical and important location for industrial activities. The larger Clairwood / Jacobs / Mobeni area contains the Clairwood Hospital and the Clairwood Racecourse.

5.4.4 Analysis of Integration

To be read in conjunction with Plans No. 6, 7 and 8 located after 5.4.4

5.4.4.1 Spatial Integration

[Refer to Plan No.14 and Visual Analysis Photosheets]

Photo No. 15: The South Coast Road (looking north from Jacobs Road)

❑ *Orientation*

The orientation of the intensive land use activities occurs around the spine. Economic activities are concentrated along the spine within the study area and represent very intensive and varied activities within a relatively small area. This concentration creates a spatial ordering principle to a certain extent as activity is drawn towards this concentration - but it is by no means sufficient. There is a dissipation of this concentration into the study area as a whole. There is a wide dispersion of economic activities throughout the study area with two main concentrations along Jacobs Road and along Archary Road. These activities are not as intensive as those found along the spine.

Archary Road represents a concentration of light industrial and manufacturing uses - these are also mainly transport-related. The lots between Archary Road and Edwin

Swales VC Drive are used for large-scale distribution depots (for example UNITRANS) and wholesalers (for example MAKRO). These activities are oriented more towards Edwin Swales VC Drive than the spine. Both Chalmers and Ganesh Roads provide access onto Edwin Swales (which intersects with the spine just north of the study area).

The other concentration of economic activity occurs along Jacobs Road (east of the Southern Freeway) and contains a strong transport / vehicle-related retail and service component. This is a fairly busy road as it intersects with the Southern Freeway and on the western side connects with Blamey Road which provides access to the residential suburb of Montclair.

The neighbourhood as a whole would seem to be oriented to a degree towards the spine. This is apparent if one looks at the orientation of most of the main facilities which seem to be extroverted to the spine. The main schools (two primary schools and a high school) are located on the spine. These include the Durban South Girls' Primary School, the Clairwood Boys' Primary School and the Clairwood High School in the south of the study area. The residents were responsible for building many of the communal facilities and institutions. The Clairwood Boys School was built in 1903 by the community (Seneque Maughan-Brown SWK, 1995c). The majority of the school children appear to walk between school and home. Only the smaller madrasa (state-funded school) is located within the residential area, in Shabally Road. Even then it is relatively close to the spine. The church is also located along the spine: the St. Louis Catholic Church is a national monument and is located in Jacobs Road next to the Girls' School.

The temples are located within the residential areas. There is the Clairwood Tamil Institute in Sir Kurma Reddi Road which represents not only a religious node but also a residential node. The Shree Shiva Subrahmanya Alayam is a temple compound in Sirdar Road. This is the country's only complete (urban) true Hindu Temple Compound and it contains three temple buildings of three different periods (Seneque Maughan-Brown SWK, 1995c). There is smaller temple on the corner of Sirdar and Shabally Roads. There is also a very small temple in the garden of one of the dwelling units (in Richborough Road). Whether this is private or for a particular group of people is not known. The situation of the main temple in Sirdar Road would

perhaps contribute to a degree of integration between the residents and people from the metropolitan area.

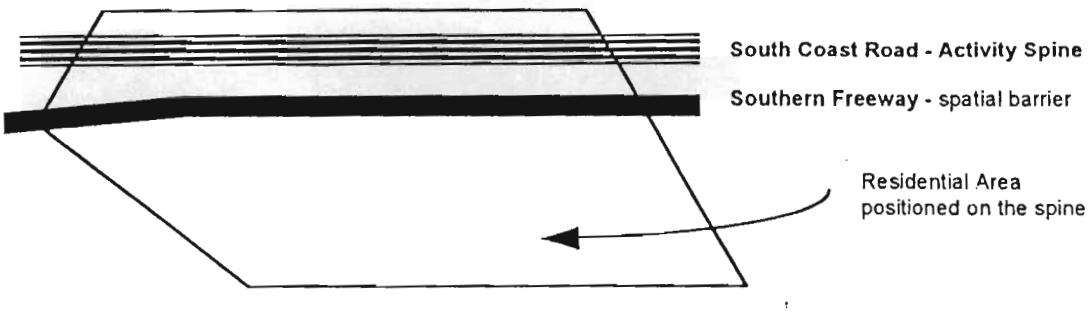
The argument that the distribution of economic activities throughout the area would lead to further integration between residents and the activities of the corridor could be put forward. This would perhaps be the case if the activities were 'people-oriented' as on the spine. Refer to Table 6 below indicating land uses within the residential area. Some of the activities within the spine are small retail shops which would serve the local population, but the majority are transport / motor-related activities. Thus the spatial distribution of these economic activities on the whole does not further integration within the corridor.

Table 6: Distribution of Lots within the Residential Area of Clairwood

Land Use Category	*No. of Lots*	*%*
Light Manufacturing	50.5	12%
Bulk	26.5	6%
Retail	42.0	10%
SUB-TOTAL - Economic	*118.0*	*28%*
Vacant	86.0	20%
Open Space	3.0	1%
Other	6.0	1%
Residential - low density	150.0	35%
Residential - medium density	9.0	2%
Mixed	56.0	13%
TOTAL	429.0	100%

The residential activities are spatially integrated with the spine in terms of there being a strong residential component along the spine itself. This is a positive spatial feature in terms of the residential area being a part of the activity corridor and not juxtaposed separately to the spine (See above). Initially this would have played an important role in the nature of the activities themselves as well as encouraging integration with Clairwood as a whole because of the diversity created and the safer environments resulting from the increased activity.

Figure 10: Conceptual Diagram of Residential Orientation



The spatial integration of the main 'residential area' with the spine is however blocked by the Southern Freeway. It represents a major barrier from which there is almost no reprieve. The Southern Freeway spatially separates the heart of Clairwood from the South Coast Road. There are only three connections between the spine and the 'residential area' of Clairwood. Sirdar Road intersection distributes a lot of traffic into the area and to the activities along Archary Road. Blamey Road, which becomes Jacobs Road under the freeway, is also a busy intersection which feeds into the area. There is a pedestrian walkway which extends Pine Road under the freeway. This provides an essential link between the two areas. This can be likened to a lifeline. The residents and people within the Clairwood area (workers, travellers from Transkei, etceteras) use this underpass to access the shops, services and activities along the South Coast Road. There are informal traders located within the walkway making use of the passing pedestrian traffic.

- *Clarity of Structure*

The clarity of structure is interrupted by the southern freeway as well as being dissipated by the mixing of activities within the residential area. The spine provides a structure for orientation of intensive retail and service activities. The intensity of the focus for all activities is not so clear because of the wide spread of activities throughout the area. It would also be because of the nature of the activities surrounding the study area. The Clairwood / Jacobs / Mobeni area as a whole is a natural focus for industrial and 'non-people oriented' economic activities. The harbour is located to the north-east. So the degree of clarity of the spine as a natural focus will be influenced by the wider region. The regional setting could also account for the dispersion of activities within the residential area.

❑ *Connecting Elements*

The accessibility web created by the connecting elements does not further integration as a whole, although the importance of the actual connecting routes themselves is exaggerated because of the concentration of movements along them.

The Southern Freeway provides an access link to and from the metropolitan region as a whole for residents, shoppers and workers alike. It is not, however, as important as the spine to the residents in the area. The spine provides goods and services to the local population as well as access to facilities and public transportation. South Coast Road represents a major transport route for motor cars, buses and heavy vehicles. Because it is only two lanes wide in the study area, a high concentration of traffic occurs. There are pedestrian crossings at the intersections and these are packed with pedestrians. A lot of traffic feeds off the spine down along Bacus Road, either to turn back into South Coast Road or to find parking. The Trent Road intersection is also a busy one.

Photo No. 16: A view of the Spine Depicting Activities

Plan No. 9 details the number of vehicles carried by the spine. The latest traffic count figures obtained from Durban City Traffic Department (1995), taken at the Sirdar Road intersection indicate that the intersection handled 20,033 vehicles during an 11 hour day. This figure includes 1,797 buses and 2,619 heavy vehicles.

South Coast Road is an important route for public transportation. A high number of combi-taxis were noted along the spine and there are two taxi ranks in the study area. The taxi operators are not regulated however, and stop wherever necessary or deemed fit. Photo No. 17 shows the Jacobs Road taxi rank.

Photo No. 17 The Taxi Rank in Jacobs Road

Stop-start movement is enabled by the precense of a number of intersections within the study area. There is space to pull over on the side of the road - this space is generally congested during the day (apparent in Photo No.16 above). Stopping is prohibited during peak traffic hours. This flexibility improves the functionality of the route. Railings / barriers in the median (middle of the road) restrict pedestrian crossings to intersections. This contributes to safety as the road would otherwise be impossible to cross.

The spine as a movement channel is reinforced by the railway line. The extent to which this influences the local residents is not considered significant. The table below illustrates:

Table 7: Number of People Entering / Leaving the Clairwood Station

Time Frame	*Entering*	*Leaving*
Morning peak hour	344	2362
Evening peak hour	2430	374
Total between 6:00 - 18:00	5492	5439

With the majority of rail passengers entering Clairwood (leaving the station) in the morning and leaving (entering the station) in the evening, it would appear that these passengers are workers or shoppers who travel from areas outside the study area. A small number of people leave Clairwood in the morning although this represents a link with rail as a transport route, however small.

The Pine Road pedestrian walkway is linked to the Jacobs Road / South Coast Road intersection. This makes the walkway more visible to the users of the spine than would be the case if it were on Houghton Road for example. Jacobs Road is wider and it is closer to the schools and church.

Photo No. 18: The Pedestrian Walkway under the Southern Freeway

❑ *Pedestrian Routes / Movements*

The walkway, depicted above, provides a necessary link to the area which is well used by residents and non-residents. The main pedestrian route is along Pine Road

which provides a spatial connection to the spine and which feeds the entire residential area. There is not a lot of motor vehicle traffic within the residential area - most of the movement seems to occur on foot. The design of the streets themselves would not normally encourage pedestrian activity. Very few have adequate pavements - only Pine, Houghton and Sirdar Roads have proper pavements. The pavements that do exist are generally overgrown and in very poor condition. There is not much traffic within the residential area itself and this would make it safer for pedestrians. A problem is the daily traffic (not a lot), of which a large portion is heavy vehicles. This does not improve safety levels for pedestrians. The heavy vehicles often make full use of the road and the pavements when turning a corner. The pavements also provide additional parking space for business activities. The high levels of interactions and activity in the area would contribute to it being a safer place because of increased surveillance. This would encourage pedestrian activity (see 5.4.4.3 .Social Integration below).

❑ *Hierarchy*

The hierarchy of the connecting elements influences the spatial organisation of activities. See Plans No. 7 and No. 9. The spine is definitely the dominant route in terms of function - it carries by far the majority of the traffic in the area and provides a wide range of goods, services and facilities. For the local residents, the southern freeway has significance only as an access route to and from the centre and south of Durban.

Because of the link with Sirdar Road, and therefore the spine, and its location parallel to Edwin Swales VC Drive, Archary Road is a fairly important road as far as the organisation of activities is concerned. The same applies for Jacobs Road (east) which is also a link with the spine and contains a concentration of activity.

Within the residential area itself there is no clear hierarchy. Sirdar, Houghton and Pine Roads are all wider than the other roads in the area but this does not appear to have any influence on the hierarchy in terms of movement. In terms of function, Sirdar Road and Pine Road appear to attract more activity than the others but this does not seem to be because of any spatial ordering. The roads throughout the area are busy. Richborough / Horsham Road, for example, is a narrow road which links the north of the area to the south; it is not designed to carry anything other than

residential traffic yet it was observed to have a higher heavy vehicle component than should be the case in a residential area.

The grid hierarchy may be argued to provide a spatial ordering principle, but in this case there is no clear hierarchy of the streets and the streets do not link with the spine. These are the two main shortfalls of the spatial organisation of the roads. Certainly, a range of alternatives have been provided and a range of opportunities have been taken up. One finds many mixed uses within the area which adds to its diversity. Spatially, the hierarchy focuses attention onto the spine. It can be said, however, that the layout pattern and hierarchy of the movement channels does not promote integration between the residents and the spine.

- *Accessibility*

Accessibility is related to levels of integration and is influenced by hierarchy. Spatial accessibility has been covered above - the effect of the Southern Freeway and the small number of connector routes. The strong relationship between functional and spatial integration is indicated with accessibility. Despite the spatial restrictions on accessibility, there is still a strong integrative link with the residents - this is believed to be because of the nature of goods, services and activities available on the spine. Functional integration will be discussed below. The issue of accessibility also highlights the importance of the pedestrian channels of movement as significant spatial integrators.

- *Density*

The issue of density as a spatial ordering principle applies in a very limited context in this study area. The density is approximately 31 people per hectare. The majority of the residential units are single dwelling units. The residential land uses along the spine itself are of higher density two- to four-storey blocks of flats. Within the residential area the 'higher' densities consist of a few simplex developments and one two-storey block of flats. The density is further lowered by the high number of vacant lots in the area. A significant proportion of lots are not developed at all and are just weedy patches of no use. The squatter settlements provide small agglomerations of higher densities, but these do not influence density patterns at all.

The residential units along the spine are higher density units as they are two- to four-storey apartments above the economic land uses. These, also, do not have any spatial influence on integration save the interactions between the residents and the spinal activities themselves.

- *Permanent Physical Objects and the Quality of Social Space*

The nature of interfaces between the permanent physical objects also does not seem to play an important role within this study area. The quality of social space cannot be considered to be positive and to benefit integration in any way. The whole of the area is very run down. A lot of the buildings are derelict and there is a lot of refuse and waste lying around. The city runs a refuse removal service, but this does not include waste produced by commercial and industrial uses. The dwelling units range widely in condition from practically new to completely run down. There are not many new houses. The photographs in the Visual Analysis illustrate housing stock. The public spaces are littered and unkempt. The nature of the interfaces does not facilitate any interaction with residents and users in general. The Photo below illustrates.

Photo No. 19: Illustration of littered, uncleaned streets.

- *Grain and Land Use Mix*

The argument that positive environments enable activities to respond according to the specificities of location is put forward. This leads to a mix of land uses and creates diversity. There is a strong mix of land uses and this can be argued to create spatial integration between the residential and economic land uses. The dispersal of different land uses within the area does not represent a particularly fine grain. The mixing of uses does not appear to be widely dispersed although the degree of mixing does lend some 'texture' to the area. Activities still cluster to some degree - this is apparent in Land Use Plan No. 7.

5.4.4.2 Functional Integration

[Refer to Plan No.15]

If integration is promoted by diversity and a mixing of land use activities, then it can be argued that the study area is functionally well integrated. There is a wide variety of land uses both along the spine and within the residential area. The Land Use Plan No. 7 indicates the presence of retail / commercial based activities, wholesale / distribution activities, light industrial / manufacturing and mixed uses. The land use mixing that occurs with residential land uses is quite varied. There are motor-related activities - be it in the form of panel beaters, repairs or spare parts. There are a lot of shops and general retail outlets which are mixed with residential usage. An interesting finding of the Seneque Smit Maughan-Brown study (1994) was that only 10% of respondents indicated that they conducted business from their sites. Just under 50% reported the presence of businesses next door. The businesses identified in the study support this study's findings as they were generally related to the motor trade or retail / commercial activity. The activities identified in each category in the Seneque Smit Maughan-Brown study's findings are summarised below:

Table 8: Business Types in Clairwood Residential Area 1993

Business Type	*%*
Motor Trade	43 %
Commerce	24 %
Other	13 %
Building Trade	11 %
Clothing	6 %
Industry	4 %
Total:	100 %

The table below gives a breakdown of the land uses of the lots within the study area as a whole, land uses next to the spine and a block on either side of the spine as per the 1995 Land Use Plan No.7.

Table 9: Land Use Categories for Lots in Clairwood

Land Use Category	*Lots immediately adjacent to the spine*		*Lots on one block on either side of the Spine*		*Lots within the study area*	
	No.	*%*	*No*	*%*	*No*	*%*
Light Manufacturing	5.5	8%	21.0	18%	89.5	16%
Bulk	0.0	0%	0.0	0%	27.5	5%
Retail	33.5	46%	51.5	44%	93.5	16%
SUB-TOTAL - Economic	*39*	*54%*	*72.5*	*62*	*210.5*	*37%*
Vacant	3.0	4%	3.0	3%	92.0	16%
Open Space	0.0	0%	1.0	1%	4.0	1%
Residential	0.0	0%	1.0	1%	160.0	28%
Other	4.0	5%	9.0	8%	19.0	3%
Mixed	27.0	37%	31.0	26%	87.0	15%
TOTAL	73.0	100%	117.5	100%	572.5	100%

The following photographs give some idea of the mixed uses in the area:

Photo No. 20: Mixed Use Activities along the Spine

Photo No. 21:

Photo No. 22:

❑ *Diversity*

The spine itself, therefore, represents a rich, diverse mix of formal and informal retail activities. This tends to occur in the form of horizontal mixing with the informal trader in the front of the site and on the pavement, with the formal activity occurring behind it. There is a significant residential component displaying vertical land use mixing along the spine. On many sites retail uses are located on the ground floor and service activities on the second floor. There is a strong residential land use component along the spine above the economic activities. Along Bacus Road there are two dwelling units which are purely residential! One is a small house at the back of a site, while the other is an old house which has not been replaced.

The mixed uses along and adjacent to the spine vary extensively. Just behind the spine to the east (Bacus Road) the majority of the activities are motor-related retail and some motor-related industrial (repairs, etceteras). The majority of the clothing manufacturers are located behind the spine to the west, up to Marajh Road. These are generally multi-storey manufacture blocks which seem quite old. Outside the factories on the southern area between Soupan and Sigamoney Roads, there is a busy concentration of informal traders selling clothes from the clothing manufacturers. It is probable that these informal traders are in fact working for the manufacturers as they are selling the identical products directly outside the factory shops' door. There is also a degree of horizontal mixing of land uses with the sale of ready-made clothes in the front of the premises and the sale of cloth at the back.

The spine itself contains a wide diversity of formal and informal goods and services. These include: retail (food, clothing, durables, specialist, etceteras), manufacturing (clothing, metals, building, etceteras), services (food, motor, specialist and finance services) and places of entertainment (restaurants, casinos). The activities can be said to be people-oriented as they are convenience and necessity goods.

There are also varying sizes of businesses - some are small in terms of space used and number of employees; others are larger and well established. There are a number of small shops and a lot of informal vendors. As in the case of the clothing manufacturers, it is possible that the 'informal traders' are working for the retail stores themselves. An example is a vendor who sells creams and lotions outside the door of

a chemist with identical products just inside the door. It is the same with a wide range of goods.

The variety of economic activities encourages interaction with the residents because it increases their accessibility to goods and services which would not normally be available within a residential area. Some of the goods available along and adjacent to the spine include food (for example perishables, general groceries, butcher), clothing, durables (for example pots, blankets, etceteras) and specialist goods (for example motor traders, chemists, etceteras). Services include doctors, dentists, financial services, public phones and other specialist services. Manufacturing activities mostly include clothing, metals, building manufacture and vehicle repair. There are also places of entertainment including a hotel, restaurants, a few casinos and a call-girl service.

The majority of shoppers along the South Coast Road are black shoppers stopping off midway between work and residence (Seneque Smit Maughan-Brown, 1994). There is still a significant proportion of shoppers from Clairwood itself. The major shift, though, has occurred towards the clientele provided by the transport route. The use of transport itself is reported to have shifted from rail. The majority of shoppers come in by bus and taxi but there is still a large proportion who access the area by foot or by short bus rides from neighbouring areas (ibid.). This is apparent by the pedestrian activity present throughout the area. The spine itself is quite congested by pedestrians.

The shopping patterns of residents were identified in the 1994 Seneque Smit Maughan-Brown survey and 82% of the respondents did their shopping within the area, on a regular basis. The main reason for this was given as convenience; other reasons given were cheap prices and variety. Food and groceries were the main items bought, followed by clothing and durables.

The spine can therefore be said to provide a wide range of goods and services to the local population. The increased importance of people from outside the area to these activities and their thresholds only serves to increase the levels of functionality to the residents. The activities are sustained which increases levels of convenience. This displays the integrative nature of Activity Corridors which not only link residents with

the activities on the spine but also integrate people from the wider metropolitan area with these activities and thus benefit the local residents.

The residents are also functionally linked to the spine by the facilities. Namely, the schools and the church which are located along the spine. The movement of residents to these facilities will increase the thresholds for the economic activities and therefore the two activities reinforce each other. For example, mothers walk to the school to collect their children and in doing so purchase goods needed at the shops on the way.

As far as functional integration is concerned, one hardly notices the Southern Freeway as a barrier between the spine and the residential area. The links created by the diverse and multi-functional land uses ensure that there is much interaction between the residents and the activities along the spine.

The land uses in the residential area of Clairwood are summarised in Table 6 above. With 28% of the uses being purely economic, 13% are mixed use and 37% is purely residential. 20% of the lots are vacant with 1% being used by religious facilities, education or other uses. There is, therefore, a relatively low percentage of residential uses in the area itself. Counted with the mixed uses, 50% of the lots are residential or have residential components.

The mix of activities within the residential area does not benefit the local residents save when these activities are mixed with a residential component or when they are 'people-oriented' retail outlets. There are a limited number of tea-rooms and small stores which cater for daily needs distributed throughout the area. The majority of the economic uses, however, are non-people oriented activities which do not lead to interactions of any significance with the residents. Vehicle repairs, services and distribution outlets make up the majority of the economic land uses within the residential area. These are not considered to be compatible with the residential land uses as they generate high levels of noise and traffic. There is more heavy traffic within the study area than would normally be the case in a residential district.

Another interesting find by the study was that there was displeasure expressed at the location of the motor-related activities in the area because of noise and traffic

generation. Commercial activities, however, were generally acceptable. There are many cartage firms and industries which relate to heavy vehicles within the residential area - these generate a lot of traffic and it can be said that this negatively affects the residential component. In most cases the large trucks have to cross over on the other side of the road when turning corners in the narrow roads (which are not designed for heavy and articulated trucks).

The streets appear to be multi-functional in that they do not only cater for vehicular traffic. The high levels of pedestrian activity indicate that the streets also play a social role in the lives of the residents.

❑ *Public Transportation*

The public transportation can be argued to play an important functional role in the lives of the residents. A high number of buses and taxis pass through the area every day (see Plan No. 9). It has already been established that the station does not represent a very important link for the local residents. The presence of a number of different modes would mean that the spine has the ability to act as an integrator between the residents and the metropolitan region as a whole. An interesting occurrence is the day and evening sales of cloth to bus passengers from the Transkei. The inter-city bus stop is located within the residential area - the lot can be seen in Plan No. 5 - in Pine Road towards the pedestrian underpass. The stopping of buses here has led to the emergence of an informal market around the site (see photo below). The passengers then use the pedestrian underpass to access the shops on the spine, South Coast Road.

Photo No. 23:

5.4.4.3 Social Integration

Indians still make up the majority of the population in Clairwood. Many members of the Indian community have long standing connections with the area and with each other. Years of conflict with the Durban City Council has led to a tightly bound community. This was evident during a number of field trips into the area: there were always people walking around and talking over fences and neighbours chatting, etceteras.

There is a fairly wide spread over the age groups with 34% of the population being below working age (18 years) and 62% being of working age. Only 21% of the population's income breakdowns are detailed but the majority of these are in the higher-income category - earning above R2600 a month. The area, contrary to popular belief, therefore seems to have a reasonably high income earning population.

There has been a major influx of squatters into the area recently. The squatter settlements are concentrated in three areas. The Cherry Road settlement is the largest consisting of at least four lots and having a relatively high density of dwelling units. The Ganesh Road settlement is smaller as it only consists of three lots. One

of these lots has a derelict house on it which appears to provide water to the shacks on the other two lots. It also serves as a shebeen. The settlement on the corner of Flower and Sir Kurma Reddi Roads only consists of two sites and a few dwellings.

The location of the facilities along the spine would serve to ensure that the thresholds necessary to support the schools can be maintained. This then benefits the residents and has also protected them from lower thresholds. During the last decade the population of Clairwood has decreased (Seneque Maughan-Brown SWK, 1995c) as is evident by the derelict buildings and vacant lots. With the location of facilities within residential 'neighbourhoods' this would normally have led to the non-viability of the schools. This has been prevented and the continued benefit of the local residents ensured.

It can be argued that the nature of the social profile of the residents has encouraged their integration with the spine. The early importance of the local population to the activities and the strong links (in terms of ownership - Seneque Maughan-Brown SWK, 1995b - and in terms of employment) between the residents and the activities along the spine would have contributed to their continued interaction with and use of these activities. As far as employment in the 1994 Seneque Smit Maughan-Brown study is concerned, 40% of the respondents worked within the area itself. This indicates a strong link between place of work and place of residence for the Clairwood residents.

The strong sense of community which has been established by the political struggles have increased the security of the area. At all times during the day there is pedestrian activity throughout the area; housewives chatting over fences, people walking to the corner shop, children playing in the streets and walking to and from school. This activity creates a safe environment. The Seneque Smit Maughan-Brown 1994 survey reported increases in crime within the area and this was attributed to both the increase in economic activity and squatters. On the 12 August 1995 a temporary police station was erected in the area. The policeman questioned reported that there was not much crime in the area and most of the crime that was reported occurred outside the area.

The safe environment is apparent by the number of youngsters which are allowed out without supervision. Photosheet ~~No 22~~ interleaved shows a photograph of children coming home from school (being fetched by the eldest) walking down Pine Street (the walkway is in the background). The second photo on the sheet is taken looking down Pine Street (where the children are heading) and indicates the pedestrian activity. The area was observed to be just as active over the weekends with people strolling down the streets and children playing.

The levels of activity are definitely less than those 'prescribed' by Jayne Jacobs (1961) but they do contribute to increased surveillance and therefore better safety within the area. This would encourage integration because people are encouraged to interact with their environments and it is convenient to access the facilities and activities along the spine. The streets play a social role in the environment.

5.4.5 Conclusions - Clairwood

Integration in Clairwood, between the residential land use and the spine, provides a good opportunity to identify what the important influences on integration might be. This does not preclude others and it does not mean that in every case, what exists in Clairwood will create integration. The dynamics, however, give a good idea on what contributes to diverse environments and what some of the elements behind these are.

The spatial barrier of the Southern Freeway provided an opportunity for the study to identify the importance of functional integration. Despite this barrier, the area displayed relatively good levels of accessibility, clarity and orientation - particularly with respect to pedestrian movements and linkages. Pedestrian movement is not purely spatial but also related to function and social breakdowns.

The dominance of functional elements in achieving integration, highlight an important aspect of urban environments - land use mixing is an essential element of creating environments which work for their users. A good mix of people-oriented uses generates conditions which benefit all. Residents enjoy a higher level of service and convenience. Economic activities enjoy a wide range of support. The mixing of these opportunities creates environments which are active, vibrant and diverse.

For the spine itself, the presence of residential land uses is a bonus. The area is not perceived as an economic area only and activities which serve the local residents will locate these (food and entertainment in particular). These all generate further activity. An example here is the existence of night shopping in the area and how these people also reinforce the entertainment uses, the hotels and bars.

The social profile of Clairwood is not very mixed but the strength of it lies in the close ties and many interactions. The neighbourhood is a lot safer because of the nature of the community - this also increases integration.

5.5 Underlying Factors

The two study areas differ quite considerably in extent and nature of integration. Both Umgeni Road and South Coast Road represent major transportation spines with high levels of traffic. A significant proportion of the activities in both areas are motor / transport-related activities. This is about where the similarities stop. Each area has a unique set of dynamics at play. These differences highlight various implications for integration. But before these implications can be explored, it is necessary to detail some of the underlying influences on urban form in the study areas.

5.5.1 Umgeni Road

Plan No. 10 indicates the zoning regulations in the study area. The area falls within the Berea North Planning District. The primary purpose of the zoning regulations is to "protect the residential amenity"[9] and to prevent the secretion of business uses into the residential areas. The zoning plan has been the primary influence on the development of the area. Strip development was not considered desirable until the popularity of the Activity Corridor. The dominant ideology was the deliberate separation of land uses with the maintenance of homogenous land use zones. Allowances were made for general shopping on certain street corners which were to provide for the daily grocery shopping needs of residents. Other than that the

[9] Besthwetherick, B (1995)

facilities (schools and churches) were planned on a formula basis, that is, per number of dwelling units.

The actual spatial distribution of activities in the study area has occurred on a piecemeal basis with the outward spread of the Berea. Individual land holdings were developed as needed and this has led to the absence of an overall spatial plan. Instead, pockets of development layouts have occurred with road patterns in each fitting together as in a jigsaw puzzle.

The General Shopping zone allows for some mixing of land uses in that it is possible to have a residential component on the condition that the ground floor is for shopping only - see Appendix 2 - for zoning regulations.

There is an area to the south of Churchill Road above Percy Osborne Road which has been zoned as an interface area - there is also a small section along Churchill Road within the study area. This zone acknowledges the business activities by retaining the residential zoning but allowing non-residential uses on a small-scale. That is, they must have a residential component and they can only use a small section of the site for business activities.

The area adjacent to the spine is zoned for general business use. The General Business 2 category allows for industrial uses but not for residential. This exclusion of residential land uses does not facilitate any land use mixing. Mixing with residential uses where desirable would promote diversity and encourage a greater mix of economic activities as a more diverse threshold population would ensue.

The development control regulations however, have recently been relaxed. In residential areas there is a more positive attitude towards mixed uses. This is based on the proviso that the residential land uses remain the principle use. The special consent application procedure which was obligatory is no longer required. Responses are made, however, to complaints from neighbours and affected people. This softer approach will promote small business development within residential areas as people make use of the opportunities.

As far as the area behind the spine, along Percy Osborne Road, is concerned the City Council sees it as a Catch-22 situation. Their aim is to protect the residential amenity. This is hampered by the ageing and poor condition of the building stock in the area. Business uses tend to improve the building stock as they can afford to renovate the buildings.

The extent to which the activities along the spine move up and 'infiltrate' the primarily residential area will depend upon a variety of forces. It can be said, however, that the zoning regulations have influenced the spatial layout of the study area to a significant extent. It is this rigid concentration on keeping uses separate that has contributed to the monotonous land use areas within the study area and many areas within the metropolitan region. This separation inhibits integration between land uses and different activities.

The Activity Corridor Theory calls for higher residential densities adjacent to the spine and decreasing away from the spine. The zoning plan for the study area does allow for this density pattern. The zoning for the area immediately adjacent to the General Business 2 is General Residential 2. This allows for higher densities to be developed. The minimum plot size is 900m² and the regulations allow for a height of 25 metres. See Appendix 2 for the zoning regulations. Adjacent to this is a General Residential 1 zone which is also based on a 900m² lot size and the same regulations but prohibits residenital uses. Further away from the spine, towards the west of the study area, the lower density zones are placed. These include maisonettes and three different special residential zones: Minimum plot sizes of 400m², 900m² and 1800m². The zoning therefore aims to facilitate the type of residential orientation which has been said to promote integration. The spatial organisation of residential densities according to the zoning plan would have facilitated a structure which would appear to be oriented towards the spine - with the higher densities closer to the spine.

5.5.2 Clairwood

Clairwood has a varied and complicated zoning history. Plan No. 7 indicates the land use zones. Clairwood was incorporated into the Borough of Durban in 1932. In 1943 the City Council initiated plans for the industrial development of Clairwood and it was zoned for industrial in 1954. After objections lodged the Town Planning Scheme was

amended to zone Clairwood as Special Residential. In 1957 it was decided that light industrial uses would be allowed by special consent.

In 1959 the City Council adopted a resolution to highlight the "unsuitability of Clairwood as a residential zone and for the entire zoning matter to be clarified" (Durban City Council, c1992/3). The Town and Regional Planning Commission then agreed to this subject to conditions that included the satisfactory accommodation of residents elsewhere. What followed was a continual process of debate (and flow of resolutions) between Durban City Council, the Town and Regional Planning Commission and the Residents (in the form of the Indian Affairs Advisory Committee with the Clairwood and District Ratepayers' and Residents' Association). This culminated in the decision taken at a public meeting on the 28th February 1982 that Clairwood be developed as a residential area. On the 8th March 1986 it was formally stated that Clairwood would remain residential.

Between 1953 and October 1992, 75 Appeals had been lodged with the Town Planning Advisory Board with respect to properties within the Clairwood Structure Plan area. These were dealt with as follows:

Table 10: Appeals between 1953 and 1992

Action	*No.*	*%*
Allowed with or without conditions	27	36.00%
Dismissed	18	24.00%
Adjourned sine die	4	5.33%
Withdrawn	19	25.33%
Abandoned	4	5.33%
Outstanding	3	4.00%
TOTAL	75	100%

This zoning history has led to a high level of land use mixing within Clairwood. If one looks at the Land Use Plan No. 7 one can see the extent of mixing which occurs. It could possibly be argued that this would generate diversity and therefore integration. This, however, is not completely true because of the type of mixing that has occurred.

Where retail land uses have occurred there have been no problems. When the land uses which are placed amongst the residences are of an industrial nature, then problems are created. High levels of noise and traffic are generated. The traffic consists mainly of heavy vehicles which jeopardises the residential amenity and

safety of the area. Because of this history most of the land uses within the 'residential' area are of a light and service industrial nature. The retail and service activities include panel beaters, sales of parts, repairs, scrap yards and generally disruptive activities which involve heavy traffic.

There is, however, more of a mix of uses (which do relate to the residents) than would be the case if there had not been any doubt as to its residential zoning. This study would argue that this has had some impact on the nature of integration. Not only is the community a more coherent whole than would normally be the case (see 5.4.4.3 Social Integration above) but they also enjoy a higher level of service within their residential area.

The area surrounding the spine itself is zoned General Shopping. This is a fairly facilitative zone as it allows for residential land uses and offices. Service industry is allowed by special consent of the Council. This zoning has then facilitated the development of a rich and varied activity strip along the spine. There is much vertical land use mixing with retail on the ground floor and residential flats above.

The General Industrial zone which lies immediately behind the spine allows for any industrial use (other than extractive or noxious) and special consent use for offices. Above (west) the spine the predominant use is industrial. The positioning of this general industrial zone here has played a role in the location of retail and specialised services along the spine. There is a large number of clothes shops as well as tailors and outfitters (especially school uniforms) which are closely related to the manufacture of cloth and clothing in the vicinity. This close proximity would help to keep retail costs down (due to decreased transport costs) thereby making it an attractive area to shop in. The Seneque Smit Maughan-Brown 1994 study respondents replied that cheaper goods and convenience were some of the main reasons for shopping in Clairwood. The nature of the activities along the corridor thus promote interactions with the residents and integration is therefore encouraged.

The zoning in Clairwood has had an influence on the dynamics within the area itself and have contributed towards the levels of integration which exist - if not directly then indirectly.

Race zoning and influence on income levels / facilities and type of environment.

The emphasis on designing streets and roads primarily for vehicles and then, if then, for pedestrians, would have an influence on levels of activity. Designers tend not to favour pedestrians by designing roads with narrow pavements, far between cross-over points and non-people friendly environments. The emphasis is on the efficient movement of vehicles from one point to another.

SECTION THREE: CONCLUSIONS

CHAPTER 6 SYNTHESIS AND CONCLUSIONS

The two case studies have been subject to different dynamics and so different levels of integration exist. They do not provide adequate examples for the illustration of well-integrated environments. Important lessons can be learnt however, which can indicate elements which mitigate and elements which promote integrative dynamics.

A comparison of the elements of integration which exist within the two study areas is therefore expected to highlight issues which would contribute to the theory on integration. The analysis of the case study areas has been carried out in such a way as to test them against the theory set up in Chapter 4. The conclusions from the analysis are summarised in the diagram below. They are then discussed in more detail.

Briefly, Clairwood exhibited integration between residents and the activities along the spine. Umgeni Road, at best, exhibited potential for some integration to occur in the future and this is a function of the development of Windermere Rpad. Umgeni Road fared very badly when tested by the integration theory set up in Chapter 4. What it managed to indicate, however, is what prevents, or hinders, integration. It must be remembered that integration is a result of specific environments and has not been planned for.

Clairwood, on the other hand, fared reasonably well when tested by the theory, This was interesting considering the spatial barrier placed between the activities along the spine and the main residential area. The importance of functional integration as an essential consideration was highlighted by this area. Planners often concentrate on spatial issues - Clairwood has shown that this can often be misleading. This is perhaps illustrated by the fact that the present Structure Plan for Clairwood pays little or no attention to the levels of integration between the residents and the spine.

CLAIRWOOD

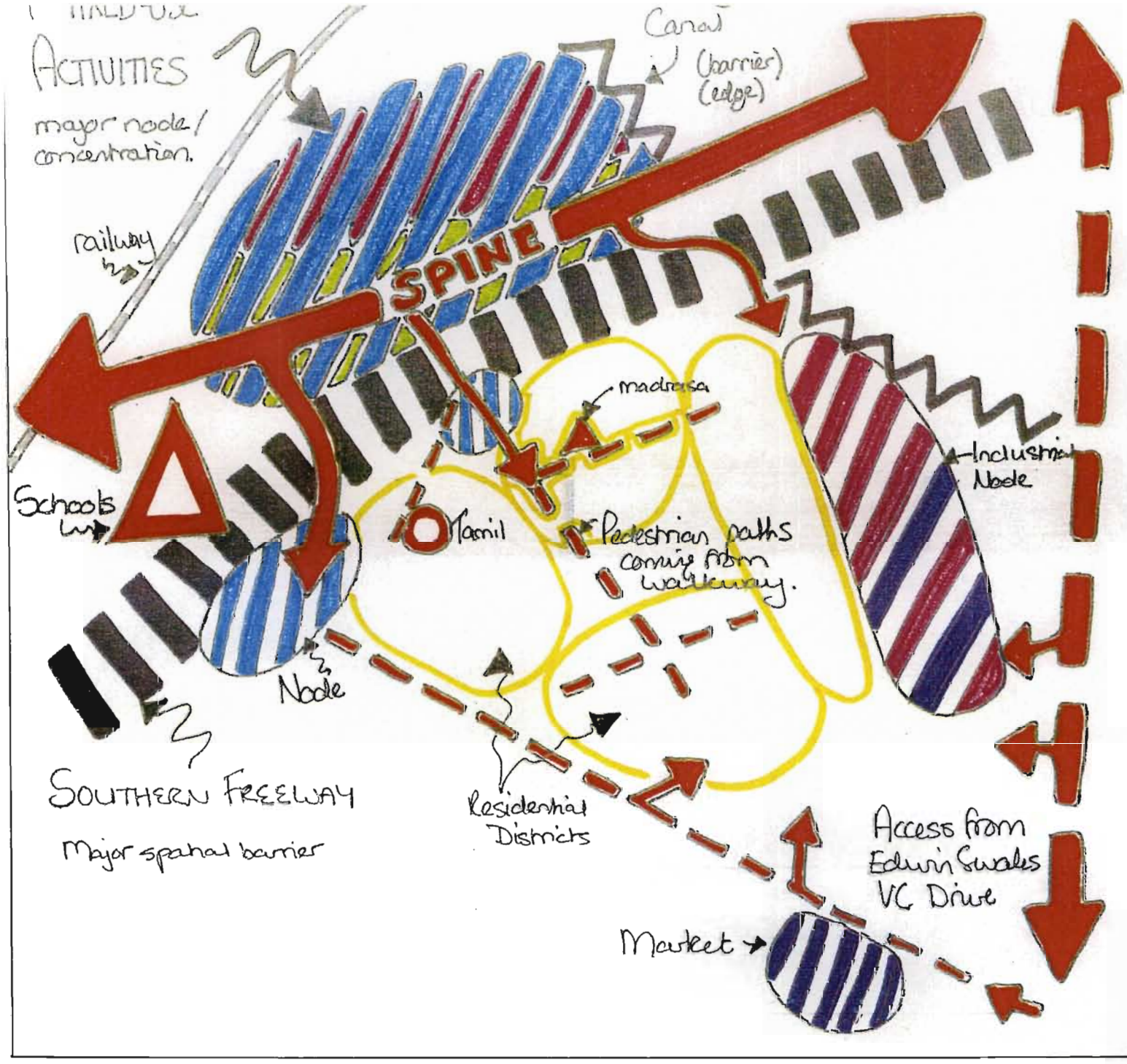
PLAN NO. 7
LAND USE

- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- INFORMAL RESIDENTIAL
- MIXED USES
- COMMERCE-BASED ACTIVITIES
- OFFICES / BULK ACTIVITIES
- LIGHT INDUSTRIAL
- EDUCATION
- RELIGIOUS
- TRANSPORT-RELATED USES
- OPEN SPACE
- MUNICIPAL
- INFRASTRUCTURE
- VACANT

PREPARED BY: LISE C. LILLEBY
DATE: DECEMBER 1995

SCALE: 1 : 6 000

0 100 200 300 400 500 m

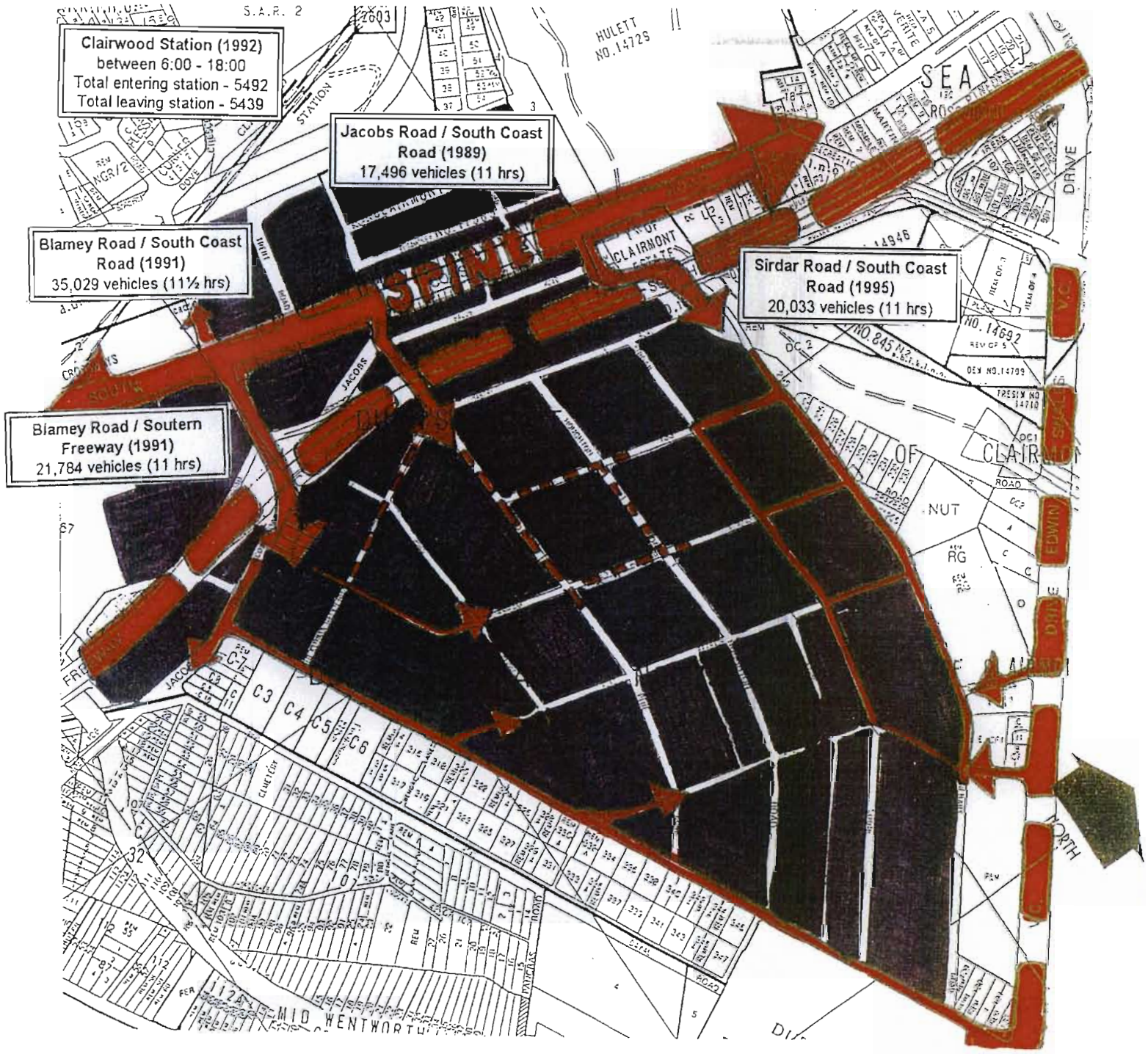


PLAN NO. 8
VISUAL ANALYSIS

ROUTE
EDGE
BARRIER
NODE

PREPARED BY.	LISE C. LILLEBY
DATE.	DECEMBER 1995
(SCALE.	1 . 6 000)

0 100 200 300 400 500m



CLAIRWOOD

PLAN NO. 9
TRANSPORTATION

MAIN ROUTE

SECONDARY ROUTE

ROAD LAYOUT

PREPARED BY.	LISE C. LILLEBY
DATE.	DECEMBER 1995
SCALE.	1 : 6 000

0 100 200 300 400 500m

UMGENI ROAD

PLAN NO. 10
ZONING

- SPECIAL RESIDENTIAL
  MINIMUM PLOT SIZE 400M2
- SPECIAL RESIDENTIAL
  MINIMUM PLOT SIZE 900M2
- SPECIAL RESIDENTIAL
  MINIMUM PLOT SIZE 1800M2
- MAISSONETTES
- GENERAL BUSINESS
- GENERAL RESIDENTIAL 1
- GENERAL RESIDENTIAL 2
- INTERFACE AREA
- INSTITUTIONAL
- ROAD RESERVE
- EDUCATION
- GOVERNMENT AND MUNICIPAL
- GENERAL SHOPPING
- PETROL FILLING STATION
- PUBLIC OPEN SPACE

PREPARED BY. LISE C. LILLEBY
DATE. DECEMBER 1995

SCALE. 1 : 6 000

0 100 200 300 400 500m

CLAIRWOOD

PLAN NO. 11
ZONING

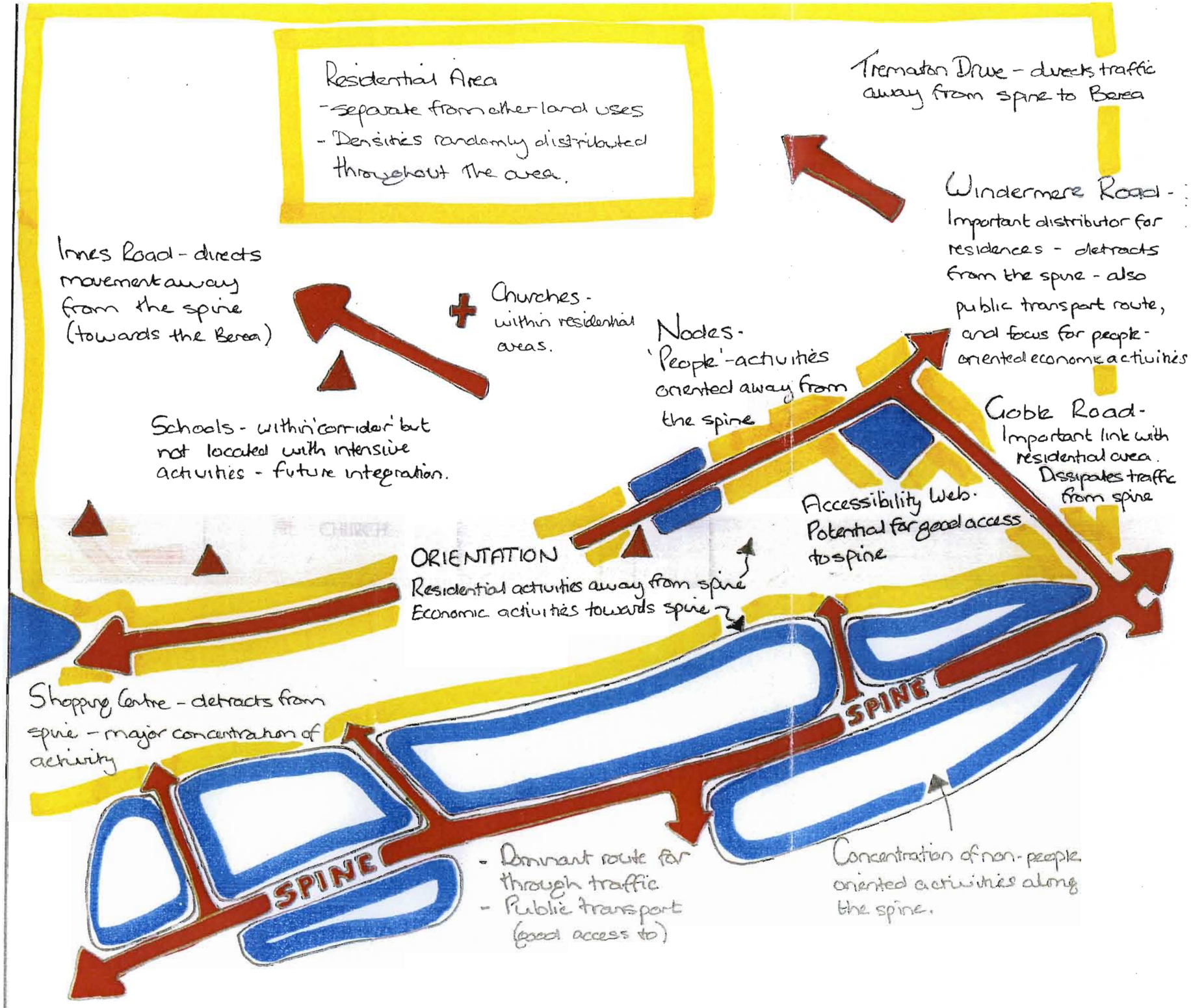
- SPECIAL RESIDENTIAL
- ROAD RESERVE
- EDUCATION
- GOVERNMENT AND MUNICIPAL
- GENERAL SHOPPING
- GENERAL INDUSTRY
- NOXIUS INDUSTRY

PREPARED BY:	LISE C. LILLEBY
DATE:	DECEMBER 1995
SCALE:	1 : 6 000

0 100 200 300 400 500m

UMGENI ROAD

PLAN NO. 12
SPATIAL INTEGRATION



TRANSPORT ROUTE

ECONOMIC ACTIVITY

RAILWAY

SCHOOLS

CHURCH

PREPARED BY: LISE C. LILLEBY

DATE: DECEMBER 1995

SCALE: 1 : 6 000

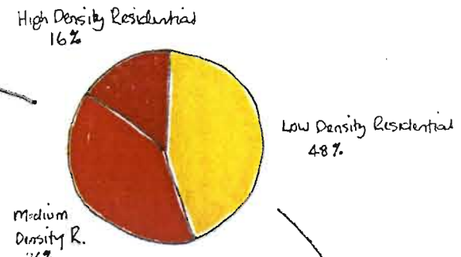
0 100 200 300 400 500m

UMGENI ROAD

PLAN NO. 13
FUNCTIONAL INTEGRATION

Facilities - located within residential area - decreases functional interaction with spine

Residential Area
Primary use residential
Land-use separation
No vibrancy or diversity
"boring" environments



Windermere Shopping Centre
Well-used concentration of people-oriented activities including retail, services as well as offices and a residential component

Detract from Spine and prevent integration

Nodes
of mixed use activity
'people-oriented' activity

WINDERMERE CENTRE

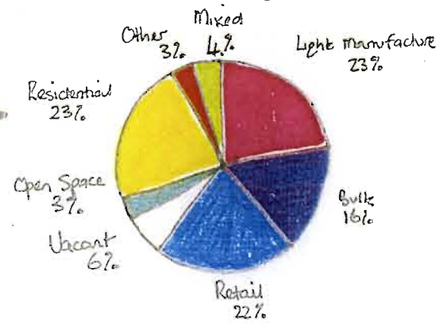
WINDERMERE ROAD FUNCTIONALLY IMPORTANT PUBLIC TRANSPORT ROUTE FOR RESIDENTS

Monofunctional Roads
designed primarily for the motor vehicle

SPINE

Transportation
Many buses and taxis;
Adjacent railway - but not utilized by residents.
Potential for integration

Area of intense economic activity
Do not encourage integration with residents because are not 'people-oriented' activities. Mostly motor-related. Highlights the importance of mixed and appropriate uses.



- TRANSPORT ROUTE
- ECONOMIC ACTIVITY
- RAILWAY
- SCHOOLS
- CHURCH

PREPARED BY: LISE C. LILLEBY
DATE: DECEMBER 1995

SCALE: 1 : 6 000

0 100 200 300 400 500m

CLAIRWOOD

PLAN NO. 14
SPATIAL INTEGRATION

Accessibility to Public Transport
- Spine within walking distance
- Spine accommodates different modes - bus and taxi
- Rail parallel to spine

The location of a varied mix of intensive activities along the spine is a powerful tool for integration

Southern Freeway
Spatial barrier - overcome by 3 access routes - 2 motor and 1 pedestrian

SPINE

Facilities - Orientation to spine facilitates integration and increases accessibility

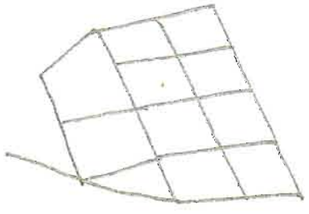
Pedestrian linkages
Important element of integration and accessibility

Location of Economic Activities detracts slightly from the spine - activities not as intensive as the spine and lower densities

Dissipation of movement onto Edwin Swales Dr

Residential Area - spatial mixing with economic activities
- Plays down the importance of the spine
- low density dwelling uses with no specific spatial orientation or patterning

Road Layout
within residential area - grid layout but no hierarchy therefore limited orientation



- TRANSPORT ROUTE
- FREEWAY
- LIGHT INDUSTRIAL
- BULK / OFFICES
- COMMERCIAL(MOSTLY)
- MIXED USE
- SCHOOL
- CHURCH
- RAILWAY

PREPARED BY. LISE C. LILLEBY
DATE. DECEMBER 1995

SCALE. 1 : 6 000

0 100 200 300 400 500m

CLAIRWOOD

PLAN NO. 15
FUNCTIONAL INTEGRATION

Diversity achieved by the mix of 'people-oriented' uses along the spine.

Spine dominant route for traffic and notably for public TRANSPORTATION - enhances functional integration.

People-oriented activities generate interactions and vibrancy

MIXED USE SPINE

[Thresholds generated by freeway]

Facilities

crease activity versity and hresholds schools religious facilities

Economic activities within residential area

Movement of people to activities on the spine

Residents - strong coherent group which demand goods and services: some threshold created.

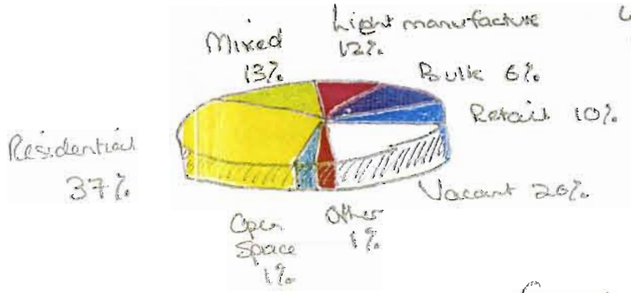
Dissolution of Activities from spine into residential area.

Mostly bulk as in distribution depots and therefore does not negatively influence functional integration.

Not oriented to people and therefore not fully compatible with residential land use

Integration - facilitated by a strong mix of appropriate uses and facilities along the spine.

Economic activity within residential area:



NB

Concept of Complementarity.

PREPARED BY: LISE C. LILLEBY
DATE: DECEMBER 1995

SCALE: 1 : 6 000

0 100 200 300 400 500m

Figure 11: Integration and the Case Study Areas

SPATIAL INTEGRATION

	UMGENI ROAD	CLAIRWOOD
❑ ORIENTATION - ECONOMIC ACTIVITIES	●	◓
❑ ORIENTATION - RESIDENTIAL ACTIVITIES	○	○
❑ ORIENTATION - FACILITIES	○	●
❑ CLARITY OF STRUCTURE	◓	●
❑ ACCESSIBILITY WEB	◓	○
❑ PEDESTRIAN MOVEMENTS / LNKAGES	○	●
❑ HIERARCHY	○	◓
❑ ACCESSIBILITY TO SPINE / FACILITIES	○	◓
❑ ACCESSIBILITY TO PUBLIC TRANSPORT	○	●
❑ DENSITY GRADIENTS	○	○
❑ QUALITY OF SOCIAL SPACE	◓	○
❑ GRAIN / LAND USE MIX	○	◓

FUNCTIONAL INTEGRATION

❑ DIVERSITY	○	●
❑ MULTI-FUNCTIONALITY	○	●
❑ LAND USE COMPATABILITY	◓	◓
❑ TRANSPORTATION	◓	●

SOCIAL INTEGRATION

❑ SOCIO-ECONOMIC PROFILE	○	○
❑ SAFETY AND SECURITY	○	◓
❑ INTERACTION	○	◓

6.1 Spatial Integration

Refer to Plans No.12 and 14

❑ *Orientation:*

The spatial orientation of economic activities in both areas is toward the spines. They both provide a focus for business and commercial activities which rely on the high thresholds available. The extent of orientation does differ slightly in that Clairwood has a dissolution of activities into the residential area. This tends to dilute the degree of orientation of economic activities - but not to such an extent that the spine offers no dominant route.

The nature of economic activities differs between spines. Umgeni Road's activities are not reliant on pedestrian traffic. Their custom is mostly provided by the vehicular traffic along the spine. The greater part of the more 'people-oriented' activities are oriented towards the residential area along Windermere Road and the bulk at the shopping centre itself. This is a result of zoning plans to 'protect the residential amenity', the relatively low densities and the tendency of the residents to shop at centres causing a dissipation of threshold.

Clairwood's activities are more people-oriented and they rely on pedestrian traffic which is provided by both the residents and people from the greater metropolitan region. Public transport is therefore more important within the Clairwood study area. The author would argue that the location of the light industry / manufacturing firms in the area, particularly with respect to clothing manufacture, has been a major contributor to the concentration of retail and service activities along the spine. Many of these activities are related, tailors and clothing stores for example. The spine, being an important link between the harbour and airport, would have provided an appropriate orientation for these activities.

The nature of economic activities along the spine is very important for any levels of integration which are going to occur with residents. This indicates a strong link with functional integration. Without an appropriate spatial orientation of activities functional integration between them is not facilitated.

Levels of integration are also facilitated by the spatial orientation of the residential component onto the spine. The presence of residential land uses along the spine would also serve to influence the nature of facilities there and encourage integration of the area as a whole. Clairwood's residential land uses are linked to the spine in that there are residential land uses present. As has been noted, however, the freeway does form a spatial barrier to this orientation. The location of facilities along the spine does have a mitigating effect on the barrier. Umgeni Road by contrast does not have an orientation of its residential component towards the spine and so does not promote integration between activities. The intensive facilities (schools and churches for example) are located within the residential area. The relative importance of the roads serving these facilities dissipates the focus from the spine.

- *Clarity of Structure:*

In both the study areas it was decided that the spines did act as a natural focus for the location of like-activities. The spatial location of people-oriented activities along Umgeni Road will be discouraged by the lack of people within the area, that is, pedestrians and sufficient densities to generate the necessary thresholds. Similar types of activities will focus along the spine - that is, light industrial, service industrial and motor-related activities (retail, industrial and service). Integration between the residences and the economic activities along the spine will therefore be very limited in this area.

The spine provides a clear structure for the location of activities in that it contains high densities. This is evident by the very diverse and intense nature of the activities themselves. A possible influence of the freeway in that it spatially cuts off the spine, is that it could serve to decrease the spines dominance. The dispersal of economic activities into the residential areas has not been because of a significant lack of clarity of the spine but rather because of the particular zoning history of the area.

Clarity is influenced by the differing degrees of 'readability' of the environments: Umgeni Road, it can be argued, is readable. Districts are reasonably clear (See Visual Analysis Plan No. 4 above.) as there are specific areas of use and building type: The business area along the spine, the higher income residential grouping along Goble Road and Venice Road, and so on. Because of the nature of activities and this clarity of structure, the separation of land uses may be perpetuated. Given

time and a loosening of regulations, perhaps this area does have the potential to develop mixed uses and a diverse environment - this would not serve the spine, however, because of the relative importance of Windermere Road and Innes Road to the residential area.

Clairwood, to the east of the freeway, is not as legible as Umgeni Road. Given the City Council's intention to retain Clairwood as a residential area, the more bulky activities may prefer to be located nearer to arterials and access routes. That is, outside and on the edges of the residential areas as opposed to within. This would improve the clarity of structure as the residential area would be 'protected' behind the economic activities on the surrounds and form a distinct district.

If both study areas are analysed it is apparent that clarity of structure can be used to promote and hinder integration. If the existing structure is not focused on a spine but is easily identifiable and read, then this will work against the generation of 'corridors'. Clarity of structure appears to be more a consequence of particular environments than a tool by which to achieve integration. A clear, legible urban structure, within this context, will promote the necessary conditions for integration.

- *Nature of the Connecting Elements:*

The accessibility web within the Umgeni Road area does not facilitate integration because the road layout tends to divert residential traffic away from the spine. The relative importance of Windermere Road and the opportunities created away from the spine contribute to this. Windermere Road has been shown to be a relatively significant road and this detracts the local flows from the spine itself. This is exaggerated by the location of the schools closer to Windermere Road than the spine. The Visual Analysis Plan No. 4 gives an idea of how the distributor roads detract flows from the spine.

In Clairwood the connecting elements between the bulk of the residential land uses are minimal. The pedestrian walkway is arguably the most important connection for the residents themselves. There is virtually a constant flow of pedestrians through the walkway, to and from the spine. The Blamey Road / Jacobs Road intersection is a relatively busy one and important to the residents. This was illustrated by the residents' refusal to accept the City Council's proposal to close off (and pedestrian-

ise) the Richborough Road and Flower Road access points onto Jacobs Road (McIntosh, 1995). The Sirdar / Archary Road link, being the only other link to the South Coast Road is also an important one. Spatially speaking then there is not a good connection between the main residential area of Clairwood and the spine.

The Southern Freeway may be argued to be a spatial barrier between the two segments of Clairwood but it can also be argued to provide accessible links between the South Coast Road and the metropolitan region as a whole. This, however, does nothing for integration with the spine on a local scale. This study is primarily concerned with local-level dynamics.

The nature of connecting elements therefore seems to be an important one when it comes to the dominance of, and the role played by, the spine. The spine needs to be an important through route which connects different areas and this needs to be reinforced by other connecting routes and elements. There should be a clear hierarchy with the interceptor routes guiding traffic from the areas behind and towards the spine itself.

- *Pedestrian Movement*

There is a significant difference in pedestrian levels between the two study areas. Umgeni Road has low numbers of pedestrians. Pedestrians within the residential area are mostly restricted to domestic workers and elderly people - the rest of the population appear to travel to their destinations in cars. Clairwood on the other hand is constantly trafficked by pedestrians. The spine itself is particularly busy because of the presence of people from the Durban Metropolitan Region as a whole and farther afield. The informal bus stop located in Pine Road caters specifically for buses from Transkei and Swaziland[10], the passengers of which walk through the underpass to access the shopping opportunities along the spine.

The pedestrian movement is not restricted to the spine alone. The pedestrian traffic infiltrates the entire residential area. The pedestrian linkages are, therefore, an important form of integration with the spine. People walk to and from the shops and facilities (schools, church and hotels for example) along the spine.

[10] Source: questions directed at some of the passengers, 1995

The layout of the areas differs considerably. In Umgeni Road the activities, are concentrated at a shopping centre and two small nodes. The shopping centre is an inward focused centre. In Clairwood the activities are extroverted and oriented to the spine. The shopping centre is mostly reliant on motorised transport and the activities are oriented into the centre. If these activities are oriented outwards onto the street then pedestrian activity is encouraged.

The difference in pedestrian activity between the areas is also contributed to the nature of the activities themselves, the socio-economic profiles and the social cohesiveness (and resultant interactions) between Clairwood residents.

- *Hierarchy:*

The study areas do not exhibit particularly strong road hierarchies. Umgeni Road is more important on a metropolitan scale while Windermere has been argued to be more important for the residents. This is substantiated by the levels of vehicles carried by both during the day (see Plan No.5). Clairwood does not have a strong hierarchical ordering. The spine when compared to the residential roads is the dominant route and so can be argued to be a focus to some degree. The spine may be a significantly busy road and may contain much activity but the Southern Freeway and Edwin Swales VC Drive are also major arterials and so detract from the absolute hierarchical dominance of the spine in terms of road order.

There are also no density patterns to establish or reinforce any hierarchy which would boost the spine. This is also true for clarity of structure which is lacking in both study areas. A strong hierarchy creates a specific pattern of accessibility and therefore of opportunities. This will tend to encourage diversity as different activities will be able to respond to the different specificity's of place. A hierarchy can then be used as a structuring element for encouraging vibrant environments and for the generation of a logical spatial order around a spine.

- *Accessibility:*

For both areas levels of accessibility are not only related to the virtual ease of access to facilities but also the layout of the roads and the type of activities to be accessed. In Umgeni Road the facilities and the spine itself are within easy walking distance for

most of the study area. The problem being that this is not made use of. The interactions between the land uses on the spine and the residents have been described as minimal in which case accessibility does not seem to play such an important role.

Accessibility to the spine is, however, reduced by the importance of Windermere Road and by the nature of the little lanes which occur between Windermere, Percy Osborne and Umgeni Roads. Adrain Road only links to the south-bound lane of Windermere Road while Livingstone Road only links to the north-bound lane of Umgeni Road. These limit the usability of these roads and tend to reduce the accessibility of the spine. Clairwood's limited spatial accessibility has been discussed above. The internal grid layout of the roads, however, does make the spine relatively accessible for pedestrians. The main channels lead towards the spine and the pedestrian underpass - that is, their main direction is towards the spine.

Integration would be facilitated by high levels of accessibility and this becomes more important when pedestrian activity is the dominant mode of movement for the residents. The location of a wide range of activities within walking distance is perhaps the main elements here. Barriers like the Southern Freeway may be overcome with the inclusion of access routes.

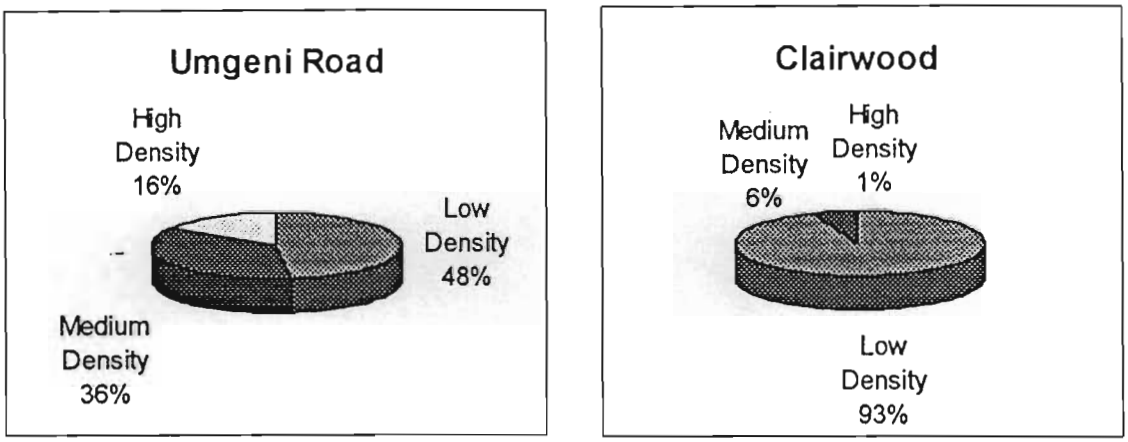
The spines in both areas provide good access to public transportation facilities. In Clairwood this is utilised more than in Umgeni Road. The railway in both study areas is relatively accessible but not utilised. Rail is not considered a safe alternative. Accessibility to public transportation does not contribute to any levels of integration within the Umgeni Road study area. Within Clairwood the accessibility to public transport along the spine is made use of and does tend to contribute to integration between residents and the spine, as well as the metropolitan region in general.

- *Density:*

Density patterns in both study areas do not contribute to integration. In Figure 12 below the distribution of lots amongst different densities is illustrated. Low density dwelling units are the largest portion in Umgeni Road but there are also significant medium and high density dwellings. This is a positive feature in that it indicates that the population are not averse to higher densities. This area may well be open to

densification. There is no logical spatial ordering of densities. They are quite randomly distributed throughout the area although some concentrations do exist. (PHOTO??) The zoning plan (Plan No. 10) does provide a possible density pattern and this could possibly emerge in the future with densification. A problem with any significant densities which may be generated is that they may be dissipated by Windermere Road and to the Windermere Centre south of the study area.

Figure 12: Residential Density Types in the Study Areas



There is, therefore, a good mix of residential densities in Umgeni Road, Clairwood however, consists mostly of single dwelling units. The graph above indicates the densities in the residential area and excludes the 15% of lots in the study area that are of mixed use. There are 87 mixed use lots within the total study area and 56 in the residential area - this leaves at least 31 mixed use lots which are situated along the spine. These are mostly in the form of high density dwellings. That is, economic uses on the first and maybe second floor with residential flats above. Photo No.?? below indicates some of these mixed use flats. The 1% for high density lots indicated on the graph does not include these mixed use residential lots on the spine.

Clairwood, therefore, exhibits low densities save the few residential flats above the economic activities along the spine. The low densities lead to low thresholds which would have an effect on the levels of integration with the spine. The spine within Clairwood (which previously had a higher population) did initially serve the local threshold. It is only in recent years that the metropolitan consumers became more important in providing a threshold for activities. Because of the high number of vacant lots and the low densities the residential component of Clairwood can no

longer be considered vital for the activities along the spine. This does not decrease the levels of integration but it does change the role that densities play.

The actual gross densities of the Umgeni Road and Clairwood study areas are 42 and 31 people per hectare, respectively. It becomes apparent that density alone is not an essential element of the generation of activity along a spine. Clairwood has a relatively low density but the metropolitan importance of the spine generates sufficient thresholds for diverse activities. What is important is - if integration between the surrounding areas (and the primarily residential areas) and the spine is to occur, then densities do need to be generated. There is, however, also a need for an appropriate socio-economic profile and for adequate functional linkages. The residential area of Umgeni Road, with a higher density, does not interact with the spinal activities to any extent - yet Clairwood with its lower density is integrated with the spine. The densities in the study areas are not sufficiently high to allow for comment on their role in generating thresholds.

❑ *Permanent Physical Objects and the Quality of Social Space:*

These do not appear to be of any particular significance within the study areas. The study areas are, however, quite different. Umgeni Road study area varies between the older building stock in the east and the newer buildings in the west. The western area is newer, better looked after and the quality of the social space above Windermere Road is a lot more positive than that on the east. Umgeni Road itself is a mix between new and old. Photosheet No.?? illustrates some examples of the different building stock within the area.

Clairwood does not exhibit any positive influences on integration if one looks at the nature of the interfaces. Refer to Photo No. 24. The area is badly littered and the building stock is generally old. Clairwood exhibits amazing diversity in its building stock. There are squatters juxtaposed with new houses and run-down dwelling units. There is a thorough mix of housing types. Economic-activity building types are also extremely diverse, ranging from old dwelling units to six storey manufacturing blocks. There does not, therefore, seem to be any connection whatsoever to levels of integration in either area.

Photo No. 24: Social Space - an example of the degenerating environment in Clairwood (perpetuted throughout the area in varying degrees)

❑ *Grain and Land Use Mix:*

Neither area exhibits a fine grain of activity. The Clairwood study area, however, is closer to achieving a fine-grained environment than Umgeni Road. This is because of the levels of mixing within the residential area as well as the distribution of activities immediately on the spine: there is a fair degree of mixing between retail, service and residential activity along the spine itself. Behind the spine the activities once again form a coarse urban form as activities occur in groups: light manufacturing by Maharaj Road, motor-retail and services along Bacus Road, etceteras. Grain is definitely linked to levels of integration as a mix of activities generates a wide variety of people coming to an area for different purposes.

6.2 Functional Integration

Refer to preceeding Plans No. 13 and 15.

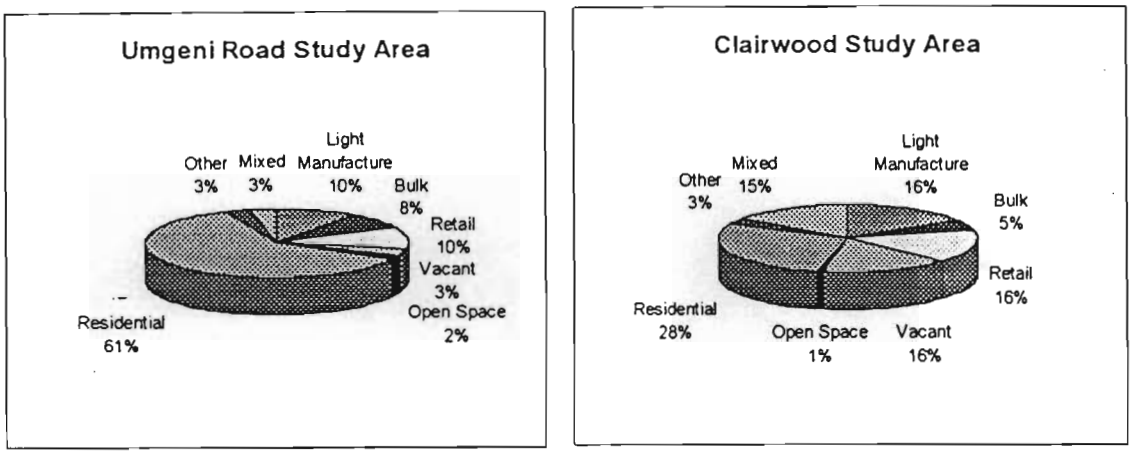
Levels of functional integration vary considerably between study areas. Umgeni Road does not exhibit much in the way of integration between land uses while Clairwood exhibits high levels of interaction. This has been attributed to the nature of

the activities within the areas as well as to the factors which led to their spatial positioning there. The spatial implications have been discussed above.

❑ *Diversity*

The figures below are based on Table 1 and Table 9 above and indicate the distribution of land uses within the study areas.

Figure 13: Land Uses within the Study Areas as a Whole

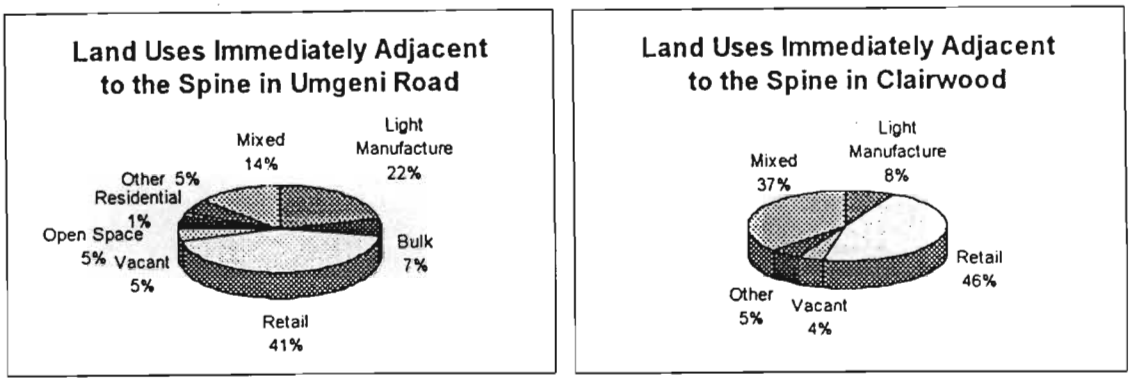


Economic land uses make up 28% of the total of the Umgeni Road study area and 37% of Clairwood. The residential uses are 61% and 28% respectively. It is significant that Clairwood has a lower residential portion as 13% is mixed use and 20% of the study area is vacant. This is a high number of vacant lots which are not being utilised. The development of this potential (which is expected with the 'redevelopment' of Clairwood) will have a significant influence on the nature of the area and for integration with the spine.

The type of activities which exist along the spine constitute what could be called the most important influence on levels of integration. This is because it is these activities which attract people to an area - certain spatial barriers can be overcome if there is a strong enough pull. A wide range of activities within an accessible and convenient spatial framework will generate interaction and therefore integration. Diversity is therefore essential.

The land uses immediately adjacent to the spine in both study areas are indicated in the graphs below:

Figure 14: Land Uses in the Study Areas - along the spine



In Umgeni Road, 41% of the activities are commerce-based activities, 22% light industrial, 7% offices / bulk activities and 14% are mixed uses. This could be argued to be a fair amount of mixing. The problem is, however, that the commerce-based activities are not geared towards stimulating interactions with local residents. As mentioned above, the activities are not 'people-oriented' and those few which are serve the workers in the area and the passing trade rather than the residents of the area.

Clairwood has more light industrial than Clairwood and it has a bulk / office component which Clairwood has not. The proportions of retail in both areas are quite similar. In Umgeni Road the uses are not people-oriented and do not generate significant levels of interaction. The retail activities in Clairwood, however, are of a 'people-oriented' type and do encourage interactions with the local residents (as well as passing trade and workers in the area). The location of hotels, casinos and bars in a spine will draw residents to the spine during the quieter evening times. This increases safety for residents along the spine. Integration is therefore strongly linked to the nature of activities. There are various influences on this.

Land use zoning has an important impact on the nature of activities. See Appendix 2 for zoning descriptions. Umgeni Road was zoned General Business 2 while the South Coast Road was zoned General Shopping. These zones enable different activities to locate. The General Business zone allows for business and light industrial uses but not shopping while the General Shopping zone allows for both shopping and business uses as well as for residential uses. This has obviously had a major influence on the location of activities along the spines.

The socio-economic characteristics in an area are important despite the metropolitan significance of spines and Activity Corridors. A strong mix and density of socio-economic groups will lead to the creation of diverse and vibrant thresholds suitable to support a fair mix of activities and land uses.

In Umgeni Road most of the retail shopping of local residents is done at the local shopping centres and stores on Windermere Road. This is an example of how the nature of activities and land uses influences how they are used.

❑ *Performance of Activities*

Multi-functionality in diverse environments tends to have a reinforcing effect. Activities impact on each other. The example used above of the location of hotels and casino's along the spine in Umgeni Road, as well as specialised food retail outlets will bring people into this area. Not only will thresholds overlap but the presence of people within the area after hours will positively impact on the residents - there will be increased surveillance and so safety is increased.

Another example of multi-functional environments is illustrated by the reinforcing effects of various activities during the evenings in Clairwood. The occurrence of night shopping in the area (initiated by Transkeian clientele) contributes activity to the area which encourages safety. It also reinforces the presence of the hotels, casinos, food outlets (including a restaurant) and bars in the area which would benefit from the increased trade.

Negative externalities are also an important element. In Clairwood the location of distribution depots and large industrial uses within the residential area generates negative influences on the residential land uses. Economic activities of this nature are noisy and generate heavy traffic. This is undesirable within a residential area. These activities should locate closer to the spine. The nature of activities along Umgeni Road would not facilitate a mixing with residential land uses because they do not generate sufficient interactions at varying times - offices close in the afternoon and so the area is empty of people. If there was more of a mix of 'people-oriented' activities and activities which generate 'people-traffic' over a range of time then the residential component would fit in well. It would be safe and they could interact with the other land uses. These relationships are extremely interdependent.

Functional integration all boils down to the complex inter-relationships which exist between different land uses and functions. Separating these relationships would be simplifying them. Integration is dependant on complex interactions between density, population and the nature of activities.

6.3 Social Integration

As far as social integration is concerned - none of the areas displayed a particularly varied mix of socio-economic profiles. Both areas had a 10% portion of Black residents, but Umgeni Road was predominantly White (84%) and Clairwood predominantly Indian (81%).

The main difference between these two areas is that the Clairwood community are very closely knit. Not only do they support each other (economically by buying at the local retail stores and using local services) but there are many links between the different households who have been there for many years. The interactions generated make the area active as well as safe. This is considered an important component in the generation of integration.

The lack of socio-economic mixing in Umgeni Road seems to highlight the way in which the 'higher-income' areas work well only for those people who can afford it. The minority groups in these areas are disadvantaged as the structure of the environment is geared towards separation of land uses. The lack of diversity prevents a range of goods, services and facilities being available. The need for people-oriented activities are indicated by the high levels of activity at the Windermere Road economic nodes. If these economic activities were located along a spine, higher levels of service would be enjoyed by the resident population as activities made use of the thresholds provided by the spine.

As has been mentioned, the orientation of urban environments to people is important. Given that the majority of people in South Africa do not own motor vehicles and are within the lower-income groups it would seem logical that an integrated environment is desirable.

CHAPTER 7 IMPLICATIONS AND RECOMMENDATIONS

7.1 Introduction

The theory of integration as developed in Chapter 4 above has now been used as a tool for analysing the case study areas. The results of this have been discussed in Chapters 5 and 6. The various conclusions drawn have implications - for integration as a dynamic of urban areas, as well as for the theory of integration.

What the study areas have shown clearly is that one or two of the issues alone cannot work for or against the spine. It is the interaction of all of these elements which influences the nature of the urban environment. In Clairwood, for example, the Southern Freeway provides a major spatial barrier and according to the 'rule books' should prevent any integration between the spine and the residential area. However, given the nature of the functional elements, integration is promoted despite the spatial barriers. Umgeni Road study area has a much more facilitative (although not ideal) spatial structure and yet does not have the functional elements necessary to promote any significant levels of integration.

Planners therefore cannot focus on issues separately. They cannot isolate any one element from the whole. So planning has to learn how to be holistic. It has to look at the dynamics as a set of inter-related and inter-dependent factors. Planners must not try and maintain a tight control over these activities, but rather recognise what is a desirable urban form and provide guiding principles for development. Planners can help create the spatial form which promotes choice and variety.

7.2 Spatial Integration

7.2.1 Implications

Integration between residential land uses and other activities needs to be a matter of choice - but it has to be an option. Spatial structure can play an important role in creating environments which facilitate a wide range of choices for all urban dwellers. The Activity Corridor concept provides a structure which would seem to promote many of the qualities which are needed by urban areas today. This structure hinges

on some important elements which can facilitate opportunities for integration and therefore for choices to be made.

❑ *Orientation*

Orientation, as described earlier, is an important element as it serves to reinforce the structure of the spine. The orientation of a mix of diverse and complementary land uses, as well as the orientation of higher density / intensity uses towards the spine, will ensure that a spatial ordering principle has been set up. The orientation of activities provides a structure to guide and influence future development of the area.

As has been noted in the study areas, the nature of land uses along the spine is significant. A strong orientation of light industrial uses towards a spine will tend to encourage further uses of that nature. On the other hand, if a diverse mix of land uses has begun to establish then this is likely to encourage the further orientation of like (and therefore mixed) uses to the spine. This highlights the importance of land uses being free to locate where they wish as this will cause mixing to occur. If there is a strong mix of land uses, then the orientation provided by the spine will serve to reinforce this.

The chief promoters of orientation are a strong hierarchy and clarity of structure (they each influence the other). The tools of these are density, structure and intensive activities including public transportation. This, once again, highlights links and inter-relationships - there is a link here with social considerations. A strong mix of socio-economic groups would ensure that an Activity Corridor structure would benefit all groups. The structure (that is, the orientation of activity around a spine) provides choices about levels of intensity and levels of service required. This then enables integration but allows residents to decide what level of integration suits them. Orientation facilitates choice.

❑ *Clarity of Structure*

Orientation is produced by and promotes clarity of structure. The degree to which the spine is a clear and definite dominant focus for activities and land uses is influenced by the degree to which this structure is legible. If it is clearly apparent that the spine is a focus, then this will promote appropriate development and clarity of the urban

structure. With a clear structure the districts and movement channels will be easily identified and therefore future development will reinforce it.

- *Nature of Connecting Elements*

The facilitation of movement along specific channels is a goal of paths. In South Africa paths are perhaps the most important of the connecting elements. The study areas did not exhibit any significant public places / squares and parks. Given the densities and structure of South African cities at present, these are not considered important. In higher density areas they will assume more importance as open spaces and the public realm in general create patterns and ordering elements amongst a more dense and solid built environment.

As far as movement channels are concerned, hierarchy is an important element as well as clarity and convenience. The spine needs to be designed in such a way as to further its goals. It must be a dominant through route for traffic. Interceptor routes must encourage stop-start movement along the spine (and therefore opportunities).

The direction of movement must be oriented to the spine. This will facilitate and encourage activities to direct towards the main route and not to dissipate in the surrounding area as in Umgeni Road. Pedestrian walkways are an important component here as pedestrian traffic is what reinforces the activities and the land use mixes - this is apparent in the Clairwood situation. People are the basic building block of this entire urban structure.

- *Pedestrian Movement and Scale*

The environment has to be scaled to the human. Humans are, after all, the primary users of urban environments and so their needs should be met - not the needs of motor vehicles and not the needs of planners - but the needs of the people who use these environments.

If pedestrian movement is not facilitated, then how convenient is that 'convenient mix' of land uses going to be? Design should create pedestrian-friendly environments with sufficiently wide pavements, benches, public spaces, etceteras. Channels should be safe and busy.

The orientation of facilities towards the spine has shown to be an important contributor to integration (see Clairwood). This highlights the important link with functional integration between residents and land use mixing. The orientation of goods, services and activities onto the spine, as opposed to internal arrangements within the shopping centre, would create higher levels of convenience for a wider range of people in South Africa.

Within areas which display this vibrancy and these dynamics, pedestrian traffic will be encouraged.

- *Hierarchy*

Hierarchy has been shown to be an important consideration, particularly by the Umgeni Road study area. If there is not a clear hierarchy of routes then the activity will dissipate and the advantages of a conglomeration of mixed activities within a corridor will be lost. The spine has to be a major route. This can be facilitated on a metropolitan scale by ensuring that it has a beginning and an end. That is, there must be important activities or nodes at either end of the route.

The route must be a significant carrier of traffic in order to make the route attractive for intensive activities. Public transportation is an important component of this. The status of the spine as a dominant route will help to structure the road hierarchy, so that everything leads to the spine. A modified grid pattern would seem to be suitable, but it needs to have a clear hierarchy. The residential layout in Clairwood did not have a clear hierarchy. The routes must be easily identifiable in terms of direction and order of importance. Collectors and distributors must clearly direct traffic to and from the spine and must be distinct from the local access roads. Design of the streets must facilitate this hierarchy so as to focus movement towards the spine. This would also prevent dissipation of movement, and therefore thresholds, away from the spine.

- *Accessibility*

Accessibility is one of the elements which is strongly interdependent on spatial structure. This also has marked functional overtones. Accessibility is promoted by the spatial location of intensive activities along the spine.

Elements of clarity of structure, orientation and hierarchy all facilitate or mitigate accessibility. For example - if the intensive activities and facilities are logically oriented towards the spine with a clear hierarchy of movement channels, densities and intensity of use, then those activities become more accessible to a wide range of people.

The layout and structure of this specific urban form will determine to a large extent the ease with which the residents can access the spine and related activities. A modified grid layout with clear hierarchy will create strong movement channels to the spine.

Basically the concentration of goods, services and facilities within a specific spatial structure - that is, the spine of an Activity Corridor - will increase accessibility for urban dwellers in the surrounds.

- *Density*

The importance of the people from the metropolitan area in Clairwood being more important than the dwellers in terms of threshold, cannot be seen as an indication that density is not important at all. Umgeni Road has slightly higher densities and yet very poor integration. In Clairwood, the residents provided the initial thresholds which led to the creation of a varied, mix-use environment along the spine. If the resident population does not exist, then the necessary thresholds cannot be created. This is because the metropolitan thresholds cannot be tapped until activity has been established which will demand attention and initiate interaction. The problem of densities does not stop here though. In Umgeni Road, for example, a relatively sufficient threshold exists in terms of an adequate density of 42 people per hectare (with potential for densification) and their higher-income status. This, however, does not mean that the necessary conditions exist for the creation of a perfectly integrated and vibrant environment. The predominance of a group of like-people is a pitfall in Umgeni Road as the residents prefer to do their shopping at shopping centres, and access these mostly by car.

This highlights that density is not one of the most important factors for achieving integration but it is a necessary condition to allow for the establishment of appropriate

activities along the spine. The spatial distribution of densities has a role to play in the structuring of urban areas but this has not been demonstrated by the case studies.

7.2.2 Recommendations for Spatial Integration

There are certain themes which have arisen in the implications above. These themes relate to a number of issues / elements at a time and so highlight the inter-relationships between the issues. The main concern of the spatial implications is for the design of urban areas. Extroverted design of neighbourhoods towards a spine, linear development of economic activities along a spine and basically the design of urban environments to a human scale.

Traditional layout and design of neighbourhoods needs to revised according to the desired goals of urban development. Closed and segregated neighbourhoods do not create the conditions of urbanity which should be generated in urban environments. This study argues that the extroverted design of neighbourhoods onto a spine, in accordance with the Activity Corridor Concept is an appropriate goal for urban planning. This does not mean that the planners should create Activity Corridors wherever possible - context should play an important role. Rather, the study calls for the Activity Corridor Concept to guide the framework of development. When appropriate, design should locate facilities along important transport routes (spines) instead of in the centre of neighbourhood units.

The neighbourhoods should be planned so as to integrate them spatially with the spine. The residential components need to overlap with the spine. The extroversion of the neighbourhoods onto a spine will increase interactions between people of different groups and make for more interesting urban environments. Facilities can be shared if they are located on a spine. In South Africa there is a large proportion of the population without access to facilities. Given monetary constraints, this study would argue that the activity spine concept is an appropriate form of development.

One of the most important elements of re-orientation of intensive activities is the location of general retail and services. The introversion of 'people-oriented' activities into shopping centres does not facilitate the creation of diverse and vibrant environments. It also means that there is a spatial separation, generally beyond the

human scale, between residences and shops. This segregation of activities is suitable for those people who are highly mobile and who can afford to travel to local shopping centres. However, for those people who cannot afford private transport, utility is maximised when these activities are made accessible, within reasonable distance from the residence.

Linear strip development should no longer be considered outlawed by planners. Strip development has been considered undesirable by planners because of congestion caused by the intensity of development. Intensity is exactly what urban areas should be trying to achieve. Planners must recognise this and begin to look at how to facilitate the development of activity streets and spines. The concept of activity streets fits in well here as it ties in with the description of linear development.

The extroversion of 'shopping' and services would also be a design criteria for the facilitation of pedestrian activity. Linear development along a particular movement channel encourages pedestrian activity. High levels of pedestrian activity help to generate the vibrant environments which operate on a human scale. The design of environments on a human scale has to be a new focus for planners.

As people are the primary users, urban environments have to be scaled to the individuals - not to the cars but to the people who utilise the facilities and who engage in the activities. The first step in designing for a human scale must be to ensure that as wide a range of goods, services and facilities as possible is available within walking distance. This is not a new concept - and it is one the primary underpinnings of the Activity Corridor Theory. Given South Africa's high proportion of lower-income people and the dislocation of large numbers of people from the benefits of urban environments, the location of activities and facilities within walking distance should be an important goal.

Accessibility is necessary in order to provide adequate levels of service to urban dwellers. It should be one of the primary goals of the spatial structure of urban areas. This study identifies a vehicle for the maximisation of accessibility as the spatial location of intensive activities along a spine. A modified grid layout should be a tool for the creation of accessible environments. This layout provides a clear structure around which activities can locate. This layout provides a range of opportunities as

different conditions are created (intersections, mid-block, different size blocks, distance from central spine, etceteras).

An essential element to facilitate linkages between residents and activities along a spine is the establishment of a clear hierarchy. The layout described above is argued to be the most appropriate for the creation of a strong hierarchy which emphasises the dominance of the spine. This is a necessary tool which planners can use to encourage the development of 'spinal' concentrations of activity. The dominance of the spine needs to be reinforced by the connecting elements as well as by the distribution of densities. The natural gravitation of intensive activities towards the dominant route, will also encourage higher residential densities - as opportunities are created for mixed use developments.

7.3 Functional Integration

7.3.1 Implications

The regulated separation of land uses is perhaps the most destructive force working against the creation of positive and complex environments which provide opportunities for all urban dwellers. At this stage it is not necessary to repeat the advantages of land use mixing. Suffice it to say that if conditions of urbanity are to be created it is a very necessary element of urban form. In South Africa, in particular, mixed uses are desirable in order to serve the majority of people with the maximum of convenience.

Urban environments contain a diversity of uses which range from general and specialist retail, to services, to entertainment and culture. The spine should contain those activities which are most intensively used. For example, these would include retail stores, food outlets, specialist services, entertainment facilities and high density residential units - this includes hotels.. Spines must also be a focus for public transportation. This will not only provide accessibility for the residents to the metropolitan area as a whole, but also reinforce the activities along the spine, increase thresholds, as well as encourage residents onto the spine to make use of the facilities.

Offices and uses which do not require intense human activity can locate behind the spine and amongst the high density residential uses. Without strong residential backing (and related uses), the vibrancy and convenience cannot be created. Residents provide activity and thresholds for different land uses. In South Africa the location of activities and facilities within the closest possible range is desirable for a high proportion of the population who have been denied the benefits of urban environments.

This links in with socio-economic mixing. Those people who cannot afford long distance commuting to goods and services can locate closest to the spine. Those people who prefer to remain dependent on the motor-car can locate in the lower densities further away from the spine. So long as the bulk of facilities and activities are located within the corridor and create a sufficient mix of compatible uses, they will generate vibrant urban areas. South Africa urban policy makers need to seriously review their attitudes on land use controls and land use mixing as a whole.

- *Land-Use Compatibility*

Possibly the most important lesson learnt here is that there must be a concentration of the majority of the economic activities towards the spine. A choice must be created as to what degree of intensity and land use mixing residents wish to be part of. The mixing of bulk and motor- and traffic-related uses within residential areas is not desirable. The location of these closer to major access points, the spine for example, would be preferable. The desired structure would probably be able to develop if land uses were not so rigidly separated by zoning controls and more emphasis was placed on compatible mixing and diversity. One of the primary components of land use mixing must be the increased mix of residential and economic activities, not only for reasons of thresholds but as this is how integration between areas is generated. The residential activities add vitality and life to otherwise stagnant areas of economic activities.

7.3.2 Recommendations for Functional Integration

During the analysis of both theory and case studies, a central theme remained - that of mixed-use development. Diversity has already been given as an essential goal for urban development. The primary tool for this diversity is mixed use development of

compatible land uses. Over and over again the restrictive nature of zoning controls has been indicated. The creation of monofunctional and sterile environments which minimum levels of convenience and opportunities, has resulted from planning's concentration on separating land uses.

Diversity, being such an important ingredient for integration, needs to be generated and facilitated as much as possible. One of the main blockages to the creation of mixed use environments is the regulation of use zones. Land uses must not be constrained but left to locate where the best opportunities are. This is generally determined to a large extent by the location of thresholds. Given an Activity Corridor structure, an appropriate spatial ordering principle is provided which will allow for a wide range of opportunities. If these land uses are then allowed to respond to the specificities of place, then diversity should be created - each land use has different needs and so a complex network is created.

The location of land uses in a concentration around a spine increases levels of performance for all. The mixing of thresholds and the boosting of activity benefits all uses. For example, the location of a bank next to a grocery store will have the effect of increasing thresholds for both. The people who come to use the bank will find it convenient to do their grocery shopping at the same time.

This impact of different land uses on each other's performance is not always positive. Land use compatibility is an important consideration. There are vastly differing opinions on which land uses are compatible and which are not. Traditionally, planning has generally called for the separation of residential and economic land uses, with the exception of the Special Shopping zone which allows for residential flats and hotels. Dewar & Uytenbogaardt (1979) call for a strong mix between economic and residential land uses. This highlights the benefits of an Activity Corridor - choice is created as people can choose their level of functional integration with the activities on the spine. The structure of densities - being higher closer to the spine - protects the lower density residential areas behind the intense activities. People can then decide for themselves what levels of activity they wish to be party to. This will of course be influenced by market forces, but this issue is beyond the scope of the study.

Land-use complementarity may provide a suitable basis for land use controls. This would not be prohibitive but merely serve to 'protect' the general amenity of the urban environment. For example, certain measures of undesirable externalities could be established for different uses. There could be a noise level limit and the retention of a few development controls (height, coverage, etceteras) which would be adequate to enable uses relative freedom of location while still maintaining some control over the built form.

The City Council's current attitude is not a constructive one. In the past, zoning controls required special consent applications to change to different uses and even the uses to which one could apply for special consent were restrictive. Recently, Durban City Council have adopted a 'facilitative' approach. There is no need to apply for rezoning or special consent. The Council will only close a business or activity if there is a complaint from the neighbours. If negative externalities occur, then there is an enquiry and action taken. This can be quite a costly business as the activity incurs certain costs in setting up and locating at a specific site. If the neighbouring uses complain, then those costs are wasted and it is costly to move once again. This is a waste of resources and could inhibit businesses because of the costs involved. People are not always aware of their rights and so could end up doing nothing about an adjacent use which negatively affects their property. The zoning regulations must be reviewed with a view towards being more constructive and realistic in generating diverse and positive environments.

Performance zoning is a possible way of keeping some control on potentially conflicting land uses without being too restrictive. Performance is based on the generation of externalities by different land uses. The externalities are assessed in terms of specific pre-defined measures. Criteria for measuring 'compatibility' between land uses would include noise levels, visual blight and environmental considerations for example. Performance zoning would then allow practically any use to locate within the zones on the condition that they maintain the standards set by the performance zoning.

7.4 Social Integration

7.4.1 Implications

❑ *Socio-Economic Profile*

The desirability for a socio-economic mix has been discussed earlier. The residential areas in the case studies did not exhibit a varied mix of race or income. These are considered to be factors which prevent the development of a truly varied / dynamic environment.

Another blockage to achieving diverse environments is the socio-economic profile South African cities. The separation of groups according to race and income has killed any potential for wide-ranging thresholds. A strong socio-economic mix would generally lead to a position where lower income groups would locate closer to the spine. The public transportation provided by the spine and the corridor in general facilitates these people and increases levels of accessibility. The mixing of socio-economic groups will enable the poorer people to enjoy wider benefits. This is because thresholds will be higher than they alone could generate due to the proximity of higher-income groups.

The Umgeni Road area is an example of a predominantly white area which contains people with a predominantly white lifestyle. That is the people carry out their daily activities in spatially dislocated places. They may go to school within their residential area, but places of work, sport and social recreation are far apart and require motorised transport to get from one to another. If one looks at areas which contain a mix of race and income groups, in South Africa and world-wide, they display far more active and positive environments. Hillbrow in Johannesburg has been cited as an example of a diverse environment.

❑ *Safety and Security*

Safety is closely linked with level of interactions and socio-economic characteristics. Levels of interactions are increased if there is a wide variety of activities and facilities within a specific area. These will draw people into the area for different reasons at different times. The local residents in an area will get to know one another because the public realm becomes just that - a public meeting place and locale for interactions

and activities. Once familiarity is generated a certain level of safety is assumed. Clairwood was a good example of this. If one looks at crime in the surrounding areas it is at much higher levels than that which occurs within the study area. This is undoubtedly because of the strong community bonds which exist amongst residents.

There is a strong ethnic overtone here. White communities do not interact to the same extent as their Black and Indian compatriots. This could have an important influence on the nature of socio-economic mixing which has been recommended for activity corridors. A mixing of social groups (by race, income and household profile) could create a variety of conditions which could help generate vibrant communities. This, coupled with a multitude of activities along a corridor, could stimulate mixing and interactions thus facilitating wholehearted integration.

7.4.2 Recommendations for Social Integration

Once again the emphasis is on mixing. The urban environment described in this study as optimal is the antithesis of the average South African city. With its emphasis on separation of income and race groups in the past, policy must now look at preventing the forced separation of groups in the future. This can be furthered by the creation of a variety of conditions to which a variety of people can respond. As mentioned earlier, the structure of the spine is such that different opportunities are created within the corridor. This could be an important tool in encouraging the mixing of people. It would benefit the lower income groups because of the increase in thresholds created by the presence of the higher-income residents, assuming that activities exist along the spine which would attract the custom of a variety of people.

If residential areas are integrated with a rich mix of activities along the spine, then interactions will be encouraged. The safety and security of the environment will be improved because of the increased surveillance. Planners can help generate these interactions by designing public spaces and connecting elements which have a primarily social function and which are, once again, designed to the human scale.

7.5 Overall Recommendations

Integration between residents and the spinal activities has been used as a tool to indicate the benefits of one of the structural components of the Activity Corridor Concept. Integration has to become an integral part of a planners vocabulary if dynamic urban environments are to be created which benefit a wide range of people.

The most important recommendation of this report is that of the need for a framework to guide development; one that recognises the needs of urban dwellers and the type of urban environments that need to be created. Planners need to have an holistic framework which has thoroughly researched the elements of spatial structure and human need. At the moment Activity Corridors are becoming popular as a concept. The problem is that there is minimal understanding of the elements within this concept. Planners must look at what exists in reality and identify what their role is in helping to create desirable urban environments.

Integration is considered to be one of the most important elements of urban structure because of the conditions it generates and the chance it gives to address the structural deficiencies of the past. Planners must take cognisance of this and incorporate integration as a goal of urban development.

A theory on integration was developed which, for the first time, highlighted different elements underlying the dynamics of this particular urban relationship. The study areas, then, provided varied urban environments each of which contributed to the understanding of integration as a goal of urban form. Given the need for planning to consider urban dwellers and their needs integration is an attempt to begin this process. Integration is a concept which is rooted in the need for people to enjoy conditions of urbanity. The Activity Corridor Theoy that people come to cities in order to enjoy the benefits generated by concentrations of people, activities and facilities. One of the most important conditions of urbanity is the integration of these people with the activities they wish to be involved with. This study has highlighted the importance of integration and its relevance as a primary goal for urban theory and practice.

The importance of integrative mechanisms in reducing the separation of everyday activities has been highlighted, within the context of the fragmented structure of South African cities. The dynamics of integration have been identified which will contribute to the understanding of the Activity Corridor Theory and its inter-relationships.

A recurrent theme throughout the study has been the importance for the generation of vibrant and diverse environments with a rich mix of land use activities. This forms the crux of developing integrated environments

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APPENDIX 1: LAND USE CATEGORIES

Category	*Description of what land uses are included*
Commerce-based Activities	• Commercial and retail (shops, tea rooms, take aways; furniture/clothing s • Service activities (caters for day-to-day needs; shoe repairs, surgeries, ba • Commercial Shopping Centres and • Market / Informal trading
'Offices'	• General offices (consultancies, professional offices, headquarters for firm • Wholesale / distribution (wholesalers of bulk goods) • Warehousing (storage of bulk goods)
Light Industrial (Manufacturing)	• Light Manufacturing (vehicle repairs, panel beaters, clothing manufacture engineering goods and components)
Mixed Uses	• Retail/commercial with residential • Offices and residential • Retail/offices/light industry with residential • Other mixed use without residential
Low Density Residential	• Detached dwelling units
Medium Density Residential	• Attached housing (duplexes, simplexes, maisonettes, etc.) • 2 - 3 storey flats / walk-ups
High Density Residential	• Flats 4 storeys and above, hostels, hotels and holiday flats
Facilities (individually identified)	• Educational • Religious • Institutional / medical • Cultural / entertainment • Post offices • Police Stations • Cemeteries
Open Space	• Public open space • Active open space
Transport Related Uses	• Petrol filling stations • Bus ranks, taxi ranks and • Provision for parking
Others (identified but not considered significant)	• Infrastructure (sites used for water reservoirs, electrical sub-stations, etc.) • Heavy / extractive industry • Government / municipal (government offices, military sites, depots, etc.) • Vacant (sites or buildings)

APPENDIX 2: ZONING CONTROLS AND REGULATION

Some of the Zoning Regulations for Both Study Areas

Use Zone	*Purposes for which land may be used or for which buildings may be erected and used*	*Purposes for which land may be used or for which buildings may be erected and used only with the special consent of the council*	*Purposes for which land may not be used or for which buildings may not be erected and used*
Special Residential 1	Dewlling House, Ancillary Unit	Agriculture, Place of Instruction, Place of Worship, Social Hall, Creche, Special Buildings or use, offices in terms of Clause 7, Institution, any other use authorised in terms of Clause 6 bis.	Other uses not under Columns 2 and 3.
Maisonette	Dwelling House, Ancillary Unit when ancillary to a Dwelling House, Maisonettes	Agriculture, Place of Instruction, Place of Worship, Social Hall, Creche, Special Building or use, offices in terms of Clause 7, Institution, any other use authorised	Other uses not under Columns 2 and 3.

		in terms of Clause 6 bis.	
General Residential 1	Dwelling House, Ancillary Unit when ancillary to a Dwelling House, Maisonettes, Residential Building, Institution	Agriculture, Licensed Hotel, Parking Garage, Place of Instruction, Place of Worship, Social Hall, Creche, Special Building or use, offices in terms of Clause 7, any other use authorised in terms of Clause 6 bis.	Other uses not under Columns 2 and 3.

Use Zone	*Purposes for which land may be used or for which buildings may be erected and used*	*Purposes for which land may be used or for which buildings may be erected and used only with the special consent of the council*	*Purposes for which land may not be used or for which buildings may not be erected and used*
General Residential 2	Dwelling House, Ancillary Unit when ancillary to a Dwelling House, Institution, Residential Building.	Agriculture, Licensed Hotel, Parking Garage, Place of Instruction, Place of Worship, Social Hall, Creche, Special Building or use, offices in terms of Clause 7, any other use authorised in terms of Clause 6 bis.	Other uses not under Columns 2 and 3.
Place of Worship	Cross-Hatched Red with symbol "W"	Dwelling House when ancillary to a Place of Worship, Place of Worship, Creche when ancillary to a Place of Worship.	A Special Building which is ancillary to a Place of Worship or any use so ancillary, any other use authorised in terms of Clause 6 bis.
Special Shopping	Offices, Residential Building, Restaurants, Shops (excluding Shops of the kind referred to in Column 4).	Dry-cleaning or Dyeing Establishment (but excluding a Receiving Depot), Laundry, Parking Garage, Petrol Service Station, Place of Amusement, Place of Instruction, Place of	Other uses not under Columns 2 and 3.

		Worship, Shop for sale of motor vehicles, Service Industry, Social Hall, Totalisator Depot, Creche, Special Building or use, any other use authorised in terms of Clause 6 bis.	

Use Zone	*Purposes for which land may be used or for which buildings may be erected and used*	*Purposes for which land may be used or for which buildings may be erected and used only with the special consent of the council*	*Purposes for which land may not be used or for which buildings may not be erected and used*
General Shopping	Institution, Offices, Residential Building, Restaurants, Shops (excluding Shops of the kind referred to in Column 3).	Dry-Cleaning or Dyeing Extablishments (but excluding a Receiving Depot), Licensed Hotel, Laundry, Parking Garage, Petrol Service Station, Place of Amusement, Place of Instruction, Place of Worship, Shop for sale of motor vehicles, Service Industry, Social Hall, Totalisatior Depot, Creche, Special Building or use, any other use authorised in terms of Clause 6 bis.	Other uses not under Columns 2 and 3.
Light Industrial	Light Industrial, Service Industrial.	Institution, Offices, Parking Garage, Petrol Serfice Station, Shop in terms of Clause 6(31), Restaurant, Totalisator Depot, Special Building or	Other uses not under Columns 2 and 3.

		use, any other use authorised in terms of Clause 6 bis.	

Use Zone	*Purposes for which land may be used or for which buildings may be erected and used*	*Purposes for which land may be used or for which buildings may be erected and used only with the special consent of the council*	*Purposes for which land may not be used or for which buildings may not be erected and used*
General Industrial	Industrial purposes other than Extractive of Noxious.	Institution, Offices, Parking Garage, Petrol Service Station, Shop in terms of Clause 6(31), Restaurant, Totalisator Depot, Special Building or use, any other use authorised in terms of Clause 6 bis.	Other uses not under Columns 2 and 3.
Noxious Industrial	Industrial purposes other than Extractive.	Institution, Offices, Parking Garage, Petrol Service Station, Restaurant, Shop in terms of Clause 6(31), Totalisator Depot, Special Building or use, any other use authorised in terms of Clause 6 bis.	Other uses not under Columns 2 and 3.

Use Zone	*Purposes for which land may be used or for which buildings may be erected and used*	*Purposes for which land may be used or for which buildings may be erected and used only with the special consent of the council*	*Purposes for which land may not be used or for which buildings may not be erected and used*
General Business 1	Business premises (exluding those referred to in Column 4), Dwelling Houses, Residential Building, Restaurant, Licensed Hotel, Place of Worship, Place of Assembly, Place of Amusement, Institution, Place of Instruction, Creche, Industrial Building (excluding those referred to in Columns 3 and 4), Social Hall, Totalisator Depot.	Parking Garage except as is provided in Sub-Clause 6(23), Petrol Service Station, Panel Beating, Spray Painting, other uses not under Columns 2 and 4, any other use authorised in terms of Clause 6 bis.	Noxious Industrial Building (excluding those referred to in Column 3).
General Business 2	Business premises (excluding those referred to in Column 3), Light Industrial Building (excluding those referred to in Columns 3 and 4).	Petrol Service Station, Totalisator Depot, Place of Instruction, Industrial Building, Panel Beating and Spray Painting, Special Building or use, other uses not under Columns 2 and	Dwellings, Maisonetter, Residential Buildings and Noxious Industry.

		4, any other use authorised in terms of Clause 6 bis.	

Development Controls on Certain Land Use Zones[11]:

Special Shopping

Plot Area Ratio:	N/A
Coverage:	50%
Maximum height:	2 stories
Building Line:	3m
Parking:	1/15m² for shops and offices
	flats 1 bay / dwelling unit
General:	flats permitted
	ground floor only for shopping

General Shopping

Plot Area Ratio:	1,5
Coverage:	50% for shops and offices
	20% for flats
Maximum height:	No limitation (determined by angles between buildings)
Building Line:	3m for shops
	7,5m for flats
Parking:	1/15m² for shops and offices
	flats 1 bay / dwelling unit
General:	flats permitted
	ground floor only for shopping

General Busin 2

Plot Area Ratic	1,5
Coverage:	N/A
Maximum heig	25m
Building Line:	Nil
Parking:	Industry 1 bay / 150m²
	Business 1 bay / 300m²
	Must provide loading and off-loading facilities
General:	No residential use

[11] Source: Planning Scheme, City of Durban

Light Industry

Plot Area Ratio:	N/A
Coverage:	N/A
Maximum height:	25m
Building Line:	Depends on nature of use
Parking:	1 bay per 150m²
	Must provide loading and off-loading facilities

APPENDIX 3: LIST OF PHOTOGRAPHS

UMGENI ROAD

PLAN NO. 3
LAND USE

- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- MIXED USES
- COMMERCE-BASED ACTIVITIES
- OFFICES / BULK ACTIVITIES
- LIGHT INDUSTRIAL
- EDUCATION
- RELIGIOUS
- TRANSPORT-RELATED USES
- OPEN SPACE
- MUNICIPAL
- INFRASTRUCTURE
- POST OFFICE
- VACANT

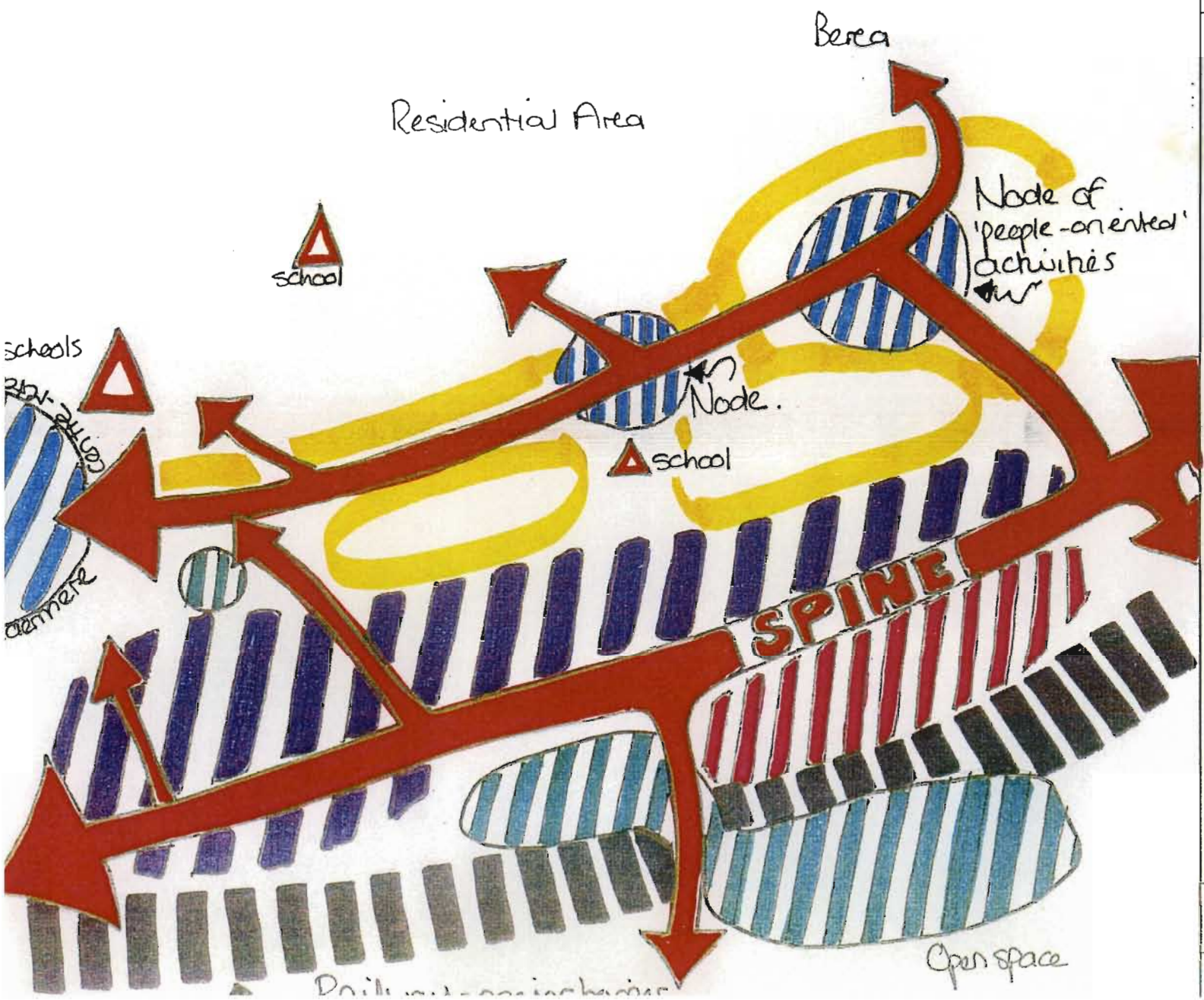
PREPARED BY: LISE C. LILLEBY

DATE: DECEMBER 1995

SCALE: 1 : 6 000

0 100 200 300 400 500m

UMGENI ROAD



PLAN NO. 4
VISUAL ANALYSIS

- ○ NODE - MOSTLY RETAIL
- ○ MOSTLY BUSINESS
- ○ MOSTLY LIGHT INDUSTRIAL
- ○ RECREATION
- □ EDGE - RAILWAY
- □ ROUTES

PREPARED BY.	LISE C. LILLEBY
DATE.	DECEMBER 1995
(SCALE.	1 : 6 000)

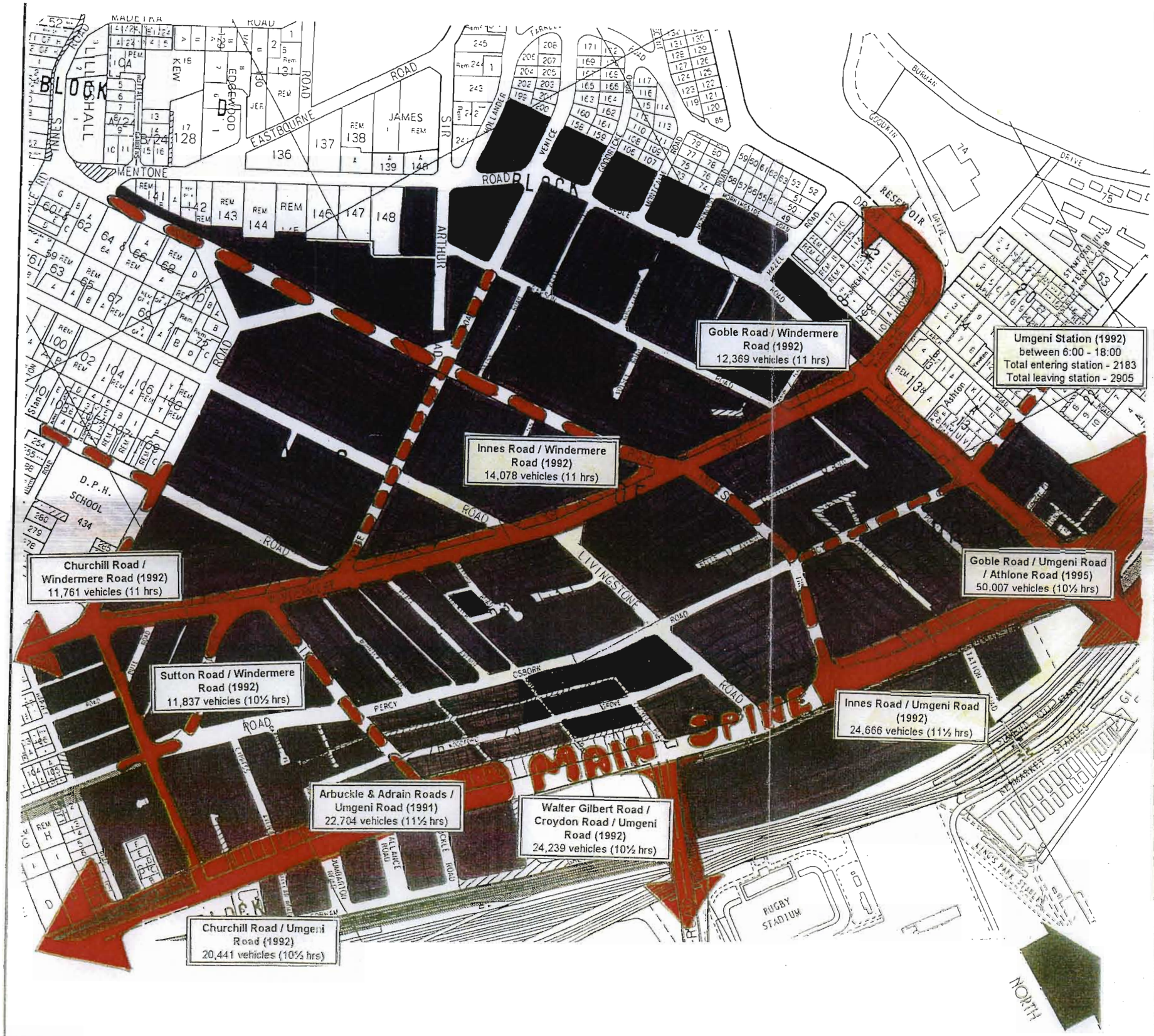
UMGENI ROAD

PLAN NO. 5
TRANSPORTATION

MAIN ROUTE

SECONDARY ROUTE

ROAD LAYOUT

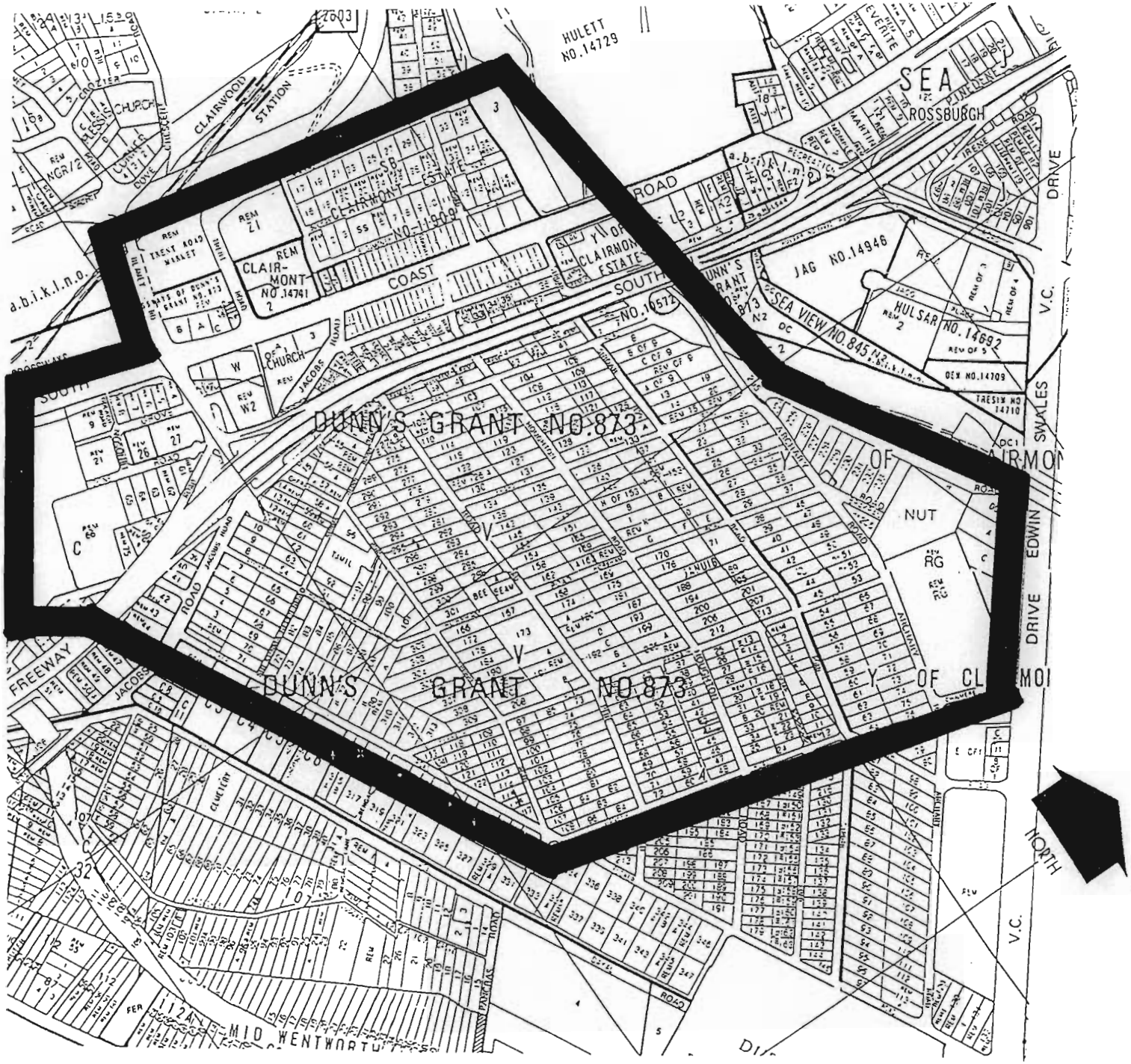


PREPARED BY: LISE C. LILLEBY

DATE: DECEMBER 1995

SCALE: 1 : 6 000

0 100 200 300 400 500m



CLAIRWOOD

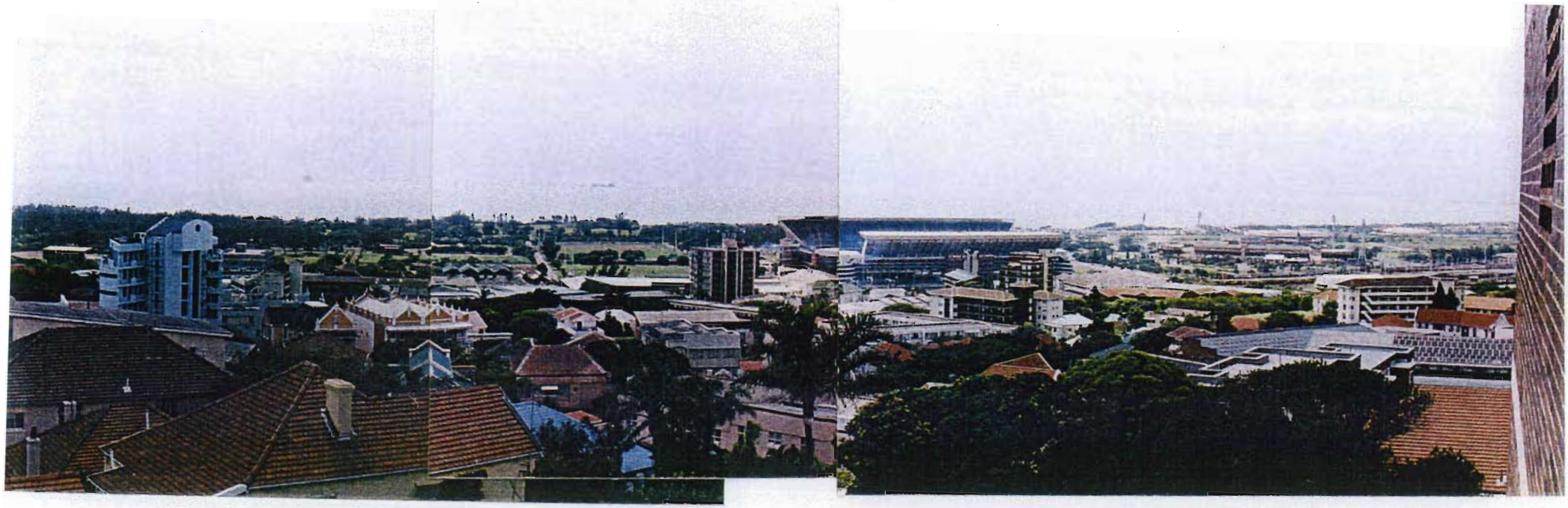
PLAN NO. 6
STUDY AREA

PREPARED BY.	LISE C. LILLEBY
DATE.	DECEMBER 1995
SCALE.	1 . 6 000


UMGENI ROAD
STUDY AREA
CLAIRWOOD
STUDY AREA
DURBAN
NATAL BAY
Springfield Flats
Country Club Beach
Battery Beach
North Beach
South Beach
West Street Groyne
Addington Hospital
Salisbury Island
Mission Beach
Anstey's Beach

PLAN NO. 1

Visual Analysis

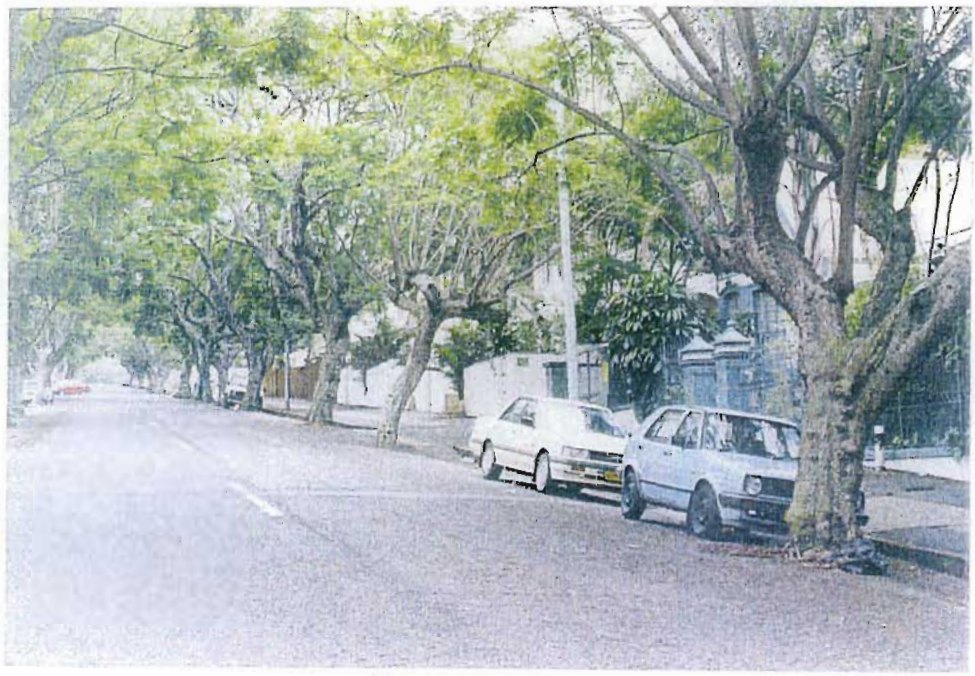


The situation of more expensive dwellings in the west of the area is explained by climbing the hill and looking back down over the study area.

UMGENI ROAD STUDY AREA.

The obscure location of high density dwelling units. Obscure as this is surrounded by single dwelling units with the exception of Winklemere Centre 200 metres away.

UMGENI ROAD.



A typical residential are in 'white' South Africa.

View down Dumbarton Road. Indicating the railways role as an impenetrable barrier.

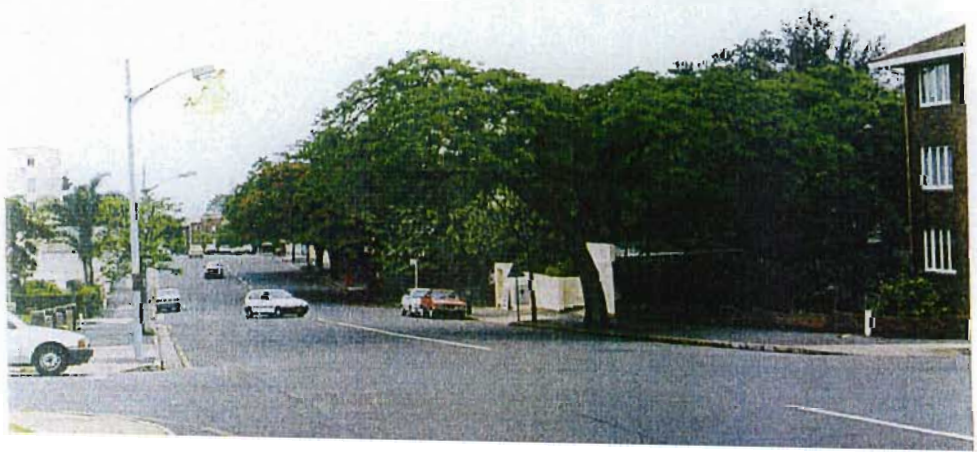
A view showing some of the activities along the spine.

Umgeni Road.

The spine is a dominant route for commuters buses and taxi

Three to four-storey walkups have been identified as opportunities for creating higher densities without sacrificing privacy completely.

The Anglican Church provides a positive landmark in the area.

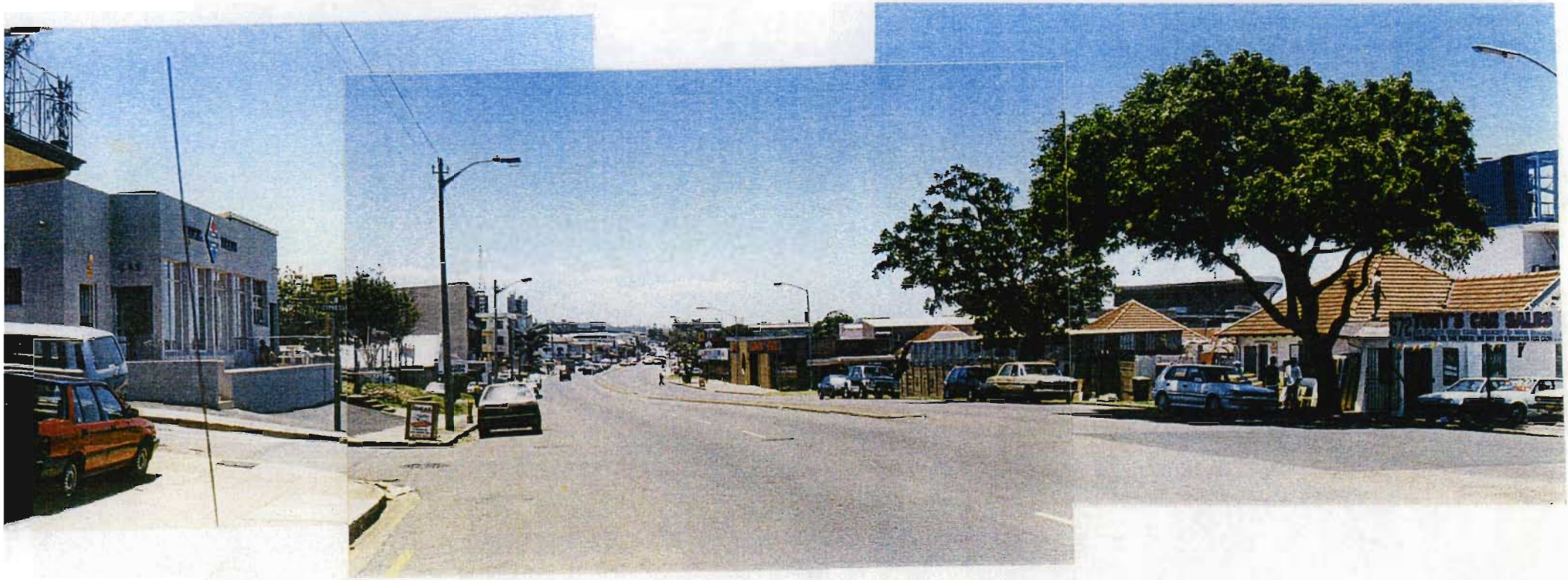


Innes Road is a major distributor to the Berea from Windermere.

Some examples of old and varied building stock

Umgeni River

Ungeri Road
a good example
of non-people
oriented activitie



The variety of buildings - in terms of type and age - provide a positive opportunity for the future development of the area.

UMGENI ROAD.

Looking at high density dwelling which face onto the spine - from behind.

Mixing between residential and economic activi is an integral part of the spines vibrancy

The lack of quality of urban space i apparent in H view down Bacus Road

Some vertica mixing of use along the spi Old building stock provid potential for redevelopme in the future

Various perspectives of Old South Coast Road.

- prevention of pedestrians crossing exce at specified points

- Intersections at every 50 - 75m in study area.

- High levels of use by vehicular a pedestrian traffic.

These pictures indicate the vitality of the residential area which is always busy.

The significant role of economic uses in generating traffic is apparent in the top photo.

Sirdar Road is an important focus for economic activities.

Clairwood contains an extremely diverse housing stock. The 'new' house above was not located far from old run-down dwellings and the squatter settlement.

View from the walkway down Pine on a Sunday. Even on the weekends there are high levels of activity in the residential are This contrasts directly with Urngeri Road.

View down Sastri Road from Pine Roa

Streets and road are in poor repair with the exception of those few identified for the redevelop-ment phase.

View up Howard Road towards the Freeway.

Informal market developed in a vacant lot in Pine Street. This is now a bus stop for buses from the Transkei. This would provide good opportunities for the squatters

There are many formal dwelling units in Clairwood which house informal units at the back of their properties.

A gathering of informal dwellers on a Sunday afternoon.