SYSTEMS APPROACH TO URBAN DESIGN PROCESSES AND METHODOLOGIES THROUGH THE AGENCY OF COMPUTER MODELLING

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This Thesis is dedicated to my Mother.

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I N D E X

PROLOGUE

Process in Urban Design forms an integral and important part of the understanding and the creation of opportunity and the provision of direction within any urban development. Process within Urban Design principles further allows for the synthesis of urban forces to be explored and examined, allowing for a symbiosis to be created between social/physiological, economical/financial, and political/policy components of the built environment.

This paper proposes, through the appraisal and identification of the processes within Urban Design, implementing a strategy incorporating urban computer modelling, and demonstrating how this methodology not only informs on a specific procedural approach, but is perceived as a tool that forms part of the research and theory of the body of Urban Design. This will encompass exploring the synthesis of Planning, Economics, and Architecture within the framework of a computer modelled program, and through this agent, evaluate in terms of Urban Design criteria and strategies.

The paper further wishes to discover and explore a SYSTEMS APPROACH TO URBAN DESIGN, encompassing a decision making process that from inception tackles the strategy and methodology of urban design - one which is flexible and cognitive of the possibilities and realm of influence in the market place. This exploration is thus essentially about PROCESS and SYNTHESIS within the framework of rational and systemic modelling, with an aim of creating an urban design process to maximize opportunity in the most efficient way. Thus urban design criteria are to play a salient part in the understanding and thinking behind the modelling format, which will also outline the importance of a multi-disciplinary approach to urban

design. Urban design processes and methodologies on a broad level are studied as to understand and provide measure to the relationship and integration with other procedures.

The following is a broad outline of a methodology that will be incorporated into the overall process :

1. Design Principles / Development criteria
   - the establishment of a process in which criteria can provide argument, understanding, knowledge and direction with regards to the effectiveness of land use and development in the urban realm.

2. Planning Policy.
   - examining planning controls in terms of parameters, opportunities, and constraints.
   - studying policy directives and town planning schemes.

3. Form Coagulation.
   - the establishment of overall massing possibilities as a result of controls and directives prescribed in 1. and the opportunities therein.
   - the provision of analysis to quantify and qualify percentage allocation of land use and lettable space.

4. Feasibility.
   - economic scenarios with respect to returns, residual land values, land improvement costs incorporating private and public interest.
   - contextual issues in terms of viability and feasibility.
   - levels of economic analysis;
     a. overall economic/financial analysis.
     b. precinct economic/financial analysis.
     c. site economic/financial analysis.
     d. building economic/financial analysis.

5. Thread Analysis.

- explore options, directives, controls, incentives, frameworks, development policies, overall urban design strategies, and structure and system performance.

6. Implementation and case studies.

- The process is to be examined against three disparate case study area;
  a. vacant parcel of land (SOUTHCREST EXT 3)
  b. suburban fringe (ROSEBANK/PARKWOOD)
  c. existing urban structure (KENSINGTON 'B' RANDBURG)

The process will incorporate the use of LOTUS 123(spreadsheets, graphs, bar charts), HARVARD GRAPHICS(analytical matrix, charts, graphics), as the tools to express the thinking behind the process.

CHAPTER 1

C H A P T E R O N E

u r b a n d e s i g n i n t h e r e a l m o f i n f l u e n c e

1.0 INTERVENTION AND MEANING

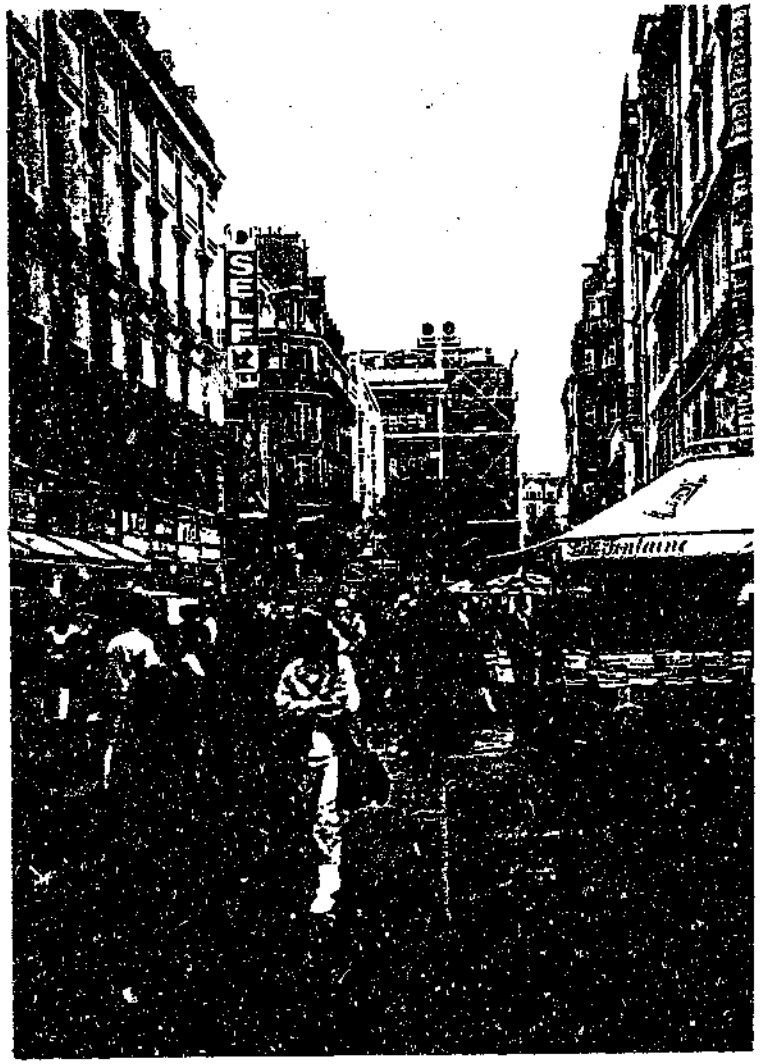
Urban design, as a discipline, although founded within the capitalistic structures of the western industrial cities, exists in a South African context within the tension and contradictions of First and Third world systems.

In a more specific context, its disposition and realm of intervention appears to exist somewhere between the boundaries of urban planning - the organization of the public realm, and architecture - the physical design of the private realm. The notion of synthesis and the cognisance of the provision for the residual component of urban environment has only recently been developed.

Pittas discriminates between architecture and urban design since the latter is most often concerned with the enabling qualitative environmental change while architecture is concerned with the authorship of artifacts .i.

Urban design is essentially absorbed within four interrelated characteristic;

1. involved within the dynamic relationship of states and not seen in end product terms.
2. operates within a adaptable and ephemeral framework.
3. establishes initial and strategic guidelines prior to the architectural implementation.
4. concerned not only with the architectonics of space, but also with the residual spaces and



relationships between architectural objects and the resultant public spaces that are created.

Pittas further detached planning from urban design as the concerns for the three dimensional quality of space is disregard in planning procedures.

Bartholomew defines urban design as 'the art of designing large parts of the built environment at a general level prior to the design of a particular building or other component in detail.2.

A more comprehensive definition is offered by the Urban design section of the American institute of Certified Planners (1976) : 'Urban design activities seek to develop the policy framework within which physical designs are created. It is that level of design which deals with the relationships between the major elements of the city fabric. It extends in both time and space in that its constituent parts are distributed in space and constructed at different times by different persons. In this sense urban design is concerned with the management of the physical development of the city. Management is difficult in that the client is multiple, the program indeterminate, control partial, and there is no certain state of completion. Its concern is with both the urban built... and the natural environment as impinged on by urban development'.3.

1.2 FUNCTION AND INFLUENCE

Urban design is influential in the interrelationships of capital production and strategies of planning. This is approached through the appraisal of the fixed financial resources that are available and examine the

infrastructural and design costs and benefits that exist and implement the optimum solution. The function can thus be defined as a match between management and the provision of resources, and embodied within an process and methodology that provides a pervasive platform to make finance more readily available.

It provides for public man nd the creation of positive urban spaces within corporate and private infrastructures on the one level and plays a role in the provision of housing and the resolution of the housing crisis on the other. Urban design is thus seen as an interactive relationship between building, the individual and society. The maximum articulation of form is seen as the means of rendering the public an active and participant consumer of the architectural product and the urban intervention.

Urban design can thus be influential through the creation of conditions of choice and the establishment of options, motivating for accessibility through more sensitive and meaningful intervention. The response should be facilitated by physical and non-physical systems of form and space - not to be thought of as geographical boundaries or a sum of particles, but as the materialisation of human activity patterns encompassing the physical, metaphysical and socio-cultural flow of energy events.

This requires a positive inter-disciplinary framework, not only between disciples relating to urban design, but also the external actors who influence or understand the course of urban design. It is here that urban design's role can be seen as being influential within the context of mediation, that of an agent or facilitator to the process within urban growth. Urban design strategies cannot be manifest out of the rigid ideologies and static

insular processes, but rather needs to ensure the process offers an experimental and spatial matrix within which opportunity and synthesis can be obtained.

The Urban Designer must have the skills to isolate prevailing patterns within the urban realm, and through a cognitive approach, identify, address, and provide recommendations pertinent to issues that would enhance those patterns. The designer must therefore have an impact in preventing unbalanced and polarized settlements, which can create social fragmentation and establish economic contradictions. The process also includes questioning contemporary structures and systems of the city and assess their relevance to the individual.

The Urban Designer must also value the ability to seize and create opportunities for positive intervention in the city, to have a 'thumb on the pulse' with respect to socio-political and economic dynamics. Thus the profession would be influential within the urban political system, which is crucial in determining both how economic resources are applied and how the built environment is shaped. "Urban design is not only concerned with the relationship of new development to existing city form, but also to the social, political, and economic demands and resources available". 4.

Urban design must be influential in terms of the decision making process which is forming the urban fabric, to have a pervasive concept of regenerating urban space for the public man, with economic constraints in mind. Urban design thus plays a role in ' healing the tissues' of the city, and providing urban spaces with a purpose.

Urban design is thus a creative challenge much greater than that which stems from a single building, and therefore a design strategy is needed which can express the innate of the urban spectrum. Design is discovery,

and in this context, the designer is responsible for discovering the maximum visual possibilities latent in a given situation. The role requires insight into the complex and dynamic characteristics of the urban realm. Urban design approach can be influential through a strategy that enables the implementation of an alternative process that provides access to participative design initiatives and directives that are dynamic and benevolent to the needs of the city.

1.3 TOWARDS A STRATEGY

There are two basic approaches in the modern practice of urban planning:

* the scientific approach - in the domain of spatial and urban planning, which is based on the empirical causality of development, applied to the organic nature of the city system, and
* urban design - that infers spatial design and functional composition with all other aspects of the city's structurality.

Although inspection from different viewpoints in determining the concept and meaning of individual urban components, both approaches essentially endeavour to achieve a balanced urban system. The basic difference lie in the chronological position and operational possibilities in the planning process, in the predisposition to control the time component of four-dimensional structures, the accessibility of interpretation, the level of imagination and communication.

While the scientific approach confers greater importance to exact indicators (economic, demographic, technological) in the development of an entity, valuating

them and designing them into the future, the urban design approach sets urban shape, architecture of the city and morphological characteristics of the city in general as its priority goal. The differences between the two approaches do not present an obstacle to their communication, and since they possess authentic qualities, and are a priori in certain domains of spatial organization, and are equally imperfect and incomplete, they do not exclude each other and are practiced in the planning process combined. 5.

The development of the coexistence of scientific processes and urban design methodologies form the central spine of enquiry in this paper, that hopefully would enrich the meaning and realm of influence of urban design and provide for improved concepts of progressive development.

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2. Bartholew, R., quoted in ibid., p. 11.
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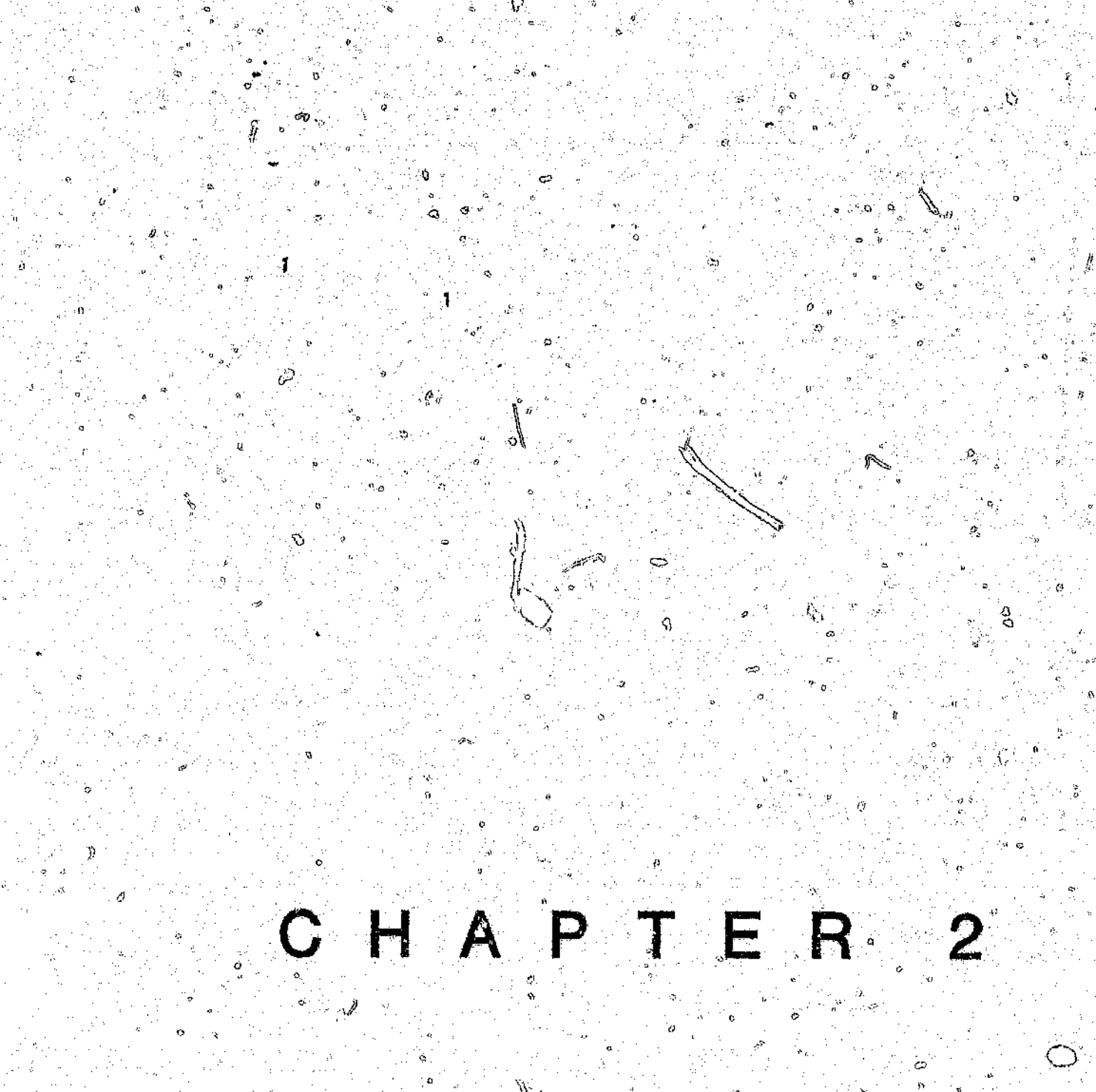


CHAPTER 2

C H A P T E R T W O

2.1 URBAN DESIGN AND THE INCEPTION OF A NEW THEORY
Towards an agency and tool for urban design

In the history of urbanism, architectural movements have been created as a response to either the advent of technology or due to the demise of public man. In the contemporary era, it has become evident that the problems of the present and the future cannot be solely perceived, or even solved by the capricious nature of intuition. There is a growing realization that all parts of the built environment must be interrelated, and that the notion a synthesis between the constitution of aesthetic structures and functional prerequisites must now see physical implementations. Attention has moved towards the formulation and implementation of design methods(design methodology and systemic process in design).

Current concerns of design and design theory have been born out of and guided by the developments in the mid sixties in the fields of applied mathematics and the computer sciences and their influences on industry and other disciplines.

This brought a new concern about the theory of design which resulted in a series of 'rational' models of design. The methodology of systems science was inherited into the thinking of design process through the formulation of these models that provides the ideas and principles of such methods establishing sequences of well defined activities. Concepts from operational research were borrowed and formulated goals of generation of optimum solutions in design.

The scientific method, as it is understood seeks an approach to problem solving through the strict laws of

logic, and proceeding in a straight line towards a predictable solution. The design problem is atomized into separate components, each of which is regarded as a separate problem to be solved.

Through this appraisal brought a new concern about methodology in which Rittel opinion '... aims at explicit, communicable, and plausible descriptions and rules of the what, why and how of an activity'. 1.

Alexander, Archer, and Jones explored and produced advanced models which represented a radical departure from the past. Their models view the design process as a step-by-step procedure in which analysis can be separated from synthesis, and procedures can be prescribed which will improve the product: the design solution.

Rittel and Alexander later offered moderately different models of the design process. Rittel views the design process as a process of argumentation, while Alexander sees it as the process of interaction between the source of knowledge and experience, and the decision maker (to be discussed in more detail later in the chapter).

The use of prescribed procedures failed to achieve optimum design solutions, but rather created an environment of expectation for the application of operational research techniques in design and suggested that the benefits from their use for designers was viable. These models raised the level of consciousness about the process of design through the definition of logical structures which represent the design process.

Criticism was levelled to the ability for "logic and innovation to readily co-exist" 2. in these systems.

Appraisal of these or any other systemic approaches should be cognizant of the potential of intrinsic processes of systems to be born out of the notions of synthesis. The models that are evidently based in this realm becomes available to the opportunity of the holistic approach to design, and thus the primary integration of both faculties as been of fundamental importance in the development of effective process and methodology in urban design.

2.2 MODELLING AND THE 'WICKED PROBLEM'
appraisal of initial models

Criticism from the earlier models also included the notions that design is not based on a strictly sequential process, and that design problems are wicked' and that a step by step linear procedure applied to them cannot in itself yield any solutions.

Rittel's expresses the problems of the earlier models of the design process through his definition of 'wicked problems'. He calls '..class of social system problems which are ill- formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing "wicked problems".'3. Rittel lists eleven properties that make up wicked problems and are summarized below;

1. No definitive formulation of a wicked problem : The formulation of a wicked problem is in itself a problem.
2. Every formulation of the problem has a different ideal solution : Cannot formulate problem unless there is a solution in mind.

3. Any solution to a wicked problem can be worked on further.
4. Solutions can only be good or bad and not correct or false.
5. No exhaustive list of admissable problems.
6. More than one explanation of every wicked problem.
7. Every wicked problem is a symptom of a higher order problem.
8. No wicked problem or solution to it have a definitive test.
9. Every wicked problem is a one-off.
10. Every wicked problem is unique.
11. The wicked problem solution has no right to be wrong.

Rittel thus deduces that the 'wicked problems' approach is incompatible with the earlier design procedural models as problems and solutions are treated separately. Rittel states that when dealing with 'wicked problems', one cannot "first define the problem, and then the solution- solutions are generated all the time as problems are formulated".4.

2.3 URBAN DESIGN IN THE DOMAIN OF PROCESS & DECISION MAKING
argumentation, knowledge, and learning processes

Rittel acknowledges that analysis cannot be divorced from synthesis and that the first generation models were not a true reflection of the process of design. He sites the design solution to be a plan for the accomplishment of the solution, and not the solution itself.

The plan consists of three fundamental elements;

1. Deriving contextual performance from contextually based decisions. The designer is seen here as the operator of the object model and manipulates the parameters and assesses the measured performance.

2. Interchanging and cyclical processes of problem solving through the generation and reduction of variety.

3. Decision making through the process of argumentation.

Rittel regards argumentation as a key role in the improvement of decision making in the design process. The argument must however be structured and procedural, improving the content, decision and the product through time. An optimized solution is not regarded as the prerequisit of such methodology, but rather perceived as a process of negotiation or decisions through concessions.

The process of cognizance in decision making and design development is expressed through the formulation of structured arguments. The appraisal of such a methodology is seen to be directed by the inquisition of choice and the dynamics of options.

The opportunity for adaption and investigation are promulgated through quantitative techniques. These techniques take on an empirical and numerical system of analysis. Precision and reliability of obtained results are not seen to be objective, but rather the path that was undertaken in the process and methodology and the magnitude which are characteristic to the issue/event/problem. Under such conditions, the use of quantitative models may become quite useful, if they are not conceived with expectation of specific and reliable quantitative projection it may help gain insight about

possible implications of considered values for design parameters and the range of feasible solutions, and it may assist in the understanding of the behaviour of the described formal system.

Alexander radically departed from his "decomposition" model of the design process since the Notes of synthesis of Form were published. Alexander's new model describes the design process essentially as the process of acquiring knowledge and then making and then making

11.

decisions that reflect that knowledge. The key to this process is the quality and appropriateness of knowledge obtained prior to the solution of the problem. For Alexander, this is done with the help of patterns. His model operates on the premise that every human is basically a designer and that everyone has a set of patterns that provide for the design decisions. The purpose of patterns designed by 'specialists' is to correct existing patterns that are exhibit deficiency, and to 'improve' or add new patterns were required.

According to Bazjanac, "both Rittel and Alexander emphasized the importance of the understanding and consideration of other 'Weltanschauungen' in making design decisions".5.

The essence of Vladimir Bazjanac's approach to derision making in design is a model that in its explici. nature formulates a learning process. According to Bazjanac, the inception of the design process formulates the problem and them seeks to define the solution. The formulation of the problem is not final, but rather a reflection of the status of knowledge at that point in time. The solution is basically defined by the interpretation of the problem, and the search for the definition of the specific solution which fits best the knowledge at that particular time. Documentation of the solutions take

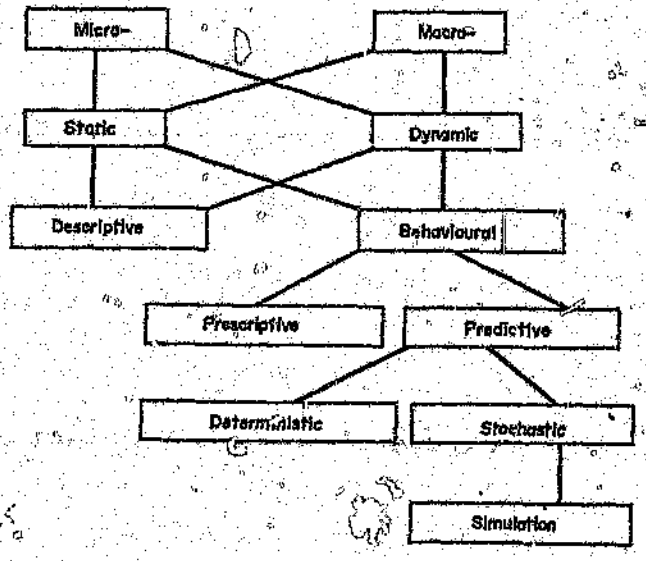
place as early as the problem stage and run concurrently to communicate the definitions of the problems and the solutions and acknowledge or reflect adoptions along such a process.

Furthermore the user is learning more about the definitions and the subsequent redefinition of the problem and solution. The process is repetitive until such time that one of the following conditions are met;

1. 'the incremental gain in knowledge has become insignificant and the understanding of the problem and the solution cannot change enough to warrant further redefinition;
2. the incremental gain in knowledge has become too expensive;
3. the available resources have been exhausted'.6.

This model has included the notion of the stopping rule as been the operator/designer, who Bazjanac sees as been the variable to the process and provides the discrepancy in the definition of the problem.

Essentially all the above mentioned models can be described as communication models that are directed by the inquiry of decision making through the process of problem solving.



1. MODEL TYPES AND THEIR RELATIONSHIP (Source Chadwick p 166)

2.4 MODELLING AS AN INTEGRAL COMPONENT OF URBAN DESIGN METHODOLOGY AND PROCESS

Design and its related processes and methodologies has in the contemporary period essentially been classified by two diverse points of departure. The one is essentially the protagonist of intuitive and creative design processes related to individual ability, whilst the other emphasizes systematic processes taking a more philosophical approach to design.

Most urban planning models are of the latter origin and simulation based which provide for process using mechanical analog or mathematical algorithm. In general and in urban planning, there are two basic types of models in accordance with the deterministic or conditional features to a problem : a) probabilistic, and b) deterministic.

The second type of model includes those in which time can be explicitly introduced into their structure, thereby obtaining the dynamic structure of a model. The stochastic method to which this procedure belongs is a premise of the concept of "maximizing entropy and ... an important factor in researching and planning urban systems, especially with the rise in the importance of information".7. Langendorf (1985) has suggested that "it is often perceived that these kinds of decision aids may not be well suited to decision making styles or to the nature of urban planning problems".8.

Heuristic modelling is suited for urban design applications as an effective and efficient use within a cohesively formatted structure. Heuristic approaches to analysis and model building are largely descriptive and phenomenological in nature and therefore are not usually

concerned with the detailed nature of underlying processes (Harris1965). Recognizing that there is no single representation that allows detailed consideration of the diverse concerns found in urban situations, it is possible to construct the model as a series of representations, each describing a specific aspect of the urban environment. It is thus possible to obtain composite representations that incorporate all of the relationships or descriptions found in each of the individual sets.

Shirvani sites the conceptual bases of design methodology to be placed into six groups of which only two opposing methods are briefly outlined below ;

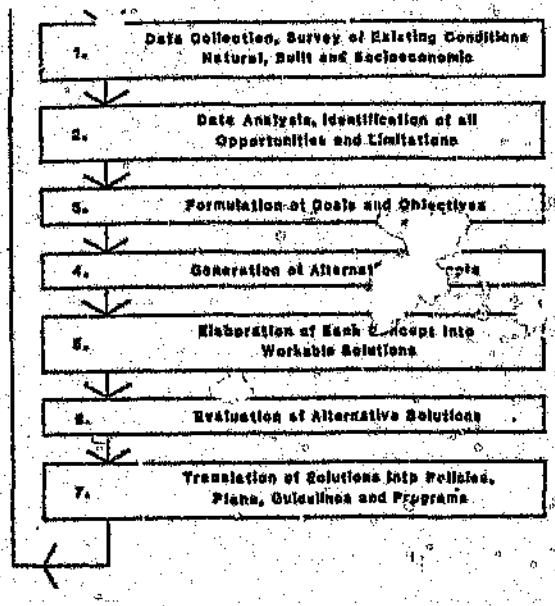
1. INTERNALIZED (Steinitz, 1979)

This method in design is essentially intuitive and subjective without principle rationality. It is the traditional method of design which is seen to hold the creative spirit at its core.

2. SYNOPTIC (Hudson, 1979)

This decision model provides a methodology to which a consistent form of comparability between alternatives can be achieved. The notions of value and uncertainty are included in the process. Ambivalence is reduced through analysis and the measurement of value and the predictability of different outcomes.

The following illustration of a synoptic model demonstrates within a select number of steps to achieve this ideal and to provide a logical progression by which alternatives reviewed can be analyzed and solutions proposed FIG



2. STEPS OF THE SYNOPTIC PLANNING METHOD
(Source Shirvani p111)

Both are relevant in an integrated design approach, as a process that accepts both methodologies is one which is cognizant of the limitations of an unbalanced system. Modelling must allow in its conception, a process and methodology that in itself has qualities of robustness and flexibility. These qualities must through the formulation and composition of the model, establish a programs that accepts creative input as an integral component of a sustainable framework. In the context of urban design, opportunities for effective urban intervention lies in the coexistence of both deterministic and creative processes and methodologies to design, and thus in the realm of dynamic modelling strategies.

2.5 MODELLING AND THE SYSTEMS APPROACH

A systems view of Urban Design

A model is a rather simplified abstraction of the real world. It can be used to describe either the theoretical abstracted situation derived from a deductive line of reasoning or the operational model used through systems approach. A model is used to establish the behaviour of the system been modelled , or in other words the goals and aims are to match the structure of representation with the structure provided by the problem at hand (REQUISITE VARIETY). In urban planning and design, models establish relationships between the inhabitants, employment for formal and informal economies (also know as upper and lower circuit models), traffic, housing, and business related components etc., This can be interpreted as a study which distributes the inhabitants "time budget in space. In addition to this, the model establishes the dynamics of realizing planned goals as well as their quantitative properties in different time cuts".10. Modelling can thus assist in the arrangement of spatial patterns over time.

In urban design processes the relationships analyzed through systems approach can be used to moderate trends considered to be undesirable and to focus on desirable trends and to evaluate amongst others development frameworks and strategies, economic forecasting and feasibilities, and land use configurations. Operational models, in identifying and quantifying strategic relationships, provide details of the instrumental variables that can and should be influential by policy and development in order to achieve objectives.

The polemic with regards to a systems approach in design contributing towards a mechanical design philosophy and producing inhuman urban environments is not advocated here. It is a fallacy that a broader design strategy cannot be inherently integral within the systems of modelling. Equal if not more efficient performance, and a greater probability of generating a coherent, anthropomorphic and imaginative design product can be achieved than traditional design strategies. The relevance of this statement is directly related to the ability of the system to be flexible and approachable to enable the development and advancement of social, professional and human creative interaction.

" The principles that hold for systems in general can be defined in mathematical language. It will be seen then that notions such as wholeness and sum, progressive mechanization, centralization, leading parts, hierarchical order, individuality, finality, equifinality,etc., can be derived from the general definition of systems: notions that hitherto have often been conceived in a vague, anthropometric, or metaphysical way, but actually are consequences of formal characteristics of systems, or of certain system conditions." 11.

A more useful definition of systems is expressed by Stafford Beer who suggests "would be based on the two criteria of complexity and determinism, giving a fourfold classification, from simple deterministic systems to complex probabilistic systems, via simple probabilistic, and complex deterministic systems". 12.

The idea of process is inherent in all systems, whether in a pro-active or inept state. Chadwick regards all systems to be flow systems, either through the transferal of information, energy, or matter, the operative action is the relationship which transpires through such circulation which is seen as the heart of any system.

Systems are however seen to be a continual process, whereby the incident of change will require evaluation through the transposition from description to understanding, and from understanding to prediction.

The process of setting up models is predominantly cyclical, moving from reality to conceptual and visa versa. Karl Popper(1965) sees scientific procedures "not by induction or inference based on many observations, but by conjecture and refutation". 13.

Chadwick places the process of scientific enquiry into phases which are not distinct, but rather inter-related:

Hypothesis -> Observation -> Test hypothesis -> Modify Hypothesis -> Observation --- and so on

The process is modified in applied scientific research and read as follows:

Formulation of the problem
Formulation of criteria which the problem solution must satisfy
Modelling the problem
Testing the model against the criteria
Testing the solution against the criteria
Implementing the solution

The phasing and content can be stated in a number of configurations reflecting a cyclical process.
When the problem is complex systems, the process must be extended to include:

Recognition and description of the system
Formulation of criteria for testing the system
Modelling the system
Testing the system model against the criteria
Projecting the alternative models of the system's future state
Testing the projected future state behaviour toward the desired future state.

2.6 MODELLING, PROCESS, AND VARIETY.
requisite variety

Chadwick notes that variety can be constrained by the deliberate process of modelling; that is to say that in the process of rationality, the capacity to explore many levels of variety is compromised by the pragmatic of such an application. Chadwick explanation to this occurrence is due to;

a. the world is made up of systems within systems and that variety is lost as only certain appropriate systems are studies;
b. define individual system through the medium of modelling.

c. " when we return to the real world to control the trajectory of the system, we increase variety to meet the circumstances of control".14.

The LAW OF REQUISITE VARIETY is seen as the main tool in understanding the ways in which systems can be controlled. W. Ross Ashby (1964) states that" only variety can destroy variety." 15. Thus a system that seeks to control another system should be characterized by a complexity commensurate with that of the system it seeks to control. With respect to variety Chadwick explains that "if a system is to adapt or to control its environment, it must contain at least as much variety as there is in the environment to be controlled, which is the Law of Requisite Variety,again".16. Ashby further suggests that a necessary component of organization is present when the relation between two entities become conditional upon the state of a third. Thus a model of a system is a representation of that system by another system.

The relevance with respect to urban design and in particular modelling is distinct, as processes and methodologies that are established within this framework must have inherent, the capacity to provide requisite variety to match real world systems at a level of variety which would augment the level of performance.

Rittel also defines the alternating phases of the design process as been cyclical with constant reference and interplay with variety. The designer continually goes through alternating sequences of generation of variety and reduction of variety. During the generation of variety he searches for relevant possibilities; during the reduction he evaluates them and selects the most desirable or the most feasible . Rittel views the whole design process as sequential problem solving in which

cycles are not at all linear; they form networks. Continuous feedback with the problem environment is an essential part of this model of problem solving.

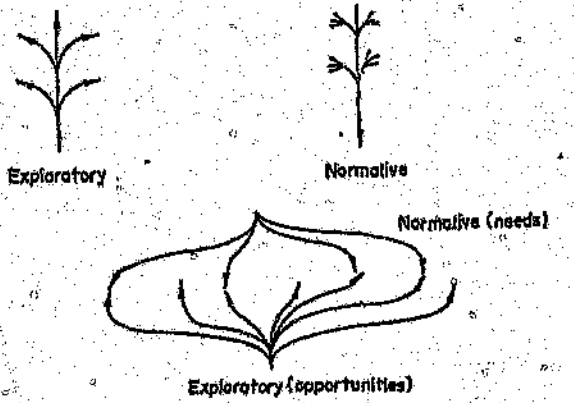
This computer model expresses variety through the symbiosis between opportunity and synthesis. A model must within its own framework, display facility and capacity to receive variety to facilitate operational research.

Sadowski(1965)p78 describes operational research as " methods which allow us to determine an optimum decision, or in other words, to produce an optimum plan for given conditions".17. Jenny(1960) describes O.R. as " optimizing the performance of a system".18.

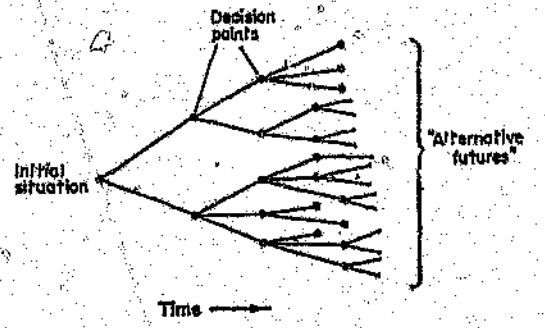
Operational research, is assimilated to modelling in urban design as it is developed from a scientific methodology which views the organizations and activities as systems and utilizes similar interchangeable techniques and applications. Hence the re-evaluation of decision theories in design through the development of simulated models .

They further deal with fragmentary structured problems that involve both qualitative and quantitative aspects, both involve abstraction from first hand reality for appraisal, and return through cyclic and circular processes, both are seen to deal with complex issues in a comprehensive manner," seeing the gestalt of the situation and its parts".19.

The difference between the two lies in the complexity of the system that planners and urban designers have to understand, the urban realm. Philosophical, psychological, and perceptual issues that encompass non-measurable criteria have to be approached with an objectivity and creativity that requires a different order of synthesis.



8. THE RELATIONSHIP BETWEEN EXPLORATORY AND NORNATIVE FORECASTING (JANTSCH)
(Source Chadwick p 174)



4. SCENARIO WRITING
(Source Chadwick p 170)

The relevant models for urban design are those that arrive from the processes of management of networks that are in equilibrium with the notion of variety (low or high variety) and are in control of systems.

2.7 MODELLING AND ASSIMILATION
exploratory and normative techniques

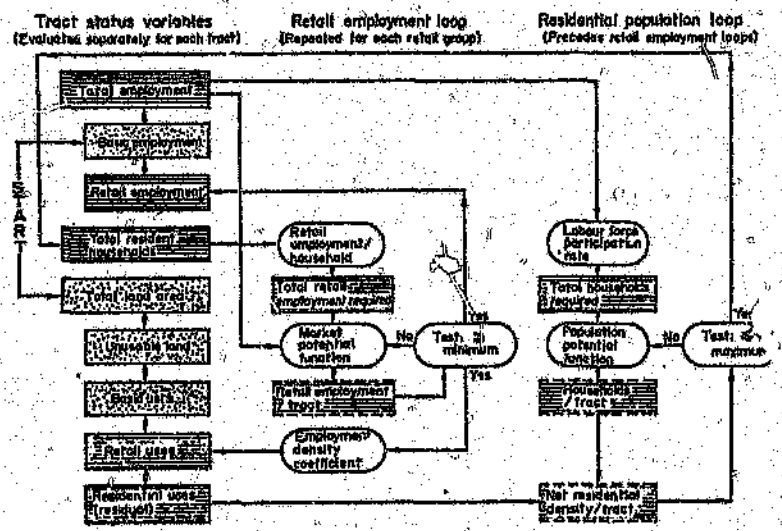
There are a number of systems that are assimilated into forecasting models and are defined as exploratory techniques and normative techniques (Erich Jantsch 1967). Although the objectives are not important to this paper, the methodology and process is.

The following are a few such techniques;

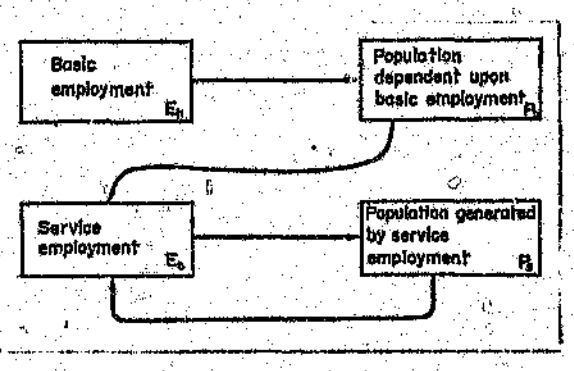
SCENARIO WRITING
This method is an exploratory technique and follows a decision tree structure starting from one point, "and investigating as many branches as are plausible which might lead on from any future intermediate situation". 20. FIG

The process is dynamic providing unfamiliar and rapidly changing situations along its path without carry over thinking from the previous stage. This approach thus provides alternative statements of feasible relationships and parameters at each individual stage of growth or development.

RELEVANCE TREES
An approach in normative techniques, it is formulated along vertical and horizontal relationships ;
Vertical where alternative sets of relationships are indicated through a hierarchy, moving from the general to the specific.



5. INFORMATION FLOWS IN THE PITTSBURGH MODEL (LOWRY)
(Source Chadwick p222)



6. THE BASIS OF THE LOWRY MODEL
(Source Chadwick p221)

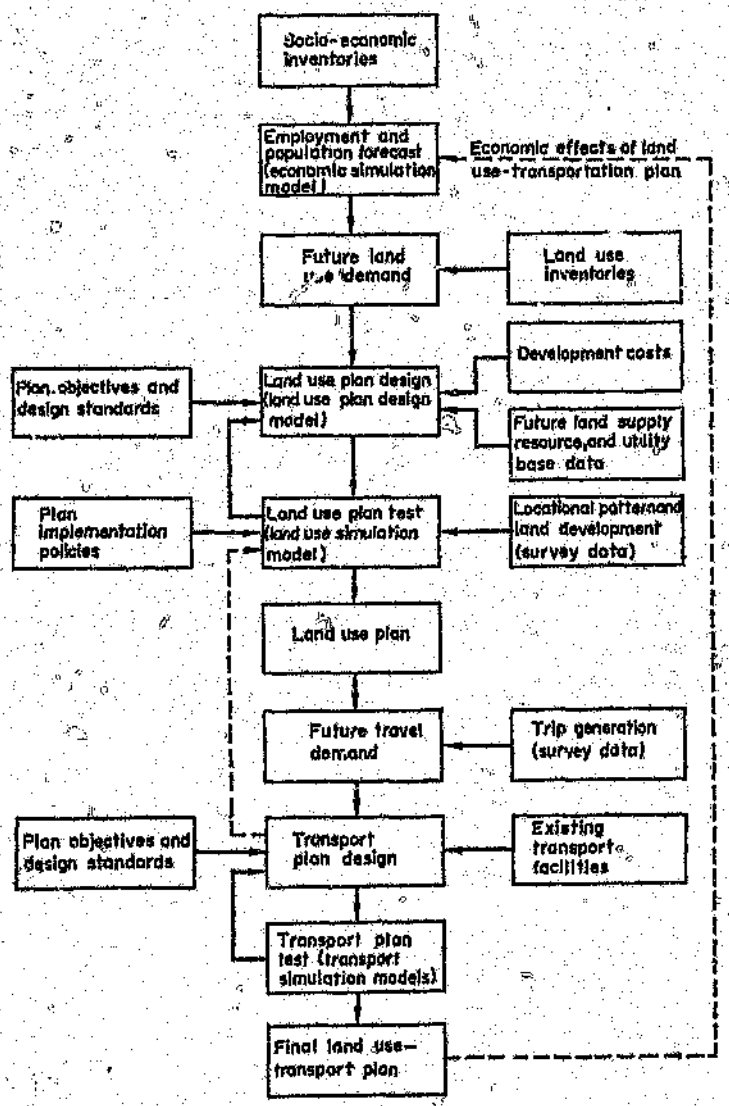
This method seeks relevance along alternative yet simultaneous paths, evaluating goals, objectives, and criteria within competing strategies, and identifying feasible alternatives and potentialities.
Horizontal where each level of the tree consists of relationships of the same classification.

This technique aims at enquiring into possible relevance along a single or set of relationships so as to structure and present such disposition on a tree format.

2.8 SOME WORKING MODELS OF THE DESIGN PROCESS
including linear modelling

Linear programming is discussed in brief as it forms an integral part of the working models discussed below.
Loomba defines Linear programming as"a method of determining an optimum programme of independent activities in view of available resources". 21.
The method is called linear programming because all relationships involved must be linear. In many cases linear programming requires Dynamic programming for more complicated studies. Although dynamic in accepting diverse structures and systems, linear programming's underlying principles are static in so far as the transferal of information is not interpreted as dynamic and opportunist, but rather as 'given'. This is seen as opposing a integrated approach to design and inherently limiting the capacity to providing positive decision making in the realm of influence and intervention.

The Lowry type Model is a system that seeks to locate function within a metropolis that relate to total population, employment, and legal and physical constraints on the land. The model is not based either "upon micro-analysis or upon macro-theory, but is phenomenological: the rules are derived empirically" 22.



7. FLOW CHART OF THE WISCONSIN PLANNING SYSTEM, INCLUDING A LAND USE PLAN DESIGN MODEL (Source Chadwick p246)

and within a static equilibrium and no time dimension. Allocation rules are utilized in the generation of relationships between work and home, retail and retail catchment population and retail. FIG.

The strength of the model according to Lowry is its emphasis upon spatial relations between different activities, although other variables do not include all those necessary for a full description of a market place.

Schlager's Land Use-Transport Study System is based on four interactive models. Chadwick outlines the input - output arrangement performing in the following sequence; Firstly, an Economic Simulation Model accepts socio-economic inputs and predicts future land use demand variables. These variables together with land use, economic, resources, and utility data, form the input to the Land Use Plan Design Model. This in turn, is used as input to a Land Simulation Model, the output being a Land Use Plan. The plan is used as the basis for a transportation network design to meet travel demand predicted from the plan by application of trip generation data. The plan is tested by a Transportation Simulation Model, the output been being the final plan combining both uses and transport network. FIG

Without labouring into the workings of the system, the principle procedures utilize linear programming, simulation techniques, and input-output devises. Exogenous input from various socio-economic and political sectors are appraised and decisions are made which results in new levels of output, the effects which spread through the system via input-output relationships, simulating the behaviour of the various sectors in the region. The model is repetitive in operation, as to determine a series of results. The problems with the above system are the limitations that are inherent in the system of linear or even recurrent linear programming as

the measure of optimization is primarily reduced to two dimensional significance. The limitations set by data and the difficulty of dealing with multiple, rather than single goals are also evident.

The importance in its commendation is the level of accuracy it can attain in reproducing the development of study area and its projections over a ten year iod. Its integration process which incorporated other models into the system providing a variety of salient data for a wide range of concerns, and the subsequent and comprehensive results that included fundamental levels of resolution are noted.

2.9 MODELLING IN AN ECONOMIC REALM

The level of universal economic activity affects the success of economics at the micro-level. In return, micro-economics, especially property, and land developments, influence the macro-economy. The micro-level is sensitive to economic fluctuations (international) and business cycles (national/regional). According to Barrett and Blair, there are four major types of economic fluctuations on the macro-level;

1. Random fluctuations.
2. Seasonal fluctuations.
3. Business cycle.
4. Secular trends.

Further to these types, they advocate that property, in the micro-economic and urban context, is mostly affected by business cycles.
Firstly, property and the construction market are highly sensitive to pessimistic social and political outlooks, which influence the up and downswing of the macro-economic world.

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3. Business cycle.
4. Secular trends.

Further to these types, they advocate that property, in the micro-economic and urban context, is mostly affected by business cycles.
Firstly, property and the construction market are highly sensitive to pessimistic social and political outlooks, which influence the up and downswing of the macro-economic world.

Secondary, the property market cannot be replaced, only repaired and remodelled.
Thirdly, the borrowing of money, inflation, and interest rates are determined at the macro-level, either by political circumstances, or and the government.

Appraisals through economic prognosis, can facilitate towards a more cognitive relationship with the nature of the city, which in turn allow for identification of underlying causes of urban problems and possible solutions and strategies to deal with these problems.

A few approaches are listed and outlined below;

2.91 FINANCIAL INVESTMENT APPRAISAL

This appraisal deals with estimates in cash flows, capital gain and expenditure on proposed investment projects.
It aims, to determine the financial implications of alternative investments and is confined to emphasis of financial costs and returns to the investor. Investment appraisal involves discounting values/moneys involved in the project up to date of decision i.e. inherent costs (running costs), and returns (marginal and nett). This appraisal is however restricted in analysis to items which are subject to the macro economic market trends.

2.92 CHECK LIST OF CRITERIA

This approach of analysis deals with the evaluation alternative and specified criteria.
The preferred alternative is viewed with subjective judgement according to the criteria employed. The analysis essentially provides for a procedure of elimination, whereby the criteria creates a platform of options based on the number of disadvantages as well as the greatest overall benefit.

2.93 GOAL ACHIEVEMENT ANALYSIS

This approach is essentially extension of the previous analysis.
Emphasis here is in the quantifying of objectives and specifications within set criteria's. In other words, the criteria's established are ultimately formulated from explicit or general aims of a particular program.
Four main characteristics are outlined below ;

1. Goals or objectives are always formulated from the outset, prior to design and subsequent analysis.
2. Multi-dimensional goals that take cognizance of the physical environment, political issues, cultural events etc.
3. Goal that compare mutually exclusive plans only.
4. Objectives in the evaluation process hierarchically listed to their relative and respective importance prior to the comparative analysis of plan consequences.

Of the various methods that exist in this analysis, the 'goal- achievement matrix' developed by Hill, is according to Litchfield the most sophisticated and well known.
Although this method follows the characteristics of two and four stated above, its distinguishing features, according to Litchfield are 'the attention given to equity consideration and the use of a hierarchy of goals'. 23.

2.94 ASSESSMENT OF RESOURCE COST

This analysis assesses the values of resource to the community.
That is effected by urban and regional developments. Examinations are directed at both establishing and operating costs of providing resources in future projects.

2.95 COST IN USE

In evaluating both private and public capital and operating costs involved in urban development. Essentially, this methodology attempts to project cost relating ' alternative growth rates of growth and change in the spatial distribution of population and alternative standards of quality that could be adopted for housing provision'.24.

2.96 THRESHOLD ANALYSIS

'Threshold analysis concerns those physical characteristics of an area which would cause significant fluctuations in the unit cost of future urban developments. It thus only deals with costs which vary in location. The main subject of investigation is those cost of location (both capital and operating) associated with residential development, although in principle the analysis may be applied to other land/users such as industry and commerce'. 25. While threshold analysis may be used to search out solutions to accommodate future urban growth, it recognizes that cost alone should not be the only benefit for predicting future patterns. The benefits will generally vary a great deal among urban development possibilities, and go beyond the variations in costs.

2.97 SOCIAL COST BENEFIT ANALYSIS

This analysis concerns itself in the possible social benefits of public sector projects, with particular reference to resources.
A. William defines this analysis as 'essentially a means of adapting the rules for profit maximizing investment behaviour by private firms to fit the different circumstances under which governments operate, which in turn means trying to take account on the one hand of

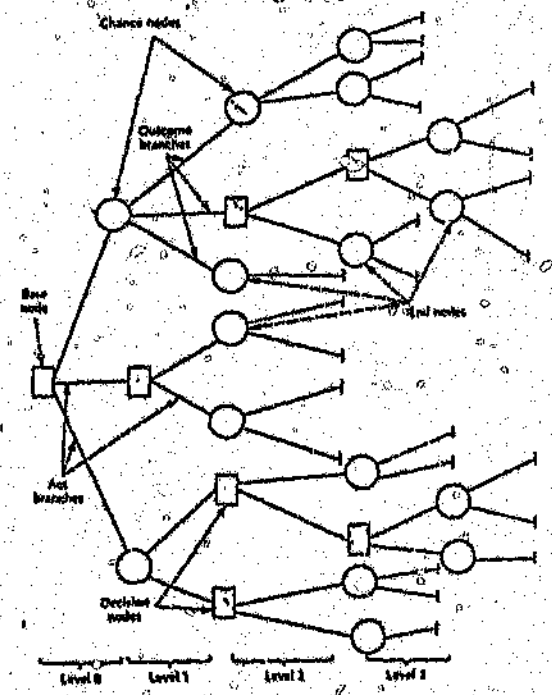
externalities and the peculiarities of "public goods" compared with "private goods", and on the other recognizing that the budgeting processes of government may require further reformulation of the rules if they are to be appropriate in a setting which is far removed from the classical one of a small firm operating in a large and perfect capital market. 26.

The decision makers here are cognitive of benefits to the individuals on many levels through their evaluations. The analysis seems to provide a frame ork for an improved environment, individual behaviour and improved services.

2.98 DECISION MAKING MODEL

The decision to develop relies on the number of important issues:
Firstly, it depends on the individual/group investment circumstances. The process involves initial capital outlay and ultimately investment return/income, and capital growth over time. The initial action that is required is that of analysis and the resultant decision. There are a number of models/approaches that one can be involved in to clarify and optimize the investment. The decisions can depend on financial gains for individual developers in the private sector and regionalistic benefits for the community.
In short a profit or non-profit decision.
Decision Modelling can be used in virtually any decision making process which has an element of risk or uncertainty or both. Risk in this context would infer that any particular action has a number of possible outcomes which are not entirely definitive or possible. Uncertainty would imply certain action with probable outcomes that are not known.

The basic decision structures use two techniques
a) Tree b) Matrix
The structure is characterized by four procedural components;



6. THE GENERAL FORM OF A DECISION TREE
(Source Litchfield p186)

1. Different future states of nature can occur after an action is taken.
2. The decision in each case must be cognitive of the effects of the variables in states. Each state possesses a probability that prescribes frequency with which that state will occur.
3. Each decision model has a subsequent set of action and alternatives. Where there are several stages of decisions, to or set of decisions are possible, and likewise for states. Each act-state pair have an associated outcome.
4. Each decision criterion must be selected and applied to the model in such a way so as to arrive at a solution, with associated expected payoffs and expected utility criteria.

The assumptions of the decision model under risk are, therefore, the following. The decision maker (or user) is rational and is able to prescribe

1) an acceptable set of acts;
2) a mutually exclusive, collectively exhaustive set of states;
3) a payoff for each outcome.

The basic structure of a tree model consists of nodes and forks or branches. There are two nodes-decision and chance nodes, and two types of branches, the act branches that emanate from decision nodes and state branches, that emanate from chance and end nodes. At the terminus of outcome branch is the predicted payoff.

Larger decision trees may involve states of decisions i.e. multi-stage or sequential decision models. Here, a sequence of decisions are possible. Probability theories/techniques play a major role in these models i.e.

a) probabilities associated with future states;

b) conditional probabilities determining the worth and value of information obtained;
c) Prior probabilities.

Evaluation plays a role not only in the optimization techniques, but also an integral part in the decision making process. There are many methods of evaluation, each providing a framework to achieving set requirement. A number of different approaches are listed:

1. Financial investments appraisals.
2. Check list of criteria.
3. Goals - achievements analysis.
4. Assessment of resource costs.
5. Social cost -benefit analysis.
6. Planning balance - sheet analysis.
7. Optimization techniques.

2.981 OPTIMIZATION TECHNIQUES

The validity of any decision making process is to ultimately benefit in the best possible way the community of independent private interest. The optimization of any project in terms of social benefits or and financial circumstances must also be emphasized. Optimization techniques allow for a process which addresses the design and evaluation is easier to formulate on a mathematical basis than in social/ community terms, as figures can always be calculated in adopted/modified to create an optimumsituation/circumstance/event/investment. Itopens options and allows for a thorough understanding of the creative analysis of the project. Optimization also allows reduced risks and more thorough descriptions, it extends and develops the feasibility model as it is more descriptive rather than prescriptive. Analysis through incremental data can allow for various options with various returns. Threshold analysis techniques are utilized in the initial stages of this program i.e. reducing variables for establishing preferred outcomes.

Micro economic based models can contribute to local economies in so far that they can provide both the private and public sectors with positive information i.e. investment decisions through feasibility studies and optimization techniques. They are however limited by activities at the macro economic level in that predictions and forecasts can be distorted by an event beyond there control. Perin points out that "'economic determinism and political factors are the usual directive for the larger-scale environmental designer". 27. shirvani Thus political economy forms the institutional decision framework for planning and urban design.

2.99 ◦ RESOLUTION AND DIRECTION

Urban design is increasingly becoming the province of rational sciences. Parallel to the most efficient and effective design techniques is research into the psychology of thought and decision-making. There is the examination of the practical organization of information, analyses and selections, and finally therefrom the emergence of a acceptable design. The object being to arrive at a framework of procedure within which imaginative and creative ideas can be freely generated and most effectively controlled and utilized to the desired end in reasonable time. This methodology is seen to present design potential in the architect and town planner, to enable the development of better buildings and environments.

The problem of operating the system does not result from the inability to operate the mathematical system, to assure its feedback, but from the need for educating professionals who will enable its practical application in a multitude of disciplines.

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Universal models of design and thinking are not always relevant. Rittel recognizes that "within a given design context, a particular design configuration will lead to a particular performance". 28 Cognisance must therefore be taken that the implementation of two dimensional, irrelevant and non-contextually based models enhance the loss of individuality and the prevalence of mass psychology : the degeneration of human beings into mere measurable units subject to analysis and processing : the shift from the particularity of the individual and his culture to the generality of the organization and the universal urban culture.

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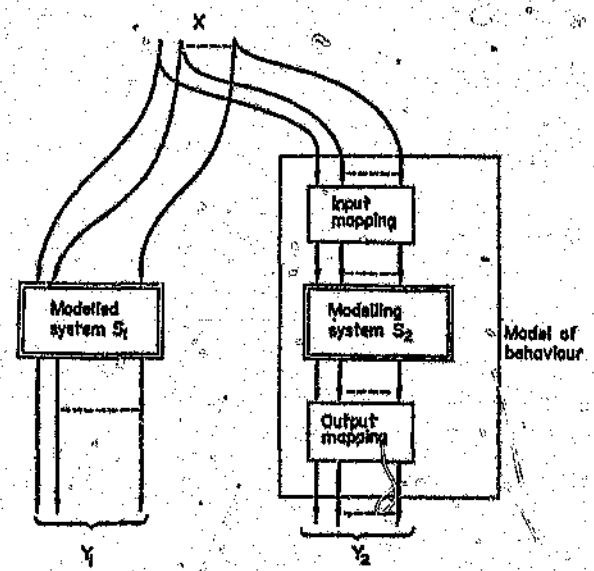
CHAPTER 3



9. THE RELATIONS BETWEEN A MODELLED SYSTEM AND A MODELLING SYSTEM, WHERE S1 AND S2 ARE SYSTEMS OF EQUAL BEHAVIOUR.
(Source Chadwick p191)

C H A P T E R T H R E E

THE IMPORTANCE OF MODELLING

3.0 OPPORTUNITY AND SYNTHESIS
symbiosis between agent and process

The basis to the development of a modelling package is a response to the inherent procedural nature of urban design thinking.

This process reflects on the diversity and complexity of development dynamics and seeks to evaluate and become cognizant of the opportunities that are manifest from the potential efficiency of modelling techniques. The establishment of a process which understands the importance of both choice and the abiliy to explore options is the essence of any procedural approach . Modelling within the urban design context requires and understanding of both broad and specific issues within a multi-disciplinary framework.

The model can be seen to be valuable in a process that accepts the possibilities to extract from the system any particular set of attributes, evaluate them, and return the altered attributes to the process to test the appropriateness of those particular design solutions. It is possible to extract either all the attributes for a given component, such as all of the data associated with a particular development, or one set of attributes for all the components, such as the frequency rate, parking ratios, or density for all the structures. This information could then be utilized in an existing simulation program to evaluate a specific design scenario and then returned to the system where the altered attributes could be examined in the context of the rest of the model.

Various options could be developed and placed within the model to evaluate their effectiveness, not only in relation to adjacent buildings, but in terms of their impact on the other attributes sets within the model. This evaluation process is seen as one of the most important components and features of urban computer modelling. It offers the possibility of consistency and control over the generation of data and values(monetary and other) for evaluation purposes that is not possible using traditional tools of design.

Modelling also acts as the tool to urban design analysis and is especially suited or a broad context to ;

* evaluating the relative merits of alternative courses of action affecting and influencing economics within urban syste
* providing foundations on whic olicy decisions can be based.
* in the realm of graphic representation, it can provide for a myriad of visual portrayals depicting areas of growth, land use, height analysis, or and including new proposals superimposed over existing structures and systems.

It is essential that the program should remain fluid to accommodate possible shifts of emphasis during the design procedure.

Modelling further offers the opportunity to vastly improve the coordination of information among the major players involved in a complex urban design problem.

The model has the potential to integrate and optimize the responses of the design profession to the problems of the city. It has the potential for reducing the occasion for the isolated solution, taken out of either its physical, economic, or social context. At a time of restricted funding and budgetary r straint it is necessary to

optimize the effect of the often limited number of interventions and restrictions that urban designers can make. The model in itself provides the opportunity for urban design to extend it realm of influence into a broader spectrum and diverse range of intervention. The descriptive rather than the prescriptive nature of urban design allows for process to facilitate for the inherent dynamics of the urban realm.

3.1 MODELLING AND THE PERCEPTION OF UTOPIA

Cognisance must be taken with regards to the limitations of computer or any other type of modelling. Large or small, modelling is not intended to resolve all problems nor find all the opportunities, or be able to optimize and satisfy all criteria relating to design decisions and urban design processes.
Modelling must therefore not be seen as the remedy that will revive the urban environment from its present state and its myriad of problems. The system could not, nor should it, attempt to describe the whole range of intangible issues and concerns in the city.

It suffers from the same unavoidable danger of oversimplification that is inherent in any abstraction or model. In addition, it is always possible for a model to be used in correctly or for the information presented to be naively interpreted. Thus, like any model, its effective use is predicated on a knowledge of the model and the limits of the information being presented. The importance of modelling lies in the understanding of the systems concerned and the knowledge that a model will give with regards to decisions and possible outcomes that will result from those decisions which are not necessarily functions of any particular size of model.

A model is ultimately a tool to the process and methodology of urban design amongst other disciples and must be comprehended as such. A model such as this is one of a number of valid approaches to urban design.

3.2 ABOUT COMPUTERS

great advantage of computer use in modelling is the ficiency in the relationship of time to performance. s consideration is important as a multitude of 'runs' expressing parameters, options, feasibility etc. could be achieved in the shortest duration of time to evaluate and compare relevant or irrelevant data/figures/values/ issues etc. Comparison is essential as a basis for making decision.

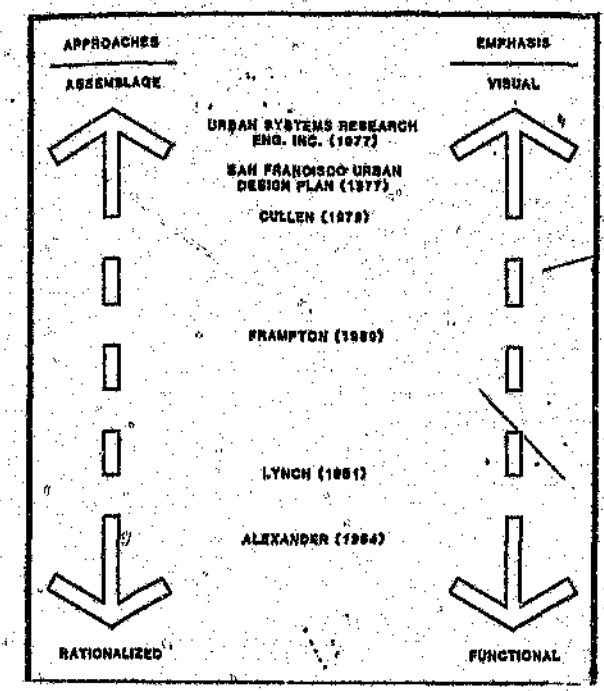
The computer can further handle a vast and diverse quantity of data very effectively, and can minimize errors obtained on hand calculating methods. The further importance of this capability is the ability to illustrate large amounts of primarily numerical information at any given time and is useful in appraisal of relationships of any information.

The versatility of the computer is almost endless.

The compatibility of programs to be integrated and used concurrently with other programs or to relay information from one data base to another provides for a vast amount of integration.

Another important opinion of computer modelling is that it can act to 'fill the gap' with regards to other existing systems. This holistic notion is seen to derive from the establishment of sub-models within models that work through an internalized and integrated framework, providing for a network of information that can be utilized within greater structures complementing their capabilities.

CHAPTER 4



10. DESIGN CRITERIA CONTINUUM: VISUAL-TO-FUNCTIONAL AND ASSEMBLAGE-TO-RATIONALIZED APPROACHES
(Source Shirvani p146)

C H A P T E R F O U R

4.0 PROCESS AND METHODOLOGY

This chapter provides for a description of the aims, goals and objectives of each model, and also the processes and methodologies that are undertaken.

4.1 URBAN DESIGN SENSITIVITY ANALYSIS

The importance of this analysis is to explore the potential and the performance of development options and scenarios as seen through urban design principles .
The bases for this study is reflected through the process of cognizance and perceptual appreciation for issues pertaining to the development of the site, contextual and regional issues, sensitivity towards development prospects, external and internal factors influencing the development. The notions of criteria play an important part in the methodology of the model as it provides not only guidelines for a psychological framework of design, but seeks value equity in the evaluation and implementation of design parameters and principles.
Cognisance has been taken that the criteria chosen are directives of design principles and are through their application providing supervision and awareness to the multifarious issues pertaining to the urban realm.
In advancement of this procedure, Sommer(1969) "has observed that while performance criteria have been developed for certain design situations, such criteria typically address only a single dimension of a situation, while the issues addressed in practical planning and design require a multiqual approach" 1.

CRITERIA	SAN FRANCISCO URBAN DESIGN PLAN	URBAN SYSTEMS RESEARCH AND ENGINEERING, INC.	LYNCH
ACCESS	CLARITY/ CONVENIENCE	ACCESS AND ORIENTATION	ACCESS
COMPATIBILITY	HARMONY/ CAPABILITY	FIT WITH SETTING	FIT
VIEWS	SCALE & PATTERN VISUAL INTEREST	VIEWS	VIEWS
IDENTITY	CHARACTER/ DISTINCTIVENESS DEFINITION OF SPACE	EXPRESS OF IDENTITY	SENSE
SENSE	ACTIVITY	FIT WITH SETTING	SENSE
LIVABILITY	AMENITY/COMFORT SCALE & PATTERN VARIETY/CONTRAST VISUAL INTEREST	CARE & MAINTENANCE ACTIVITY SUPPORT VISUAL COMFORT CULTURAL ELEMENTS	CONTROL VITALITY

11. A COMPARISON TABLE BETWEEN THREE TYPES OF DESIGN CRITERIA
(Source Shirvani p147)

According to Shirvani, there are three basic types of design criteria related to the processes in urban design; measurable, non-measurable, and generic.
Although each criteria work independently, a high degree of overlap exists amongst these three groups.
Measurable and non-measurable criteria are found in the urban design sensitivity analysis component of the model.

The premise for appraisal is formulated along a question-answer format. Certain values, norms and hypothesis form the bases upon which the criteria are used in making choices. These are embodied in the ideal schemata. Built environments reflect and encode these schemata and order. The order expressed through the choice process, or the image that is to be encoded and given form, is a set of cognitive schemata and ideals.

The optimizing criteria of the model are derived from very many individual and group values which respond to the changes induced by the very control over the system that the model may attempt to exercise.
The following constitute the categorization of values, goals and objective that form part of the strategy of analysis ;

VALUE
A value is something which is prized as of great worth and desirability ; that which is respected and motivates action and goals. There are two types of values;
WELFARE
Well-being - fit, integrated
prosperity - feasible
skill - proficiency in practice
enlightenment- knowledge, insight, information

DEFERENCE
Respect - prestige, character, recognition,
rectitude - virtue, goodness, righteousness

GOALS
A goal is an aim or purpose; it is a more specific desirable state than a value. Goals are derived from values.

OBJECTIVE
An objective is an aim, or an end to an action or reaching point.

Mackenzie provides an interpretation of Talcott Parson's hierarchy and is arranged and phrased as follows:

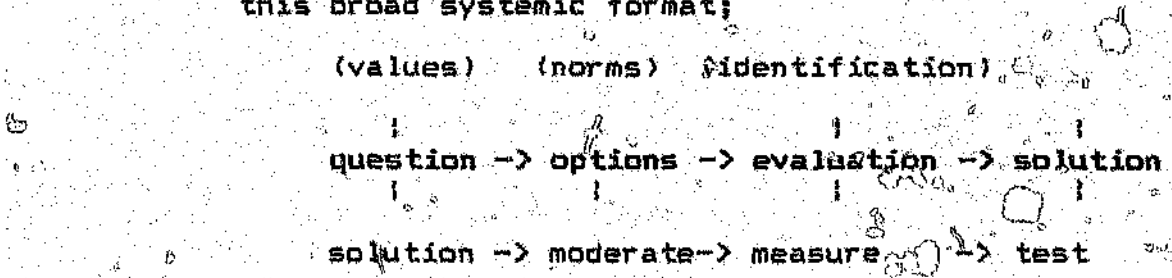
Values	-> Motivation
Norms	-> Social regulation
Goals	-> Organizational structure
Situation	-> Objects and tools

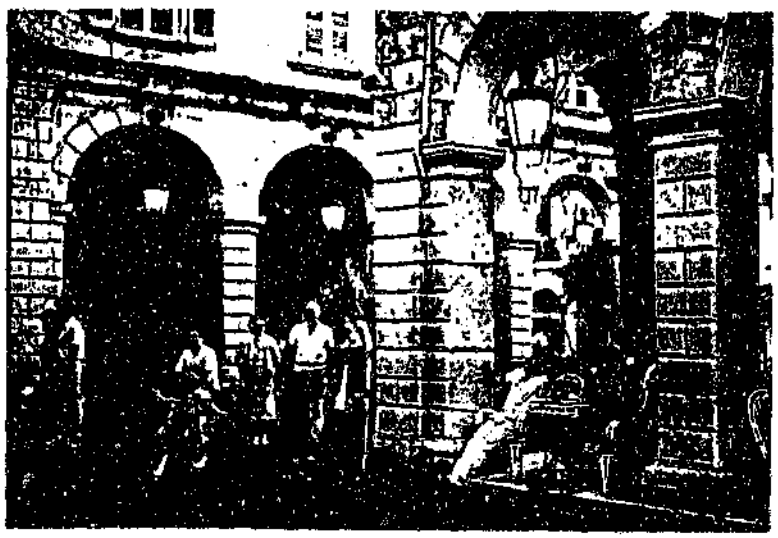
These components form part of the criteria that are established for appraisal of the following sectors of urban design;

* DESIGN DEVELOPMENT AND PRINCIPLES
* LANDUSE
* TRAFFIC AND INFRASTRUCTURE

THE MECHANICS OF THE SENSITIVITY ANALYSIS MODEL

In the evaluation of development parameters and performances, the model follows a process encompassing this broad systemic format;





Within the broad methodology, exists the evaluation based on deterministic structuring processes. The following process exhibits the sequential function of the model;

1. question -> response -> result -> base value
   (symbol) (numeric)

2. base value-> average -> result -> derivative value

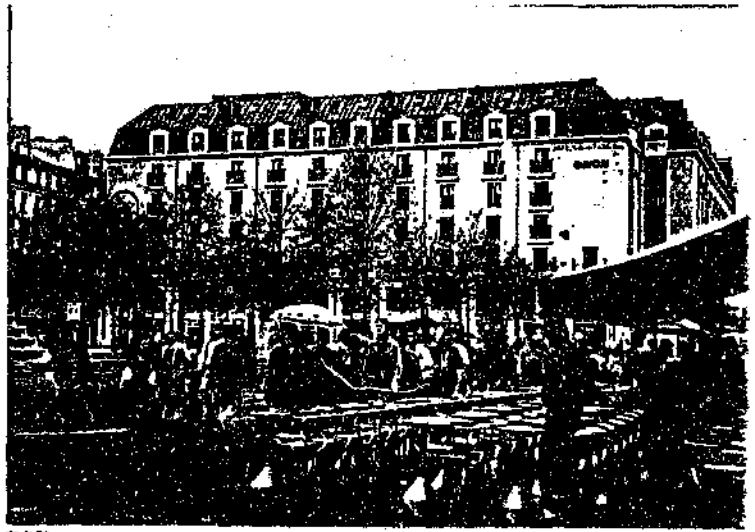
Question provide response and then reflected in a result which is given a numeric value, were the resultant values provide a measure of performance against the established criteria. The value in a numeric sense is not important here, but the derivative value is (derived by taking base values for individual criterion appraisals and then calculating the group average value). A summation chart or matrix exhibits the derivative values and their resultant performance in relation to each of the criteria. The elements that performed best are taken on to further investigation through the utilization of sub models depending on the requirements of the development proposal.

The following criteria have been elected for elaboration and listed under each sub section ;

D E S I G N P R I N C I P L E S/D E V E L O P M E N T

SCALE

The considerations of achieving a human scaled urban environment is the prerequisite of this criterion. Focus is given to size and massing of building or group of buildings or large developments. The characteristic typology and related scale of each individual development and its potential impact on the environment is also examined.



SENSITIVITY

Contextual sensitivity an compatibility of development with regards to land use and activity (noise, pollution, times of use etc.). The potential for sensitivity towards values (land and perceptual) related to study area.

INTEGRATION

The appraisal of synchronized and appropriateness of "architectural and aesthetic aspects as well as on the relationships to topographical and built form in terms of transitions, complementarity of scale, and massing".3.

DESIRABILITY

Evaluation of the potential and the necessity of the development in the area, and the capacity to entice activity and use.

IDENTITY

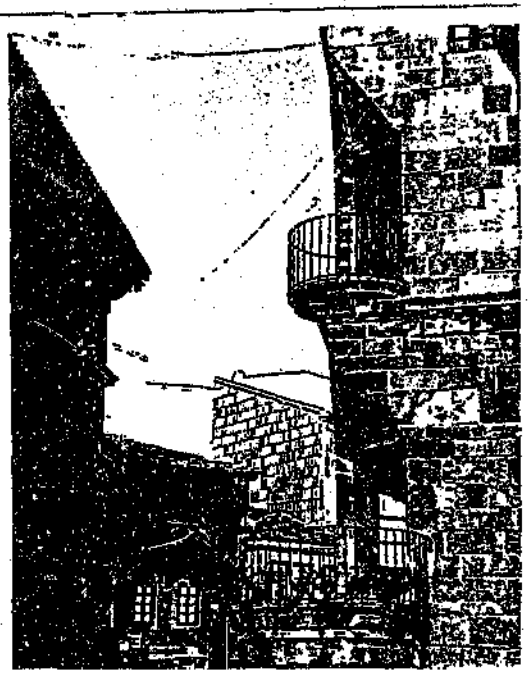
"The social and functional importance of the visual expression of an identity, status, and self-image valued by users and community" and providing a development capable of been "visually comprehensible" 4.

CHARACTER

"Character distinctiveness underscores the importance of providing definition and identity or individuality for structures and urban spaces to set them apart from surroundings and contributes to....individuality".5.

VIEWS FROM THE ROAD

The principles of views "encompasses such aesthetic issues as the value of pleasing vista as well as the perceptual aspects of human orientation in the urban environment". 6. The location or the potential location of buildings, their massing and the generation of focal, terminal and rhythmical components that can provide aesthetic character, visual accessibility, and identification of disposition.



VISUAL INTEREST

The intrinsic nature of a development and the opportunity to provide visual interest in its context is questioned. The generic of the land use development option in relation to its potential 'perceivability' is also assessed.

AMENITY/COMFORT

"The livability qualities of the urban environment and, in particular, the ways in which the city accommodates the pedestrian with street furniture, plantings, roadway design, protection from the weather, avoidance of glare, and so on".7. The amenity which is potentially and contextually more public in function and affords benefit for the community is also noted.

ARCHITECTURAL RESPONSE

The expression of the building/development in its formal architectonic sense and the opportunity to avail itself to the broader issues of its environment. The cognisance of typology and its degree of detail in a normative context. The potential as a landmark is also appraised.

CONTROLS

The ability to provide incentives and controls to the development ensuring contextual equity based on principles and guidelines established though design criteria. Control is also evaluated through the "degree to which the use and access to spaces and activities, and their creation, repairs, modification, and management are controlled by those who use, work, and reside in them".8.

ORIENTATION

Orientation of development or structures with regards to climatic criteria on the one level, and direction for the community, user, or conjectural visitor on the other

LANDSCAPE

The provision and opportunity of landscaping that can either integrate with the existing landscaping, or/and specific landscaping to an area or development.
The provision or the potential for soft urban spaces to be established of variable scale.

ROBUSTNESS & FLEXIBILITY

The ability of the land use, development, township, or study area to be adaptable and endurable to the notions of change and requisite variety, yet vigorous to the principles manifest in its inception.

DISTRICT CONTRIBUTION

The evaluation of the development with regards its contribution on a local, city, and district scale.
The physical and non-physical benefits that will be derived for the community and environment.

L A N D U S E

VIABILITY

Evaluation from past, current, and future economic and social trends for the development of potential land use for the study area are important .
Exogenous knowledge and information is required to formulate a relevant value statement.

FEASIBILITY

Feasibility can be approached from two positions; pragmatic and economic. The pragmatic deals with the relationship of landuse to the allocation of land (size, topography,). The economic prognosis is broad and based on 'rule of thumb' approach and through experience of related conditions. The detailed feasibility study forms part of the sub-models.

LOCATION

Relationship between landuse and locations are evaluated through the appropriateness of environment and context in which rights would be ideal.

LETTABILITY

Relationship between landuse and lettability are evaluated through contextual and regional considerations. Trends on landuse dynamics with regard to the economic level are also noted.

ACCESS AND CIRCULATION

Appraisal of landuse to existing patterns and parameters relating to access and circulation including "ability of persons to reach other persons, activities, resources, services, information, or places, including the quality or diversity of the elements which can be reached". The principle issue pertaining to access is "to what things is access given and to whom is it afforded".2.

FLEXIBILITY

The ability for the landuse to assimilate and absorb a diversity of activities, states, and interventions.

PARKING

The capability to accommodate parking requirements and demands pertinent to the landuse. (Cognisance is taken that accuracy can only be obtained through the actual drawing up of each bay)

VISIBILITY

Evaluation to the relevance and appropriateness of the site/development to the notion of visibility/exposure, that which provides for an intrinsic perceptual relationship with the community or the transient observer.

IMAGEABILITY

Examine the "adequacy of behaviour settings" and measuring of "place and whole patterns of behaviour"10. relevant to individual landuse. The potential of individual landuse to communicate within existing perceptual values and conveyed through activities manifest through the rights of the landuse.

COMPATIBILITY

Analysis of landuse in relation to other existing or future landuse. Another aspect of evaluation is the "the diachronic, or cultural, component of compatibility".11.

PRESENT POLICY

Examine if landuse corresponds, negates, or deviates from existing policy with regards to rights and restrictions.

T R A F F I C & I N F R A S T R U C T U R E

PUBLIC PARKING

Assess on a broad level the conditions of landuse in relation to the provision of public parking.

PRIVATE PARKING

Assess on a broad level the conditions of landuse in relation to the provision of private parking.

No of PARKING BAYS

Assess on a broad level the conditions and impact that parking would have on the landuse and related environment (parking on site, street, or basement).

ACCESS/EGRESS-SITE

Examining the conditions and demands of the landuse in relation to existing status, patterns, and restrictions.

PEDESTRIAN ACTIVITY

Evaluating the generation of pedestrian activity and it consolidation with existing pedestrian patterns and facilities.

TRAFFIC CIRCULATION

Examine existing traffic flows applicable to the site and landuse (data obtainable from local authorities), and assess against traffic generation from landuse.

FUTURE DEMAND

Examine existing traffic flows applicable to the site and landuse (data obtainable from local authorities), and assess against traffic generation from landuse. Also to assess the site/development in the context of future demands in the area.

DEVELOPMENT POPULATION

Survey the inherent relationship between landuse type and user population. Evaluate against capacity and impact on region/district/local context and to facilitate potential influx.

VISITORS TO DEVELOPMENT

Survey the inherent relationship between landuse type and visiting population. Evaluate against capacity and impact on region/district/local context and to facilitate potential influx and pull from existing environment.

SERVICE VEHICLES

Assess on a broad level the conditions of landuse in relation to the provision and requirements pertaining to service vehicles.

SERVICES

Assess on a broad level the conditions of landuse in relation to the provision of services and the capacity/availability of existing services.

EXISTING INFRASTRUCTURE

Assess on a broad level the conditions of landuse in relation to the provision of infrastructure and the capacity/availability of existing infrastructure.

This is by no mean seen as an exhaustive list of crite ia, but rather as bases to expand and retract according to the status of inquiry or appraisal. The mechanics of the process are seen to provide a positive interaction between that which is know, unknown, and that comprehension for issues pertaining to regional, contextual, and socio-economic circumstances are exposed.

The importance of a study of this nature provides the user not only with a further insight into the nature of each potential scenario, but the cognizance that is obtained from such a research would be of psychological significance as the design approach would be altered from an ambivalent to a benevolent methodology.

This study improves decision making in design, and also acts as a strategy to expand knowledge used in design.

4.2 TRAFFIC AND INFRASTRUCTURE

This model is based on deterministic structures, through which values are modified to take on various scenarios. These are evaluated and comparisons established with regards to the potential within existing options.
The system aims to display the capacity, constraints and parameters in relationships between ;

* bulk of development and parking in terms of constituent requirements
* bulk, size, height, parking
* development and frequency of use
* landscape, coverage, residual spaces
* development ergonomics and site
* existing and future demands on traffic circulation
* modes of transportation.

It attempts to understand and work with the parameters laid out by planning policy or alternative parameters to which the development may acquire optimum benefits and determine the resultant options.

4.3 FEASIBILITY STUDY

Landuse options are evaluated through planning parameters, development expenditure, income, and investment returns. The system accepts singular or a multiplicity of developments and landuses that are assessed from the sensitivity analysis. A single site to the size of entire township with all disparate and operative landuses can be evaluated in terms of practicality and performance. The formation and appraisal of development options are as important as the returns that are achieved. The principle concerns are unilateral and interconnected. Variable ratios, values, and potential design configuration can be tested prior to solutions and conclusions been reached.

4.4 TOWNSHIP DEVELOPMENT

A process for appraisal and establishment of scenarios pertaining to group development on a vacant or partially developed parcel of land is explored in this sub model. This appraisal process seeks to provide interpretation to the diversity of development options within physical and economic criteria. The question of the appropriate landuse is also an important element of this sub-model analysis.

Intrinsic to this analysis are the principles outlined in the urban design sensitivity analysis pertaining to scale, access, etc. The comparatives in terms of development options and parameters are evaluated prior to any design processing takes place. Planning parameters on the one hand, and architectural elements in terms of size and prototype are evaluated against each other and against other parameters.

Returns and residual land values are obtained for each development type as to provide for the feasibility and performance of each scenario.

It further assists in the establishment of a development framework upon which the decision making process pertaining to township development can be validated at a preliminary stage.

4.5 PHASING DEVELOPMENT APPRAISAL

With the development of the township model to explore scenarios, the necessity to articulate the development strategy within physical and economic criteria for each scenario is evaluated.

Sub-scenarios are created to detail the process of development. Phasing of the development is explored as to ascertain which is the optimum development program to be followed. Cognizance is taken of the numerous players who could be involved with respect to investment.

4.6 DEVELOPMENT SUMMATION

This model provides for a synthesis of information obtained through the processes and resultant analysis derived from a collection of models in the system.
The model is structured under concerns relating to PLANNING, ARCHITECTURE, URBAN DESIGN, and ECONOMIC aspects salient to urban development.
A 'CHECKLIST' format is utilized accepting data from any model pertaining to all landuse and related values. The data is transferred on call and located at the relevant cell. This summary sheet is important as it consolidated data from various components of the system which allows for comparative appraisal to be undertaken. Directives, recommendations, and implementation strategies can be formulated after appraisal process is completed.

4.7 DEVELOPMENT STRATEGY

The role of this model is to document and evaluate the redevelopment and or the upgrading of existing structures, townships, or individual precincts in the urban or suburban realm, and the same for new development. Development strategy includes PLANNING PARAMETERS, ARCHITECTURAL RESPONSE, URBAN DESIGN INITIATIVES, and FINANCIAL PERFORMANCE as the principle criteria for evaluation. The process involves or has the capacity to provide documentation of each individual erf (developed or undeveloped) and its related status to sub-criteria established within the confines of the above criteria.

Opportunity through subdivision, consolidation, or syndication arrangements of erven are examined on the one level, and policy (if any) on existing and future rights and zoning on the other. A synchronized development with emphasis on both public and private benefits, and aesthetic and functional conditions are considered.

4.8 FACADE WITH URBAN INTERFACE

This model examines the relationship of cost to material that is applied to enclose buildings and structures.

The process is essentially based on deterministic formulations with evaluation of various cost implications that are related to the diversity of available cladding materials.

This is beneficial for budgeting and motivation purposes, as 'visions' of streetscapes which assimilate the fabric and nature of a street environment can be more accurately addressed.

Upgrading of buildings with street frontages can be tested with options provided through an overlay process, whilst a significant understanding with regards issues of affordability and acceptability of concept and design can be achieved.

Orientation and air-conditioning (if applicable) are also considered, but do not form part of this model, but included rather as a specialist sub-model to be operated by experts in that field. Thus an integrated approach that incorporates professional from another disciplines is established.

4.9 CASHFLOW PROJECTIONS

Cashflow projections are very particular and subjective component of evaluation. The financial status pertaining to each individual project and development differ, and thus group, or syndication of developments vary within each scenario. This model doe snot form part of the main line of the model or this paper, but rather is seen as a sub-model that can provide a more detailed financial report to motivate for either private or public feasibilities.

E N D N O T E S

1. Sommer, quoted in Shirvani, H. The Urban Design Process, Van Nostrand Reinhold Company,inc. 1985, pp 63.
2. Chadwick, G. Op cit., p 126.
3. Shirvani, Op cit,. p 124.
4. Ibid,. p 125.
5. Ibid,. p 126.
6. Ibid,. p 126.
7. Urban Design Plan of San Francisco,1970: 3-11 quoted in Shirvani.ibid,. p122
8. Lynch, D. quoted in ibid,. p118
9. Ibid,. p 118.
10. Ibid,. p 118.
11. Urban Design Plan of San Francisco,1970: 21 quoted in ibid,. p122.

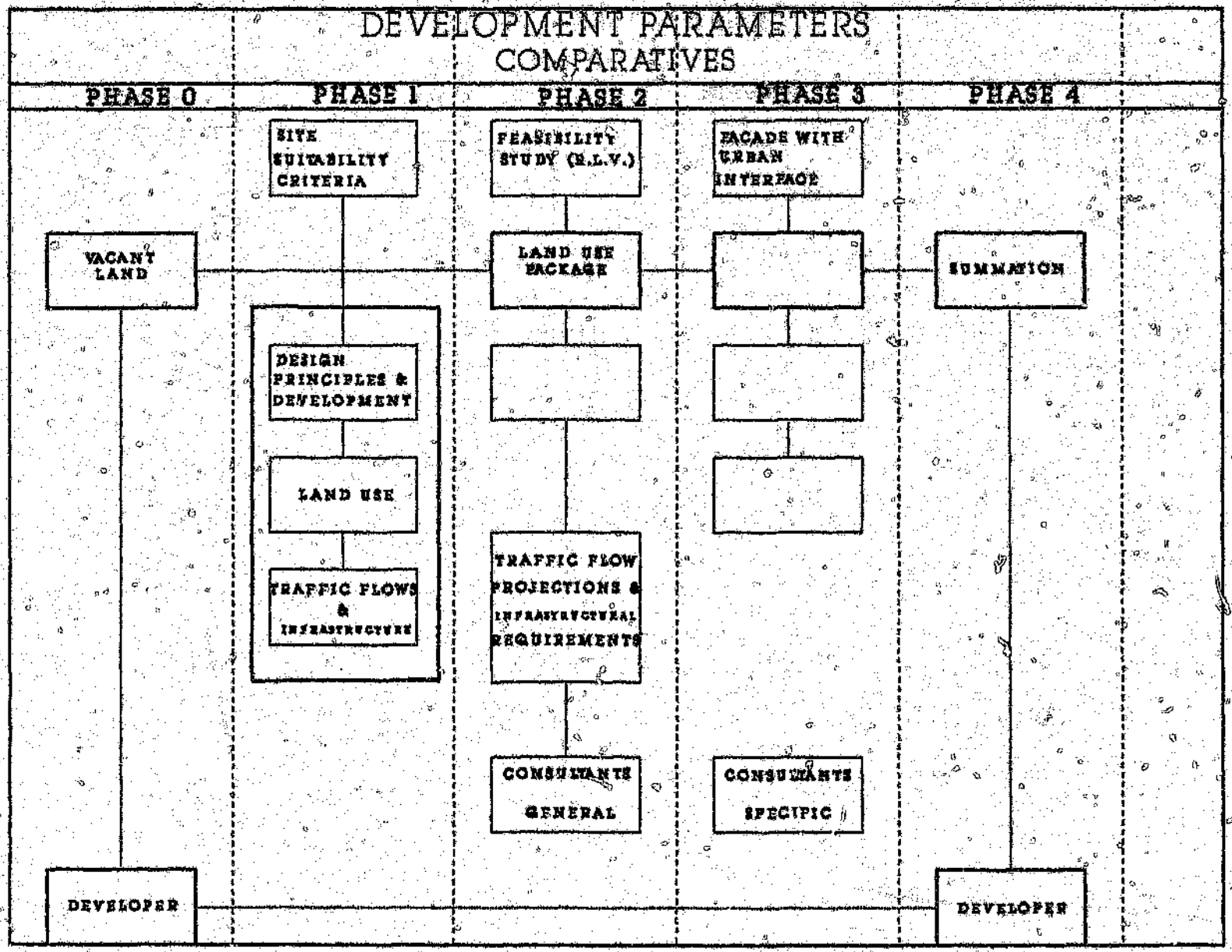
RESOLUTION AND DIRECTION

Solutions to urban problems tend to be characteristically simple, ambiguous, and static. This is in sharp contrast to the complexity of the city in which problems are often poorly stated, misunderstood, complexily interrelated, and changing over time.

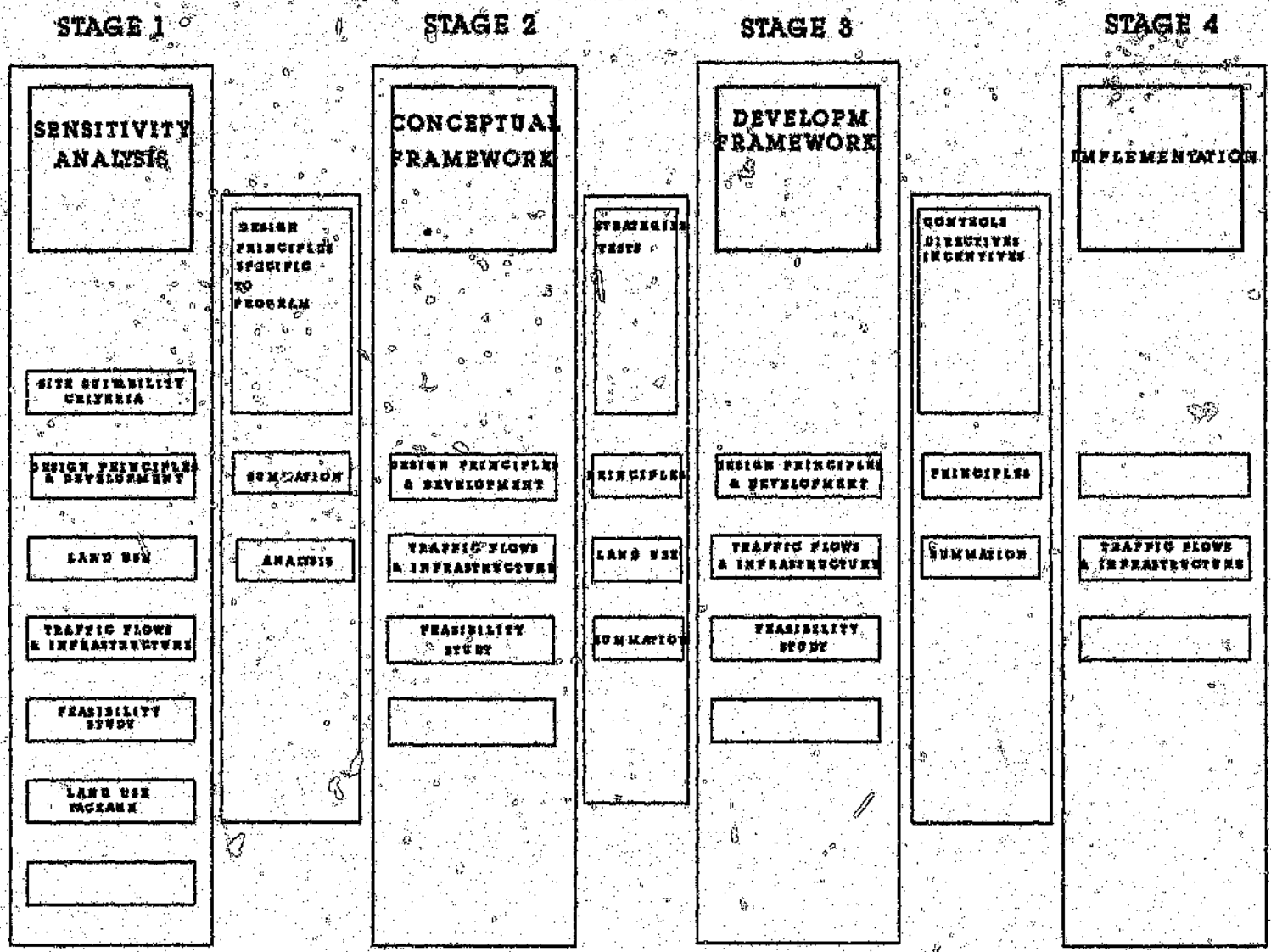
The city has long suffered from oversimplified approaches to design intervention including the dictates of engineering and blanket two dimension planning solutions. This model must not form part of this from the other side. A balanced approach, utilizing criteria and principles intfinsic to physical planning, engineering, architecture and urban design where they are most suited, seems to be most effective method for problems and urban processes facing our cities in the future.

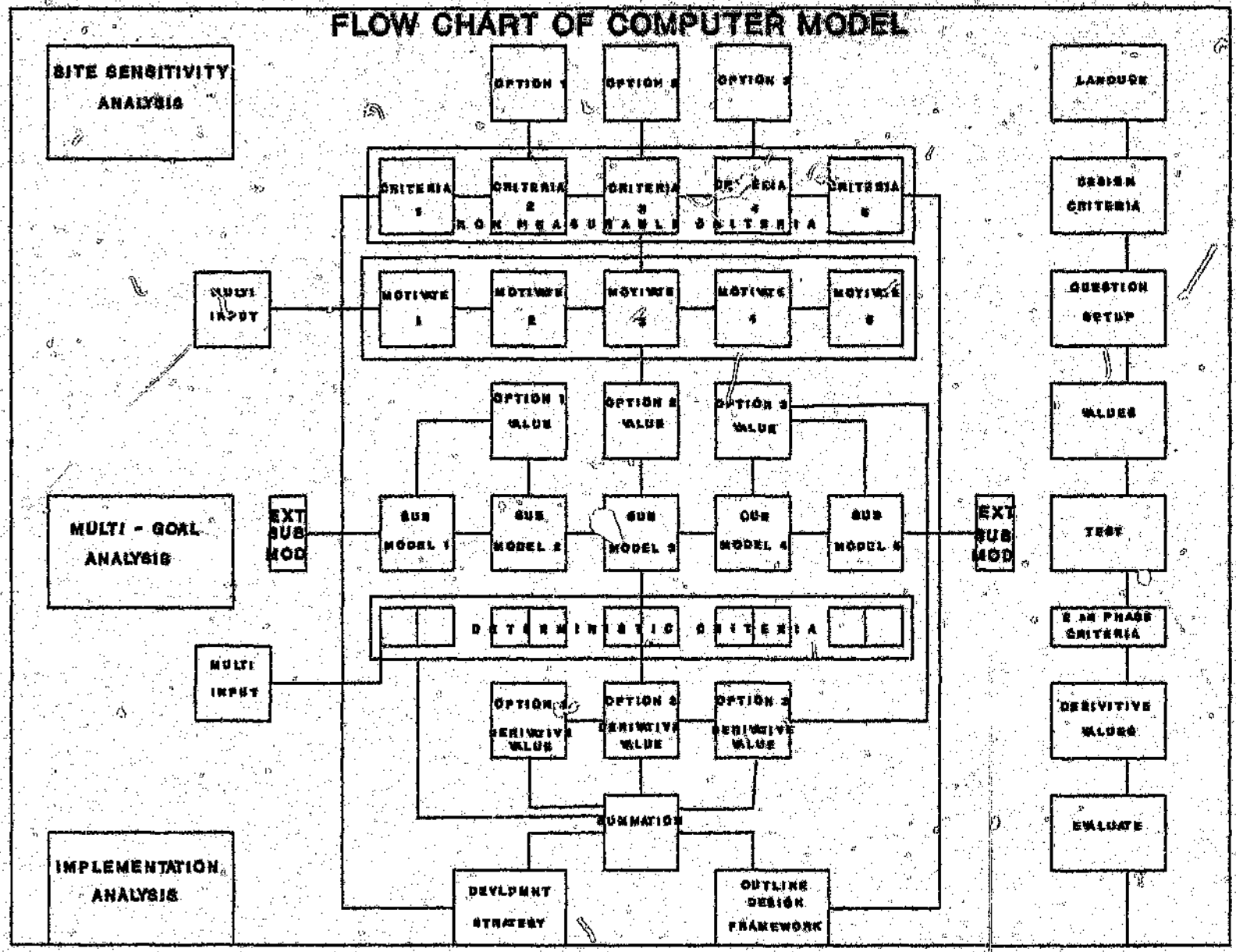
Modelling is thus an appropriate way in which to summarize the complexity of often very complex systems(urban realm) ; modelling of any such systems has the objective of making them more accessible to understanding, and subsequently to the possibility of their manipulation.

CHAPTER 5


DEVELOPMENT PARAMETERS
COMPARATIVES
PHASE 0
PHASE 1
PHASE 2
PHASE 3
PHASE 4
SITE SUITABILITY CRITERIA
FEASIBILITY STUDY (R.L.V.)
FACADE WITH URBAN INTERFACE
VACANT LAND
LAND USE PACKAGE
SUMMATION
DESIGN PRINCIPLES & DEVELOPMENT
LAND USE
TRAFFIC FLOWS & INFRASTRUCTURE
TRAFFIC FLOW PROJECTIONS & INFRASTRUCTURAL REQUIREMENTS
CONSULTANTS GENERAL
CONSULTANTS SPECIFIC
DEVELOPER
DEVELOPER

DESIGN PARAMETERS
PHASING




FLOW CHART OF COMPUTER MODEL
SITE SENSITIVITY ANALYSIS
OPTION 1
OPTION 2
OPTION 3
LANGUAGE
CRITERIA 1
CRITERIA 2
CRITERIA 3
CRITERIA 4
CRITERIA 5
NON MEASURABLE CRITERIA
DESIGN CRITERIA
MULTI INPUT
MOTIVATE 1
MOTIVATE 2
MOTIVATE 3
MOTIVATE 4
MOTIVATE 5
QUESTION SETUP
OPTION 1 VALUE
OPTION 2 VALUE
OPTION 3 VALUE
VALUES
MULTI - GOAL ANALYSIS
EXT SUB MOD
SUB MODEL 1
SUB MODEL 2
SUB MODEL 3
SUB MODEL 4
SUB MODEL 5
EXT SUB MOD
TEST
DETERMINISTIC CRITERIA
MULTI INPUT
OPTION 1 DERIVITIVE VALUE
OPTION 2 DERIVITIVE VALUE
OPTION 3 DERIVITIVE VALUE
DERIVITIVE VALUES
SUMMATION
EVALUATE
IMPLEMENTATION ANALYSIS
DEVLPMNT STRATEGY
OUTLINE DESIGN FRAMEWORK

SITE SENSITIVITY ANALYSIS MODEL

urban design S C A L E	P E R F O R M A N C E					as is	res comm	comm/ retai	auto town	offi
	I1	I2	I3	I4	I5		1	2	3	4	5
does this devlpmnt type accept the concept of scale	IE	IE	IB	IC	IB		69	69	66	67	66
is scale relevant to this development type	IE	IE	IA	ID	IB		69	69	65	68	66
is scale suitable for this development type	IE	IE	IA	ID	IB		69	69	65	68	66
is it feasible for scale in this development type	IE	IE	IC	ID	IB		69	69	67	68	68
does this develpmnt type contribute to scale	IE	IE	IB	IC	IB		69	69	66	67	66
TOTAL	I1	I2	I3	I4	I5		69	69	66	68	66

urban design S E N S I T I V I T Y	P E R F O R M A N C E					as is	res comm	comm/ retai	auto town	offi
	I1	I2	I3	I4	I5		1	2	3	4	5
is there a demand for sensitivity in this dvlpmnt	IE	ID	IB	IB	IB		69	68	66	66	66
is there relevance for sensitivity in this dvlpmnt	IE	ID	IA	IB	IB		69	68	65	66	66
is it suitable for sensitivity in this dvlpmnt	IE	ID	IB	IB	IB		69	68	66	66	66
is it feasible for sensitivity in this dvlpmnt	IE	IE	IB	IC	IC		69	69	66	67	67
does this develpmnt type contribute to sensitivity	IE	ID	IB	IB	IB		69	68	66	66	66
TOTAL	I1	I2	I3	I4	I5		69	68	66	66	66

urban design I N T E R G R A T I O N	P E R F O R M A N C E					as is	res comm	comm/ retai	auto town	offi
	I1	I2	I3	I4	I5		1	2	3	4	5
is there a demand for interg in this development type	ID	ID	IA	IB	IB		68	68	65	66	66
is there relevance for inter in this development type	ID	ID	IA	IB	IB		68	68	65	66	66
is it suitable for intergrat in this development type	ID	ID	IA	IC	IC		68	68	65	67	67

urban design CONTROLS	PERFORMANCE 1	2	3	4	5	as is	res comm 1	comm/ retai 2	noto town 3	offi 4	5
does this devlpmnt type accept the concept of control	D	D	C	B	B		68	68	67	66	66
are controls relevant to this development type	D	D	D	D	D		68	68	68	68	68
are controls suitable to this development type	D	D	D	D	D		68	68	68	68	68
are controls feasible to this development type	D	C	C	C	C		68	67	67	67	67
would controls contribute to this development type	C	B	D	D	D		67	66	68	68	68
TOTAL	1	2	3	4	5		68	67	68	67	67

urban design ORIENTATION	PERFORMANCE 1	2	3	4	5	as is	res comm 1	comm/ retai 2	noto town 3	offi 4	5
is there a demand for orientation in this dvlpmnt	D	D	D	D	D		68	68	68	68	68
is orientation relevant in this devlpmnt type	D	C	B	B	B		68	67	66	66	66
is it suitable for this dvlpmnt type to have orienta	D	D	C	B	C		68	68	67	66	67
is it feasible for this dvlpmnt type to have orienta	D	D	D	D	D		68	68	68	68	68
does this dvlpmnt type contribute to orientation	B	B	E	C	B		66	66	69	67	66
TOTAL	1	2	3	4	5		68	67	68	67	67

urban design LANDSCAPE	PERFORMANCE 1	2	3	4	5	as is	res comm 1	comm/ retai 2	noto town 3	offi 4	5
is there a demand for lansca in this development type	D	C	A	A	C		68 5	67	65	65	67
is landscaping relevant in this development type	E	D	A	A	C		69 5	68	65	65	67
is landscaping suitable	E	E	C	C	D		69	69	67	67	68

for visual interest					
is it feasible for this devl to be of visual interest	D	D	D	D	D
does this dvlpmnt type contribute to visual interes	B	C	D	B	C
TOTAL	11	12	13	14	15

68	68	68	68	68
66	67	68	66	67
67	67	68	67	68

urban design AMENITY/ COMFORT	PERFORMANCE				
	11	12	13	14	15

as is	res comm	comm/ retai	auto town	offi
1	2	3	4	5

is there a demand for such amenity and comfort	E	D	E	B	
is there relevance for such amenity and comfort	C	E	A	E	B
is it suitable for this dvlp type to provide amenity/comf	C	C	D	A	
is it feasible for this dvlp type to provide amenity/comf	C	C	B	C	B
does this dvlpmnt contribute to amenity and comfort	C	B	C	B	B
TOTAL	11	12	13	14	15

69	69	66	69	66
67	69	65	69	66
67	67	67	68	65
67	67	66	67	66
67	66	67	66	66
67	68	66	68	66

urban design ARCHITECTURAL RESPONSE	PERFORMANCE				
	11	12	13	14	15

as is	res comm	comm/ retai	auto town	offi
1	2	3	4	5

does this type of dvlpmnt demand an architectural resp	D	D	C	D	D
is an architectural response relevant to this dvlpmnt typ	C	D	D	B	D
is a suitable arch response possible in this dvlpmnt typ	D	D	D	D	D
is an architectural response feasible for this dvlpmnt ty	D	D	D	D	D
does this dvlpmnt contribute to an architectural response	C	C	C	B	D
TOTAL	11	12	13	14	15

68	68	67	66	68
67	68	68	66	68
68	68	68	68	68
68	68	68	68	68
67	67	67	66	68
68	68	68	67	68

CHARACTER	1	2	3	4	5
is there a demand for character in this dvlpmnt ty	D	D	C	B	B
is it relevant for this dvlpmnt type to have charact	D	D	C	B	B
is it suitable for this dvlpmnt type to have charact	E	D	C	B	B
is it feasible for this dvlpmnt type to have character	E	E	C	C	C
does this dvlpmnt type contribute to character	E	D	C	C	B
TOTAL	1	2	3	4	5

	comm 1	retai 2	town 3	4	5
	68	68	67	66	66
	68	68	67	66	66
	69	68	67	66	66
	69	69	67	67	67
	69	68	67	67	66
	69	68	67	66	66

urban design VIEW FROM THE ROAD	PERFORMANCE 1	2	3	4	5
is there a demand for this dvlpmnt to be viewed fro	B	D	E	D	D
is there relevance for this dvlpmnt to be viewed fro	C	D	E	D	C
is it suitable for this dvlpmnt to be viewed from th	D	D	D	B	B
is it feasible for this dvlpmnt to be viewed from th	D	D	D	D	D
does it contribute to the view from the road	D	B	D	D	C
TOTAL	1	2	3	4	5

as is res comm/ mixed offi comm retai town 1	2	3	4	5
66	68	69	68	68
67	68	69	68	67
67	68	68	66	66
68	68	68	68	68
66	66	68	68	67
67	68	68	68	67

urban design VISUAL INTEREST	PERFORMANCE 1	2	3	4	5
does this dvlpmnt type demand visual interest	C	C	D	B	B
is visual interest relevant to this dvlpmnt type	C	C	D	C	B
is this dvlpmnt type suitabl	C	C	C	C	C

as is res comm/ mixed offi comm retai town 1	2	3	4	5
67	67	68	66	68
67	67	68	67	68
67	67	67	67	67

is it feasible to intergrate in this devplopment type	E	E	B	B	C		69	69	66	66	67
does it contribute to interg in this devplopment type	D	D	A	B	B		68	68	65	66	66
TOTAL	11	12	13	14	15		68	68	65	66	66

urban design DESIRABILITY	PERFORMANCE					as is	res	comm/ retai	moto town	offi
	11	12	13	14	15	1	2	3	4	5
is there a demand for desirability in this dvlpant	D	D	D	B	D				66	68
is there relevance for this dvlpant type to be desirable	D	D	D	B	D			68	66	68
is it suitable for thi dvlpant type to be desirable	D	D		B	D		68	68	66	68
is it feasible for this dvlpant type to be desirable	D	D	D	C	D		68	68	67	68
does this dvlpant type contribute to desirability	D	D	D	A	C		65	68	68	65	67
TOTAL	11	12	13	14	15		68	68	68	66	68

urban design IDENTITY	PERFORMANCE					as is	res	comm/ retai	moto town	offi
	11	12	13	14	15	1	2	3	4	5
does this dvlpant type demon identity	C	C	E	C	D		67	67	69	67	68
is it relevant for this dvlpant type to have identit	C	C	E	C	D		67	67	69	67	68
is it suitable for this dvlpant type to have identit	D	D	D	D	D		68	68	68	68	68
is it feasible for this dvlp type to have identity	D	D	D	D	D		68	68	68	68	68
does this dvlpant type contribute to identity	D	C	D	B	C		68	67	68	66	67
TOTAL	11	12	13	14	15		68	67	68	67	68

urban design	PERFORMANCE	as is	res	comm/	moto	offi

urban design LANDSCAPE	PERFORMANCE					as is	res comm	com/ retai	moto town	offi
	1	2	3	4	5	1	2	3	4	5
is there a demand for lansca in this development type	D	C	A	A	C	68 5	67	65	65	67
is landscaping relevant in this development type	E	D	A	A	C	69 5	68	65	65	67
is landscaping suitable in this development type	E	E	C	C	D	69 5	69	67	67	68
is landscaping feasible in this development type	E	E	C	B	C	69 50	69	67	66	67
does this dvlpmnt type contribute to landscaping	E	D	A	A	C	69 69	68	65	65	67
TOTAL	1	2	3	4	5	69	68	66	66	67

urban design ROBUST & FLEXIBILITY	PERFORMANCE					as is	res comm	com/ retai	moto town	offi
	1	2	3	4	5	1	2	3	4	5
is robustness & flexibility accessable in this devlpmnt	D	D	B	D	B	68 5	68	66	68	66
is robustness & flexibility relevant in this devlpmnt ty	D	D	A	C	B	68 5	68	65	67	66
is robustness & flexibility suitable in this devlpmnt ty	C	D	A	C	B	67 5	68	65	67	66
is robustness & flexibility feasible in this devlpmnt ty	D	D	B	D	C	69 50	68	66	68	67
does this devlpmnt type cont towards flexibility & robust	D	D	B	B	C	68 68	68	66	66	67
TOTAL	1	2	3	4	5	68	68	66	67	66

urban design DISTRICT CONTRIBUTION	PERFORMANCE					as is	res comm	com/ retai	moto town	offi
	1	2	3	4	5	1	2	3	4	5
is there a demand in the area for this development type	C	E	A	E	B	67 5	69	65	69	66
is this dvlpmnt type relevant for the area	C	E	B	E	A	67 5	69	66	69	65
is this dvlpmnt type suitable for the area	C	E	A	E	A	67 5	69	65	69	65

is robustness & flexibility	10	1D	1B	1D	1C		68	68	66	68	67
feasible in this devlpmnt ty	1	1	1	1	1		50				
does this devlpmnt type cont	1D	1D	1B	1B	1C		68	68	66	66	67
towards flexibility & robust	1	1	1	1	1		68				
TOTAL	11	12	13	14	15		68	68	66	67	66

urban design DISTRICT CONTRIB. ON	P E R F O R M A N C E					as is	res comm	comm/ retai	auto town	offi
	11	12	13	14	15	1	2	3	4	5
is there a demand in the are	1C	1E	1A	1E	1B	67	69	65	69	66
for this development type	1	1	1	1	1	5				
is this dvlpmnt type relevant for the area	1C	1E	1B	1E	1A	67	69	66	69	65
	1	1	1	1	1	5				
is this dvlpmnt type suitable for the area	1C	1E	1A	1E	1A	67	69	65	69	65
	1	1	1	1	1	5				
is this dvlpmnt type feasible for the area	1D	1E	1A	1E	1B	69	69	65	69	66
	1	1	1	1	1	50				
does this dvlpmnt type contribute to the area	1D	1D	1D	1D	1B	68	68	68	68	66
	1	1	1	1	1	67				
TOTAL	11	12	13	14	15	67	69	66	69	66

ANALYSIS MATRIX

DESIGN PRINCIPLES/DEVELOPMENT

	1	2	3	4	5	6	7	8	9	10
SCALE	69	69	66	68	66	0	0	0	0	0
SENSITIVITY	69	68	66	66	66	0	0	0	0	0
INTERPRETATION	68	68	65	66	66	0	0	0	0	0
DESIRABILITY	68	68	68	66	68	0	0	0	0	0
IDENTITY	68	67	68	67	68	0	0	0	0	0
CHARACTER	69	68	67	66	66	0	0	0	0	0
VIEWS FROM THE ROAD	67	68	68	68	67	0	0	0	0	0
VISUAL INTEREST	67	67	68	67	68	0	0	0	0	0
AMENITY/COMFORT	67	68	66	68	66	0	0	0	0	0
ARCHITECTURAL RESPONSE	68	68	68	67	68	0	0	0	0	0
CONTROLS	68	67	68	67	67	0	0	0	0	0
ORIENTATION	68	67	68	67	67	0	0	0	0	0
LANDSCAPE	69	68	66	66	67	0	0	0	0	0
ROBUST & FLEXIBILITY	68	68	66	67	66	0	0	0	0	0
DISTRICT CONTRIBUTION	67	69	66	69	66	0	0	0	0	0
	1019	1019	1003	1005	1003	0	0	0	0	0

land use VIABILITY	PERFORMANCE					as is	home office	comm/ retai	moto town	offices
	11	12	13	14	15		1	2	3	4	5
is there a demand for this development type	1A	1C	1B	1E	1B		65	67	66	69	66
is there relevance for this development type	1C	1D	1B	1E	1B		67	68	66	69	66
is it suitable for this development type	1C	1C	1B	1D	1C		67	67	66	68	67
is it feasible for this development type	1D	1D	1D	1D	1D		68	68	68	68	68
does this development type contribute to viability	1E	1E	1C	1C	1C		69	69	67	67	67
TOTAL	11	12	13	14	15		67	68	67	68	67

land use FEASIBILITY	PERFORMANCE					as is	res comm	comm/ retai	moto town	offi
	11	12	13	14	15		1	2	3	4	5
is there a demand for this development type	1D	1D	1B	1D	1B		68	68	66	68	66
is there relevance for this development type	1C	1C	1B	1D	1A		67	67	66	68	65
is it suitable for this development type	1E	1E	1A	1D	1C		69	69	65	68	67
is it feasible for this development type	1E	1E	1A	1D	1B		69	69	65	68	66
does this development type contribute to feasibility	1D	1D	1B	1E	1B		68	68	66	69	66
TOTAL	11	12	13	14	15		68	68	66	68	66

land use LOCATION	PERFORMANCE					as is	res comm	comm/ retai	moto town	offi
	11	12	13	14	15		1	2	3	4	5
is there a demand for locati in this development type	1C	1C	1C	1C	1C		67	67	67	67	67
is there relevance for locati in this development type	1C	1a	1e	1e	1E		67	97	101	101	69
is it a suitable location for this development type	1B	1C	1A	1E	1A		66	67	65	69	65

is it a feasible location for this development type	1C	1C	1B	1E	1B		67	67	66	69	66
contribute development type	1B	1B	1B	1D	1C		66	66	66	68	67
TOTAL	11	12	13	14	15		67	73	73	75	67

land use LETABILITY	PERFORMANCE					as is	res conm/ retai	moto town	offi	
	11	12	13	14	15	1	2	3	4	5
is there a demand for this development type	1C	1E	1C	1D	1B	67	69	67	68	66
is there relevance for this development type	1C	1E	1C	1E	1A	67	69	67	69	65
is it suitable for letability for this dvlpmt	1B	1D	1A	1D	1A	66	68	65	68	65
is it feasible for letability for this dvlpmt	1B	1D	1B	1E	1D	66	68	66	69	66
does it contribute to letability for this dvlpmt	1B	1D	1A	1D	1B	66	68	65	68	66
TOTAL	11	12	13	14	15	66	68	66	68	66

land use ACCESS AND CIRCULATION	PERFORMANCE					as is	res conm/ retai	moto town	offi	
	11	12	13	14	15	1	2	3	4	5
is a&c a demand for this development type	1E	1D	1A	1A	1B	69	68	65	65	66
is a&c relevance for this development type	1C	1C	1C	1C	1C	67	67	67	67	67
is a&c suitable for this development type	1E	1E	1C	1D	1D	69	69	67	68	68
is a&c feasible for this development type	1E	1E	1B	1C	1C	69	69	66	67	67
does a&c contribute to this development type	1C	1D	1C	1D	1C	67	68	67	68	67
TOTAL	11	12	13	14	15	68	68	66	67	67

land use	PERFORMANCE	as is	res conm/	moto	offi

FLEXIBILITY	1	2	3	4	5
is there a demand for flexibility in this dvlpmnt	E	D	C	C	C
is there relevance for flexibility in this dvlpmnt	D	D	C	C	C

	comm 1	retai 2	town 3	4	5
	69	68	67	67	67
	68	68	67	67	67

is it suitable for flexibility in this dvlpmnt	D	D	B	C	B
is it feasible for flexibility in this dvlpmnt	E	D	B	C	B
does it contribute to flexibility in this dvlpmnt	E	D	A	D	B
TOTAL	1	2	3	4	5

	68	68	66	67	66
	69	68	66	67	66
	69	68	65	68	66
	69	68	66	67	66

land use PARKING	PERFORMANCE 1	2	3	4	5
is there a demand for parking in this development type	E	D	A	B	B
is there relevance for parking in this development type	D	C	A	B	B
is it suitable for parking in this development type	E	D	C	C	C
is it feasible for parking in this development type	E	E	C	D	D
does it contribute to parking in this development type	E	D	A	C	C
TOTAL	1	2	3	4	5

as is res comm/ retai 1	2	3	4	5
69	68	65	66	66
68	67	65	66	66
69	68	67	67	67
69	69	67	68	68
69	68	65	67	67
69	68	66	67	67

land use VISIBILITY	PERFORMANCE 1	2	3	4	5
is there a demand for visibility in this dvlpmnt t	D	D	E	C	D
is there relevance for visibility in this dvlpmnt t	C	C	C	C	C
is it suitable for	B	D	C	C	B

as is res comm/ retai 1	2	3	4	5
66	68	69	67	68
67	67	67	67	67
66	68	67	67	66

visibility in this dvlpmnt t										
is it feasible to obtain visibility in this dvlpmnt t	B	D	D	D	C	66	68	68	68	67
does it contribute to visibility in this dvlpmnt t	B	C	C	C	C	66	67	67	67	67
TOTAL	1	2	3	4	5	66	68	68	67	67

land use IMAGEABILITY	PERFORMANCE					as is	res comm	comm/ retai	moto town	offi
	1	2	3	4	5	1	2	3	4	5

is there a demand for imagea for this development type	B	C	D	A	D	66	67	68	65	68
is there relevance for image for this development type	C	C	D	B	D	67	67	68	66	68
is it suitable for imageabil for this development type	B	C	B	E	A	66	67	68	69	65
is it feasible to obtain ima for this development type	C	D	C	E	B	67	68	67	69	66
does it contribute to imagea for this development type	D	D	D	B	C	68	68	68	66	67
TOTAL	1	2	3	4	5	67	67	67	67	67

land use COMPATIBILITY	PERFORMANCE					as is	res comm	comm/ retai	moto town	offi
	1	2	3	4	5	1	2	3	4	5

is there a demand for compatibility in this dvlpmn	D	C	A	B	C	68	67			67
is there relevance for compatibility in this dvlpmn	D	D	B	A	C	68	68	66	65	67
is it suitable for compatibility in this dvlpmn	E	D	A	B	C	69	68	65	66	67
is it feasible for compatibility in this dvlpmn	E	D	B	B	C	69	68	66	66	67
does it contribute to compatibility in this dvlpmn	E	E	A	A	D	69	69	65	65	66
TOTAL	1	2	3	4	5	69	68	65	66	67

land use PRESENT POLICY	PERFORMANCE					as in res comm/ mxtu offi comm retai town				
	1	2	3	4	5	1	2	3	4	5
are there pressures on p. pol for this development type	B	E	A	B	A	66	69	65	68	65
is there relevance in p. pol for this development type	E	E	A	C	A	69	69	66	67	65
is it suitable for p. policy to incl this development typ	B	D	B	E	A	65	68	66	69	65
is it feasible for p. policy to accept this development t	E	E	B	E	B	69	69	66	69	66
does this development type contribute to present policy	E	E	A	B	A	69	69	65	66	65
TOTAL	1	2	3	4	5	68	69	65	68	65

KENSINGTON 'B' RANDBURG

ANALYSIS MATRIX — LANDUSE

	1	2	3	4	5	6	7	8	9	10
VIABILITY	67	68	67	68	67	0	0	0	0	0
FEASIBILITY	68	68	66	68	66	0	0	0	0	0
LOCATION	67	78	73	75	67	0	0	0	0	0
LETABILITY	66	68	65	68	66	0	0	0	0	0
ACCESS AND CIRCULATION	68	68	66	67	67	0	0	0	0	0
FLEXIBILITY	67	68	65	67	66	0	0	0	0	0
PARKING	69	68	66	67	67	0	0	0	0	0
VISIBILITY	66	68	69	67	67	0	0	0	0	0
IMAGEABILITY	67	67	67	67	67	0	0	0	0	0
COMPATIBILITY	69	68	65	66	67	0	0	0	0	0
PRESENT POLICY	68	69	65	68	65	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	743	753	735	748	731	0	0	0	0	0

KENSINGTON B RANDBURG

traffic & infra PUBLIC PARKING	PERFORMANCE 1	2	3	4	5	as is home office	comm/ retail	moto town	offices 1	2	3	4	5
is there a demand for pblc parking in this dvlpmt type	E	C	A	B	B				69	67	65	66	66
is there relevance for pblc parking in this dvlpmt type	E	C	A	B	B				69	67	65	66	66
is it suitable for pblc parking in this dvlpmt type	E	C	B	C	C				69	67	66	67	67
is it feasible for public parking in this dvlpmt type	E	D	B	C	C				69	68	66	67	67
does the dvlpmt type contrib to the need for public prkng	E	C	A	B	B				69	67	65	66	66
TOTAL	1	2	3	4	5				69	67	65	66	66

traffic & infra PRIVATE PARKING	PERFORMANCE 1	2	3	4	5	retai dvlp	retailcomm comm	home dvlp	ptrol office	garge 1	2	3	4	5
is there a demand for priv parking in this dvlpmt type	E	C	C	C	B					69	67	67	67	66
is there relevance for priv parking in this dvlpmt type	E	C	D	C	B					69	67	68	67	66
is it suitable for private parking in this dvlpmt type	E	D	C	C	C					69	68	67	67	67
is it feasible for private parking in this dvlpmt type	E	D	C	C	C					69	68	67	67	67
does the dvlpmt type contrib to the need for priv prkng	E	D	D	C	B					69	67	68	67	66
TOTAL	1	2	3	4	5					69	67	67	67	66

traffic & infra No of PARKING BAYS over fifty bays	PERFORMANCE 1	2	3	4	5	retai dvlp	retailcomm comm	home dvlp	ptrol office	garge 1	2	3	4	5
is there a demand for p bays in this development type	D	D	B	D	B					68	68	66	67	66
is there relevance for p bay in this development type	D	D	B	C	B					68	68	66	67	66
is it suitable for p bays in this development type	D	D	B	C	B					68	68	66	67	66
is it feasible for p bays in this development type	E	D	C	D	D					69	68	67	68	68

does the dvlpmt type contrib to the need for prkng bays	E	D	A	C	B
TOTAL	1	2	3	4	5

	retai dvlp	retail comm	home dvlp	ptrol offce	garge
	1	2	3	4	5
	69	68	65	67	66
	68	68	66	67	66

traffic & infra ACCESS/EGRESS-SITE	PERFORMANCE 1	2	3	4	5
is there a demand for major a&e in this dvlpmnt type	D	D	B	C	C
is there relevance for major a&e in this dvlpmnt type	D	D	B	C	C
is it suitable for major a&e in this dvlpmnt type	D	D	B	D	C
is it feasible for major a&e in this dvlpmnt type	D	D	B	D	C
does it contribute to major a&e in this dvlpmnt type	D	D	B	C	C
TOTAL	1	2	3	4	5

	retai dvlp	retail comm 2	home dvlp 3	ptrol offce 4	garge 5
	68	68	66	67	67
	68	68	66	67	67
	68	68	66	68	67
	68	68	66	67	67
	68	68	66	67	67
	68	68	66	67	67

traffic & infra PEDESTRIAN ACTIVITY	PERFORMANCE 1	2	3	4	5
is there a demand for ped ac in this development type	C	B	D	C	B
is there relevance for ped a in this development type	D	C	D	C	B
is it suitable for ped actv in this development type	C	C	C	C	C
is it feasible for ped actv in this development type	D	D	D	D	D
does the dvlpmnt type contri to pedes activity	B	B	D	C	B
TOTAL	1	2	3	4	5

	retai dvlp	retail comm	home dvlp	ptrol offce	garge
	1	2	3	4	5
	67	66	68	67	66
	68	67	68	67	66
	67	67	67	67	67
	68	68	68	68	68
	66	66	68	67	66
	67	67	68	67	67

traffic & infra TRAFFIC CIRCULATION	PERFORMANCE 1	2	3	4	5
is there a demand for traff circ in this dvlpmnt t	B	B	A	B	C
is there relevance for traff circ in this dvlpmnt t	D	D	A	B	D

	retai dvlp	retail comm	home dvlp	ptrol offce	garge
	1	2	3	4	5
	69	68	65	66	67
	68	68	65	66	68

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is it suitable for traff circ in this dvlpmnt t	D	D	B	B	B	68	68	66	66	66
is it feasible for traff circ in this dvlpmnt ti	E	D	A	B	B	69	68	65	66	66
does the dvlpmnt type contri to traff circulation	E	D	A	B	B	69	68	65	66	66
TOTAL	1	2	3	4	5	69	68	65	66	67

traffic & infra FUTURE DEMAND	PERFORMANCE					retai dvlp	retailcomm	home dvlp	ptrol offce	garge
	1	2	3	4	5	1	2	3	4	5
is there a future demand in this development type	E	C	B	B	B	69	67	66	66	66
is future demand relevant in this development type	E	D	B	B	B	69	68	66	66	66
is it suitable for f demand in this development type	E	C	A	C	C	69	67	65	67	67
is it feasible for future de in this development type	E	D	C	D	D	69	68	67	68	68
does it contribute to f dema in this development type	D	C	B	C	C	68	67	66	67	67
TOTAL	1	2	3	4	5	69	67	66	67	67

traffic & infra DEVELOPMENT POPULATION	PERFORMANCE					retai dvlp	retailcomm	home dvlp	ptrol offce	garge
	1	2	3	4	5	1	2	3	4	5
is there a demand for a major devop pop in this dvlp	E	D	D	C	B	69	68	68	67	66
is there relevance for a major devop pop in this dvlp	E	D	D	C	B	69	68	68	67	66
is it suitable for a major devop pop in this dvlp	D	C	C	C	B	68	67	67	67	66
is it feasible for major devop pop in this dvlp	D	C	C	C	B	68	67	67	67	66
does it contribute to a major development population	E	B	C	C	B	69	68	67	67	66
TOTAL	1	2	3	4	5	69	68	67	67	66

traffic & infra VISITORS TO DEVELOPMENT	PERFORMANCE 1	2	3	4	5	retai dvlp 1	retailcomm comm 2	home dvlp 3	ptrol office 4	garge 5
KENSINGTON B RANDBURG										
is there a demand for visito in this development type	E	C	A	B	B	69	67	65	66	66
is there relevance for visit in this development type	D	C	A	A	B	68	67	65	65	66
is it suitable for visitors in this development type	D	D	B	D	D	68	68	66	68	68
is it feasible for visitors in this development type	E	D	B	D	D	69	68	66	68	68
does it contribute to visito in this development type	E	D	A	C	C	69	68	65	67	67
TOTAL	1	2	3	4	5	69	68	65	67	67

traffic & infra SERVICE VEHICLES	PERFORMANCE 1	2	3	4	5	retai dvlp 1	retailcomm comm 2	home dvlp 3	ptrol office 4	garge 5
is there a demand for ser vehicles in this dvlpmnt	E	D	B	B	C	69	68	66	66	67
is there relevance for ser vehicles in this dvlpmnt	E	D	B	B	C	69	68	66	66	67
is it suitable for ser vehicles in this dvlpmnt	D	B	A	B	C	68	66	65	66	67
is it feasible for ser vehicles in this dvlpmnt	D	C	B	C	C	68	67	66	67	67
does it contribute to ser vehicles in this dvlpmnt	E	D	A	C	D	69	68	65	67	68
TOTAL	1	2	3	4	5	69	67	66	66	67

traffic & infra SERVICES	PERFORMANCE 1	2	3	4	5	retai dvlp 1	retailcomm comm 2	home dvlp 3	ptrol office 4	garge 5
is there a demand for serv in this development type	E	D	A	C	B	69	68	65	67	66
is there relevance for serv	D	C	B	C	C	68	67	66	67	67

in this development type									
is it suitable for services in this development type	D	D	B	C	C	68	68	66	67	67
is it feasible for services in this development type	D	D	B	C	C	68	68	66	67	67
does it contribute to need for services in this dvlpmt typ	D	C	B	C	C	68	67	66	67	67
TOTAL	11	12	13	14	15	68	68	66	67	67

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traffic & infra EXISTING INFRASTRUCTURE	P E R F O R M A N C E					retail dvlp 1	retail comm dvlp 2	home office dvlp 3	petrol garge 4	5
	11	12	13	14	15					
is there a demand on exist infr in this dvlpmt t	D	C	A	B	B	68	67	65	66	66
is there relevance for exist infr in this dvlpmt t	D	C	A	B	B	68	67	65	66	66
is it suitable for exist infr in this dvlpmt t	D	D	B	C	C	68	68	66	67	67
is it feasible for exist infr in this dvlpmt t	D	C	A	C	B	68	67	65	67	66
does exist infra contribute adequately for this dvlpmt	D	C	B	C	B	68	67	66	67	66
TOTAL	11	12	13	14	15	68	67	65	67	66

KENSINGTON B RANDBURG

ANALYSIS MATRIX

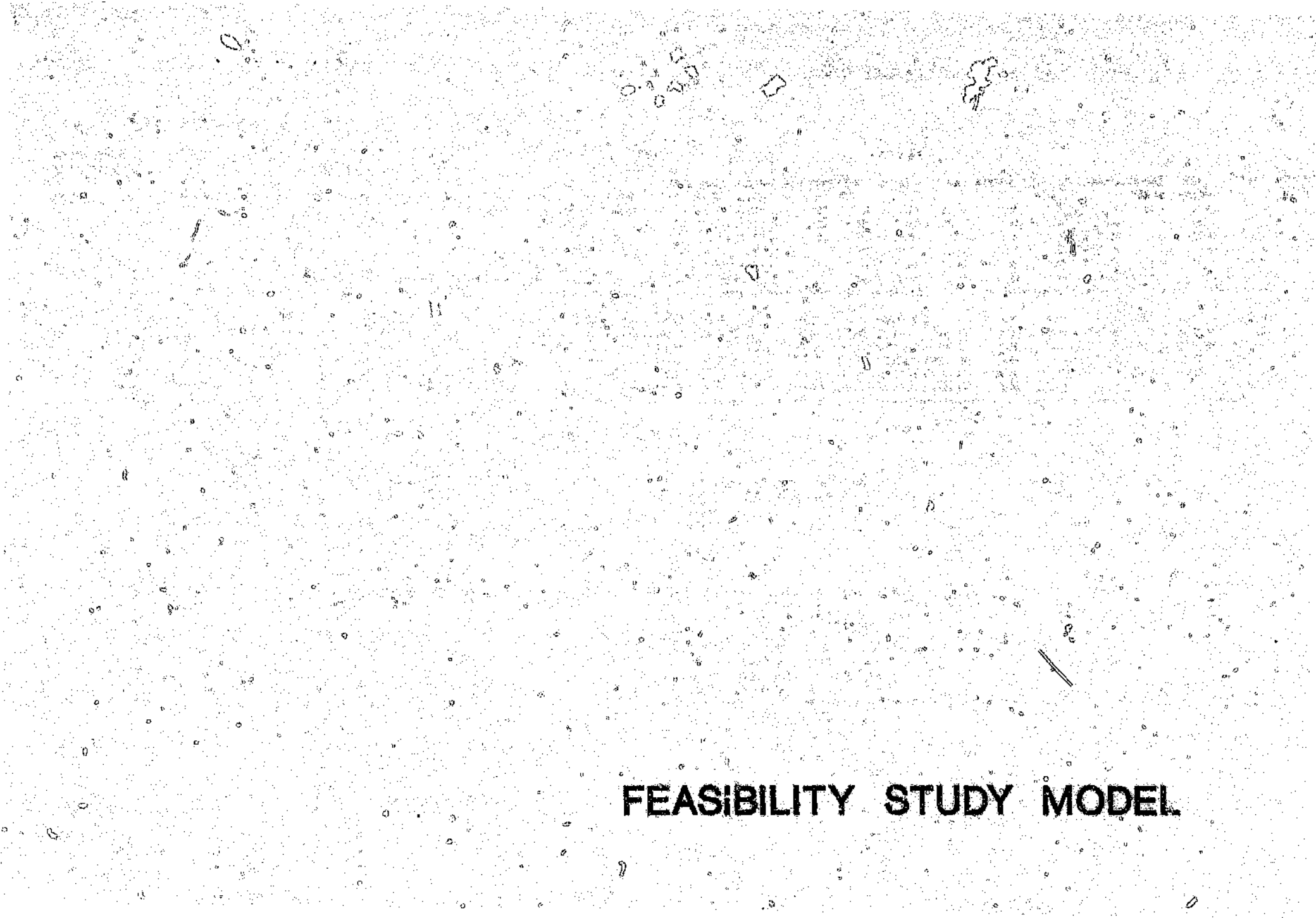
TRAFFIC & INFRASTRUCTURE

	1	2	3	4	5	6	7	8	9	10
PUBLIC PARKING	69	67	65	66	66	0	0	0	0	0
PRIVATE PARKING	69	67	67	67	66	0	0	0	0	0
No of PARKING BAYS	68	68	66	67	66	0	0	0	0	0
ACCESS/EGRESS-SITE	68	68	66	67	67	0	0	0	0	0
PEDESTRIAN ACTIVITY	67	67	68	67	67	0	0	0	0	0
TRAFFIC CIRCULATION	69	68	65	66	67	0	0	0	0	0
FUTURE DEMAND	69	67	66	67	67	0	0	0	0	0
DEVELOPMENT POPULATION	69	68	67	67	66	0	0	0	0	0
VISITORS TO DEVELOPMENT	69	68	65	67	67	0	0	0	0	0
SERVICE VEHICLES	69	67	66	66	67	0	0	0	0	0
SERVICES	68	68	65	67	67	0	0	0	0	0
EXISTING INFRASTRUCTURE	68	67	65	67	66	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	821	810	793	802	799	0	0	0	0	0

TRAFFIC AND INFRASTRUCTURE MODEL

TRAFFIC FLOW PROJECTIONS AND INFRASTRUCTURE REQUIREMENTS

	COMMERCI PROJECT SIZE sq.m			RETAIL PROJECT SIZE sq.m			COMMERC PROJECT RETAIL SIZE sq.m			RESID PROJECT RETAIL SIZE sq.m			RESID PROJECT SIZE sq.m			INDUSTR PROJECT SIZE sq.m		
	100	10000		100	5000		100	5000		100	5000		100	5000		100	5000	
P.P.D/DAY	6	600		8	400		7	350		12	600		15	750		5	250	
P.P.D/MONTH		12000			8000		140	7000			12000			15000			5000	
V.P.D/DAY	3	300		50	2500		55	2750		58	2900		10	500		3	150	
V.P.D/MONTH		6000			50000			55000			58000			10000			3000	
SV.P.DAY	1	24		3	72		5	120		6	144		1	24		8	192	
SV.P.MONTH		480			1440			2400			2880			480			3840	
NO OF BAY 28	3	300		3	150		6	300		6	300		1	50		2	100	
sq.m area		8400			4200			8400			8400			1400			2800	
area site 60%	8000	3200		12000	4800	60%	9000	2700	70%	15000	7500	50%	6000	2400	60%	25000	10000	60%
landscapi 15%		1200			1800	15%		1350	15%		2250	15%		900	15%		1250	5%
height	3			1			2			1			2			1		
covered p	2.6	6400		0.2	1200		2.6	7050		0.4	3150		-0.6	-100		-0.6	-5950	
open p 25%	71	2000		107	3000	25%	48	1350	15%	188	5250	35%	54	1500	85%	313	8750	35%
street p																		
private transport																		
PERSONS	55%	330		65.00%	260		65.00%	27.5		65.00%	390		65.00%	487.5		65.00%	162.5	
V.PERSONS	100%	300		85.00%	2125		100.00%	50		75.00%	2175		86.00%	430		100.00%	150	
public transport																		
BUS	20%	120		15.00%	60		15.00%	.5		15.00%	90		15.00%	112.5		15.00%	37.5	
MICRO BUS	5%	30		5.00%	20		5.00%	17.5		5.00%	30		5.00%	37.5		5.00%	12.5	
TRAIN	10%	60		10.00%	40		10.00%	35		10.00%	60		10.00%	75		10.00%	25	
PEDESTRIAN	10%	60		5.00%	20		5.00%	17.5		5.00%	30		5.00%	37.5		5.00%	12.5	
	1			1			1			1			1			1		
private transport																		
CARS/PERSONS	0.70	231		0.70	182		0.70	159		0.70	273		0.70	341		0.70	114	
CARS/V.PERSONS	1.00	300		1.00	2125		1.00	2750		1.00	2175		1.00	430		1.00	150	
ROAD 1																		
ACCESS/EGRESS																		
EXIST FLOWS		19567			19567			19567			19567			19567			19567	
NEW FLOWS		20098			21874			22476			22015			20335			19931	
ROAD 2																		
EXIST FLOWS		12056			12056			12056			12056			12056			12056	
NEW FLOWS	65%	12492		50%	13301		50%	13590		50%	13417		35%	12548		50%	12245	
ROAD 3																		
EXIST FLOWS		2345			2345			6345			2345			2345			2345	
NEW FLOWS	15%	2621		25%	3058		25%	3192		25%	3162		25%	2794		25%	2496	
ROAD 4																		
EXIST FLOWS		5783			5783			5783			5783			5783			5783	
NEW FLOWS	20%	6074		25%	6496		25%	6630		25%	6600		40%	6296		25%	5934	
	1			1			1			1			1			1		


FEASIBILITY STUDY MODEL

PARKWOOD/ROSEBANK
FEASIBILITY REPORT

PARAMETERS

ZONING	AREA erf no	SITE AREA sq.m	DENSITY (F.A.R) policy	DENSITY (F.A.R) actual	BULK sq.m	COVERAGE sq.m	COVERAGE % policy	COVERAGE % actual	BUILDING LINES	RESTRICTED ZONE	PARKING bays/100sq.m provided	PARKING REQUIRED
BUSINESS 1	PARKWOOD 2715	0.6	1.1	2899	1086	60%	40.06%		B.7	108	36	
BUSINESS 2	PARKWOOD 2715	0.6	1.4	3678	1358	60%	50.02%		2.7	100	75	
COMMERCIAL	PARKWOOD 2715	0.6	1.6	4273	1629	60%	60.90%		2.6	81	56	
HOME OFFIC	PARKWOOD 2715	0.6	0.3	832	832	60%	30.64%		1.0	24	14	
PERTOL BAR	PARKWOOD 2715	0.6	0.3	815	1100	60%	40.52%		1.0	24	14	
BUSINESS 2	PARKWOOD 2715	0.6	0.7	2000	1086	60%	40.00%		1.9	64	36	

INCOME

LETTABLE SPACE	LETTABLE RATIOS	COVER	PARK sq.m area	OPEN PARK no of bay	RESIDUAL AREA	RETAIL	OFFICE	INDUSTRIAL	WAREHOUSE	RESIDENTIAL	COVERED PARKING	OPEN PARKING	OTHER
	62.78%	28.09%	24	62	9.14%	50.00	28.00	0.00	0.00	1.00	120.00	65.00	9.50
	67.78%	21.97%	24	51	10.25%	50.00	28.00	0.00	0.00	1.00	150.00	85.00	9.50
	57.31%	25.98%	24	57	6.74%	50.00	28.00	0.00	0.00	1.00	150.00	85.00	9.50
	87.26%	0.00%	24	24	15.74%	50.00	15.00	0.00	0.00	1.00	0.00	65.00	9.50
	85.00%	0.00%	24	24	15.00%	50.00	28.00	25.00	12.00	1.00	0.00	95.00	2850.00
	85.00%	2.40%	24	62	12.60%	25.00	28.00	0.00	0.00	10.00	0.00	55.00	9.50
					42.49								
1.1000.00	1530.00	1104	1488.00	865.00	918000.00	514080.00	0.00	0.00	800784.00	66240.00	48360.00	30210.00	
12500.00	2125.00	1176	1224.00	277.00	637500.00	357000.00	0.00	0.00	1072512.00	88200.00	52920.00	42978.00	
12721.00	2548.90	1334	408.00	288.10	1469340.00	822830.40	0.00	0.00	1252886.40	122680.00	17340.00	38943.40	
815.00	692.75	0	576.00	139.25	415650.00	232764.00	0.00	0.00	452412.00	0.00	16785.00	19874.50	
815.00	692.75	0	576.00	188.25	415650.00	232764.00	105000.00	50400.00	523164.00	0.00	24480.00	1040250.00	
12000.00	1700.00	48	1488.00	252.00	321300.00	510000.00	0.00	0.00	102000.00	0.00	40920.00	28728.00	

EXPENDITURE

COSTS/SQ.M in RANDS	BLDG COST in RANDS	INFRASTRUCTU COSTS	LAND COST	CONSTR TIME	ESCALATION	CONSTR COSTS ON COMPLETION	CONTINGENCI	FINANCIAL CHARGES	PROF FEES	FEES IN RANDS	TOTAL EXPENDITURE
					1.00%			16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
1200	3473800.00	106880.00	1500000.00	6	208728.80	3984128.40	199720.40	877460.54	10%	398412.84	6760001.78
1200	4413600.00	88400.00	1200000.00	6	264816.00	5005158.80	238346.80	998885.07	10%	500515.68	7698497.37
1100	4706300.00	34560.00	900000.00	6	298018.00	5267721.90	250843.90	986833.10	10%	526772.19	7681329.39
1100	915200.00	88960.00	400000.00	1	34608.00	1069664.40	50936.40	235146.30	10%	106966.44	1811777.14
1000	815000.00	118700.00	3000000.00	3	24450.00	1006057.50	47907.50	660989.20	10%	100605.75	4747632.45
1200	2400000.00	106880.00	900000.00	6	144000.00	2783424.00	132544.00	589347.84	10%	278342.40	4551114.24

RETURNS

CAPITALIZATION RATE	RESIDUAL LAND VALUE	RESIDUAL LA VALUE(R/SQ.M)	LAND PRICE
13.00%			
13.00%			
12.00%			
12.00%			
13.60%			
9.60%			
8175461.54	1415459.75	521.35	1415459.75
9059215.38	1360717.82	501.19	1360717.82
8299115.00	617385.41	227.53	617385.41
8227787.50	416210.36	153.30	416210.36
7821346.15	3073713.70	1132.12	3073713.70
8477200.00	926085.76	341.10	926085.76

PARKWOOD/ROSEBANK
FEASIBILITY REPORT

PARAMETERS

ZONING	AREA erf no	SITE AREA sq.m	DENSITY (F.A.R) policy	DENSITY (F.A.R) actual	BLK sq.m	COVERAGE sq.m	COVERAGE % policy	COVERAGE % actual	BUILDING LINES	RESTRICTED ZONE	PARKING bays/100sq.m provided	PARKING REQUIRED
BUSINESS 1	PARKWOOD	2715	0.6	1.1	2899	1094	60%	40.90%		2.7	100	58
BUSINESS 2	PARKWOOD	2715	0.6	1.4	3678	1358	60%	50.02%		2.7	100	76
COMMERCIAL	PARKWOOD	2715	.6	1.6	4273	1629	60%	60.00%		2.6	81	54
HOME OFFIC	PARKWOOD	2715	.6	0.3	832	832	60%	30.64%		1.0	24	14
PETROL BAS	PARKWOOD	2715	.6	0.3	815	1100	60%	40.52%		1.0	24	14
BUSINESS 3	PARKWOOD	2715	.6	0.7	2000	1086	60%	40.00%		1.7	64	34

INCOME

LETTABLE SPACE	LETTABLE RATIOS	COVER AREA sq.m	PARK no of bay	OPEN PARK AREA	RESIDUAL	RETAIL	OFFICE	INDUSTRIAL	WAREHOUSE	RESIDENTIAL	COVERED PARKING	OPEN PARKING	OTHER
	92.78%	38.08%	24	62	5.14%	50.00	28.00	0.00	0.00	1.00	120.00	85.00	9.30
	89.78%	34.97%	24	54	10.25%	50.00	28.00	0.00	0.00	1.00	150.00	85.00	9.30
	87.31%	35.95%	24	17	6.74%	50.00	28.00	0.00	0.00	1.00	150.00	85.00	9.50
	83.25%	0.00%	24	24	16.74%	50.00	25.60	0.00	0.00	1.00	9.00	65.00	9.50
	85.00%	0.00%	24	24	15.00%	50.00	28.00	25.00	12.00	1.00	0.00	85.00	2850.00
	85.00%	2.40%	24	62	12.60%	35.00	22.00	0.00	0.00	10.00	0.00	85.00	9.50
					48.42								
11800.00	1320.00	1104	1488.00	265.00	918000.00	514080.00	0.00	0.00	800784.00	66240.00	48540.00	30210.00	
12500.00	2125.00	1176	1824.00	377.00	835500.00	357000.00	0.00	0.00	1078512.00	58200.00	58020.00	42975.00	
112231.00	2448.90	1536	408.00	298.10	1449340.00	122230.40	0.00	0.00	1252805.40	122880.00	17340.00	38843.40	
816.00	692.75	0	576.00	121.25	415650.00	238764.00	0.00	0.00	452412.00	0.00	18720.00	15974.50	
815.00	692.75	0	576.00	122.25	415650.00	238764.00	105000.00	50460.00	382164.00	0.00	24480.00	1040820.00	
12000.00	1700.00	48	1488.00	262.00	221300.00	210000.00	0.00	0.00	102000.00	0.00	40920.00	28728.00	

EXPENDITURE

COSTS/SQ.M in RANDS	BLDG COST in RANDS	INFRASTRUCTU COST	LAND COST	CONSTR TIME	ESCALATION	CONSTR COSTS ON COMPLETION	CONTINGENCI	FINANCIAL CHARGES	PROF FEES	FEES IN RANDS	TOTAL EXPENDITU
					1.00%			16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
		20.00			1.00%		5%	16.00%			
1800	3478800.00	106880.00	1500000.00	6	209728.00	3984135.40	199720.40	877460.54	10%	378412.04	8760001.78
1200	4413600.00	88400.00	1200000.00	6	266816.00	5005156.80	238340.00	998835.07	10%	506515.68	7498497.57
1100	4700300.00	34560.00	900000.00	6	282018.00	5287721.90	250843.90	986835.50	10%	526772.19	7681329.59
1100	915200.00	86920.00	400000.00	4	36608.00	1069664.40	50936.40	235146.30	10%	106966.44	1811777.14
1000	815000.00	118700.00	3000000.00	3	24450.00	1806057.50	47907.50	640969.20	10%	104605.75	4747632.45
1200	2400000.00	106880.00	700000.00	6	144000.00	2782429.00	132544.00	589347.84	10%	278242.40	4851114.24

RETURNS

CAPITALIZATION RATE	RESIDUAL LAND VALUE	RESIDUAL LA VALUE(R/SQ.M)	LAND PRICE
12.00%			
13.00%			
12.00%			
12.00%			
15.40%			
9.00%			
8175481.54	1415469.75	521.25	1415469.75
6089215.38	1360717.88	501.19	1360717.88
8899115.00	617785.41	227.58	617785.41
2827987.50	416210.26	153.30	416210.26
7821344.15	3073713.70	1132.12	3073713.70
9477204.00	926085.76	341.10	926085.76

TOWNSHIP DEVELOPMENT MODEL

TOWNSHIP DEVELOPMENT MODEL

TOWNSHIP DEVELOPMENT

	res 3 RESIDENT CLUSTERS			res 4 RESIDENT TOWNHOUSE			res 2 RESIDENT TOWNHOUSED			RESIDENT TOWNSHIP		
SITE AREA	20000	5%		50000	13%		20000	5%		15000		
CONSOLIDATION												
SUBDIVISION	377561			377561			377561					
DENSITY	60 p/hectareunits			90 p/hectareunits			60 p/hectare units					
COVERAGE	30% 87		actual	40% 70		actual	30% 131		actual	60% 528		actual
F.A.R.	0.4 5220		0.26	0.4 17500		0.35	0.4 4000		0.2	1.2 5370		0.36
P BAYS REQUIRED												
NO OF BAYS												
NO OF ERVEN	60	60		250	250		40	40		25	25	
ERF SIZE	290			175			435			880		
% ERF OF LAND	87% 17400			88% 43750			87% 17400			146% 28000		
ROADS	8% 1600			8% 3750			8% 1600			-56% -8428		
LANDSCAPING	5% 1000		150	5% 2500			5% 1000			10% 1508		
INFRASTRUCTURE												
LAND COSTS	rands	metre	r/sq.m	rands	metre	r/sq.m	rands	metre	r/sq.m	rands	metre	r/sq.m
site clearance	120000		6	350000		7	120000		6	105560		7
site terracing	0		0	0		0			0	0		0
retain walls	0	400	0	0	0	225	0	0	225	0	0	225
total	120000			350000			120000			105560		
SITE SERVICES												
hard landsc	120000		75	281250		75	120000		75	-632100		75
soft landsc	25000		25	62500		25	10000		10	200000		item
sewer reticulati	45000	300	150	270000	1800	150	37500	250	150	60000	400	150
water reticulati	45000	300	150	270000	1800	150	37500	250	150	60000	400	150
fire mains	21000	150	140	126000	900	140	0	0	140	60000	400	150
storm water	17415	129	135	38880	288	135	16605	123	135	56000	400	140
electr retic	240000	125	4000	1000000		4000	160000		4000	300000		item
walling				1.8 90000	500	100						
security				50000								
total	513415			2188630			381605			103900		
no/f.a.r/size/r/	cov f.a.r	height	size	cov f.a.r	height	size	cov f.a.r	height	size	cov f.a.r	heigh	size
PROTOTYPE 1	0.30	1	87	0.40	1	70	0.2		100	0.3		225
PROTOTYPE 2	0.30	1	87	0.40	1	70	0.2		100	0.3		250
PROTOTYPE 3	0.30	1	87	0.40	1	70	0.2		100	0.2		200
PROTOTYPE 4	0.30	1	87	0.40	1	70	0.2		100	0.2		185
c o s t/type			r/sq.m			r/sq.m			r/sq.m			r/sq.m
PROTOTYPE 1	69600		800	52500		750	75000		750	270000		1200
PROTOTYPE 2	69600		800	52500		750	75000		750	300000		1200
PROTOTYPE 3	69600		800	52500		750	75000		750	240000		1200
PROTOTYPE 4	69600		800	52500		750	75000		750	222000		1200
c o s t	no			no			no			no		
PROTOTYPE 1	15 1044000			60 3150000			10 750000			5 1350000		
PROTOTYPE 2	15 1044000			60 3150000			10 750000			7 2100000		
PROTOTYPE 3	15 1044000			60 3150000			10 750000			6 1440000		
PROTOTYPE 4	15 1044000			70 3675000			10 750000			7 1554000		
BUILDING COST	4176000			13185000			3000000			6444000		
LAND COSTS	120000			350000			120000			105560		
SITE SERVICES	513415			2188630			381605			103900		
LAND IMPR COST	4809415			15863630			3501605			6653460		
ESCALATION												
pre-contract	2 144282			2 469909			2 105048			4 399807.6		

post-contract	7	232494		10	1174778		9	182834		15	748516			
fin charges-cost	5%	883668		5%	928070		5%	203531		18%	1354844			
fin charges-land	0%	0		0%	0		0%	0		0%	0			
LOSS OF CAPITAL		4000			89259			6000			32009			
contingency	2.5%	120825		8.5%	991591		12.5%	97540						
marketing	4%	180543		4%	138038		4%	174144						
PROFESS FEES	8%	467169		8%	1253090		8%	280128.9		10%	663546			
TOTAL COSTS		6338804.	land(r/sq.m)		20243350	land(r/sq.m)		4636831.	land(r/sq.m)		9218804			
RES LAND VALUE		356268	17.81		1129787	28.39		141766	7	12%	1763365	116.9		
LAND PRICE		75000	3.75		195009	3.9		75000	3.75		100000	66.52		
SELLING PRICE														
PROTOTYPE 1	20%	112839		20%	86274		20%	121340		25%	894587			
PROTOTYPE 2		112839			86274			121340			412087			
PROTOTYPE 3		112839			86274			121340			334587			
PROTOTYPE 4		112839			86274			121340			334587			
RENTALS														
PROTOTYPE 1														
PROTOTYPE 2														
PROTOTYPE 3														
PROTOTYPE 4														
INFR/UNIT COST		10557			10155			12540			8378			
FEES/UNIT COST		7786			5012			7003			26614			
LAND/UNIT COST		1250	20409		780	17472		1875	23291		16000			
BULK CTR-PR/UNIT		344.63			887.19			344.63						
NET INCOME		6770382.			81568425			4853596			9482171			
NET EXPENDITURE		6414094			20438637			4711831			7719906			
NET YIELD/INCOME	6%	356268		6%	1129787		3%	141766		23%	1763365			

PHASING DEVELOPMENT APPRAISAL MODEL

WNSHIP DEVELOPMENT

	res 2 RESIDENT CLUSTERS				res 2 RESIDENT CLUSTERS				res 2 RESIDENT CLUSTERS				res 2 RESIDENT CLUSTERS			
ITE AREA	6000	ERR			6000	ERR			6000	ERR			6000	ERR		
ONSOLIDATIO																
UBDIVISION	0				0				0				0			
ENSITY	60 p/hectarunits				60 p/hectarunits				60 p/hectarunits				60 p/hectare units			
OVERAGE	60%	840		actual	60%	840		actual	60%	840		actual	60%	840		actual
.A.R.	1	750		0	1	750		0	1	750		0	1	750		0
BAYS REQUI																
O OF BAYS	no of units				no of units				no of units				no of units			
O OF ERVEN	12	3			12	3			12	3			12	3		
RF SIZE	400				400				400				400			
ERF OF LAN	80%	4800			80%	4800			80%	4800			80%	4800		
OADS	15%	900			15%	900			15%	900			15%	900		
ANDSCAPING	5%	300			5%	300			5%	300			5%	300		
NFRASTRUE																
AND COSTS	rands	metre		r/sq.m	rands	metre		r/sq.m	rands	metre		r/sq.m	rands	metre		r/sq.m
ite clearan	36000			6	0			0	0			0	0			0
ite terraci	36000			6	0			0	0			0	0			0
etain walls	0	0		225	0	0		225	0	0		225	0	0		225
total	72000				0				0				0			
ITE SERVICE																
ard landsc	67500			75	0			0	0			0	0			0
oft landsc	0				0			0	0			0	7500			25
ewer reticu	33000	220		150	0	0		150	0	0		150	0	0		150
ater retati	33000	220		150	0	0		150	0	0		150	0	0		150
ire mains	0	0		140	0	0		140	0	0		140	0	0		140
torm water	21000	150		140	0	0		140	0	0		140	0	0		140
lectr retic	50000			4000	0			0	0			4000	0			4000
alling	2 72000	250		120	2 0	0		120	2 0	0		120	2 0	0		120
ecurity	30000				10000				10000				10000			
total	306500				10000				10000				17500			
o/f.a.r/siz	cov	f.a.r	height	size	cov	f.a.r	height	size	cov	f.a.r	height	size	cov	f.a.r	height	size
ROTOTYPE 1	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250
ROTOTYPE 2	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250
ROTOTYPE 3	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250
ROTOTYPE 4	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250	0.63	0.63	1	250
o s t/type				r/sq.m				r/sq.m				r/sq.m				r/sq.m
ROTOTYPE 1	250000	118267		1000	250000			1000	250000			1000	250000			1000
ROTOTYPE 2	250000			1000	265000	69724		1060	250000			1000	250000			1000
ROTOTYPE 3	250000			1000	250000			1000	281250	73702		1125	250000			1000
ROTOTYPE 4	250000			1000	250000			1000	250000			1000	300000	78904		1200
o s t	no				no				no				no			
ROTOTYPE 1	3 750000				0 0				0 0				0 0			
ROTOTYPE 2	0 0				3 795000				0 0				0 0			
ROTOTYPE 3	0 0				0 0				3 843750				0 0			
ROTOTYPE 4	0 0				0 0				0 0				3 900000			
UILDING COS	750000				795000				843750				900000			
AND COSTS	72000				0				0				0			
ITE SERVICE	306500				10000				10000				17500			

D IMPR CO		1128500				205000				853750				917500					
ALATION																			
-contract	4	67710				0	0			0	0			0	0				
t-contrac	4	33855				4	24150			4	25613			4	27525				
charges	16%	196310				16%	144773			16%	152807			16%	163313				
charges-	0%	0				0%	0			0%	0			0%	0				
S OF CAPI		0					0				0				0				
tingency	5.0%	56425				5.0%	40250			5.0%	[illegible]88			5.0%	45875				
keting	5%	71811				5%	82009			5%	86152			5%	90229				
FESS FEES	8%	119453		1483300		8%	75684		1014173	8%	75684		1074857	8%	75684		1154213		
AL COSTS		1674564		1493158			1171866		946048		36694		946048		1320126		946048		
LING PRIC																			
TOTYPE 1	50%	478740	597007			70%	0			70%	0			70%	0				
TOTYPE 2		0					546725	616449			0				0				
TOTYPE 3		0					0				574350	648052			0				
TOTYPE 4		0					0				0				601527	680432			
TALS																			
TOTYPE 1																			
TOTYPE 2																			
TOTYPE 3																			
TOTYPE 4																			
R/UNIT CO		31542					833				833				1458				
S/UNIT CO		9954					6307				6307				6307				
D COST+PR		0	91297				0	87710			0	87710			0	83013			
E CTR-PR/		0					0				0				0				
INCOME		1436220	1791021				1640174	1849347			1723049	1944156			1804582	2041895			
EXPENDIT		1674564	1674564				1171866	1171866			1236694	1236694			1320126	1320126			
YIELD/IN	-14%	-238344	116457	7%		40%	468308	677481	58%		39%	486355	707463	57%		37%	484456	721169	55%
D/UNIT CO		38519					3987					3987					4612		
FIT ON LA		54776					83723					83723					78401		
PROFIT(L		164335					251170					251170					235203		
SS CUMM P		116457					783938					1501401					1867769		
N.LAND PR		164335					415505					666675					901878		
T CUMM PR		-47878					378433					834726					968891		
T CUMM EX		1674564					3846430					4083124					5403250		
SS CUMM I		1791021					3640368					5363417					7404712		
T RETURN															17.9%				
LAND VAL																	901878	landtr/s	150
D PRICE																	0		0
RATE															19.4%				

OFFICE PARK				INDUSRIAL PARK				
30000				30000				SITE AREA
								CONSOLIDATION
								SUBDIVISION
								DENSITY
60%	2419		actual	60%	2419		actual	COVERAGE
1.2	28800		0.96	1.2	19200		0.64	F.A.R.
	576							P BAYS REQUIRED
28				28				NO OF BAYS
6	6			6	6			NO OF ERVEN
4032				4032				ERF SIZE
81%	24192			81%	24192			% ERF OF LAND
9%	2808			9%	2808			ROADS
10%	3000			10%	3000			LANDSCAPING
								INFRASTRUC
rands	metre		r/sq.m	rands	metre		r/sq.m	LAND COSTS
210000			7	210000			7	site clearance
0			0	0			0	site terracing
0	0		225	0	0		225	retain walls
210000				210000				total
								SITE SERVICES
210600			75	210600			75	hard landsc
200000		item		200000		item		soft landsc
60000	400		150	60000	400		150	sewer reticulation
60000	400		150	60000	400		150	water reta
60000	400		150	60000	400		150	fire mains
56000	400		140	56000	400		140	storm water
300000		item		300000		item		electr retic
946600				946600				total
coverag	f.a.r.	height	size	coverag	f.a.r	height	size	no/f.a.r/size/r/sq
60%	1.2	2	4800	40%	0.8	2	3200	PROTOTYPE 1
60%	1.2	2	4800	40%	0.8	2	3200	PROTOTYPE 2
60%	1.2	2	4800	40%	0.8	2	3200	PROTOTYPE 3
60%	1.2	2	4800	40%	0.8	2	3200	PROTOTYPE 4
			r/sq.m				r/sq.m	c o s t/type
7132800			1486	3520000			1100	PROTOTYPE 1
7132800			1486	3520000			1100	PROTOTYPE 2
7132800			1486	3520000			1100	PROTOTYPE 3
7132800			1486	3520000			1100	PROTOTYPE 4
no				no				c o s t
2	14265600			2	7040000			PROTOTYPE 1
1	7132800			1	3520000			PROTOTYPE 2
2	14265600			2	7040000			PROTOTYPE 3
1	7132800			1	3520000			PROTOTYPE 4
42796800				21120000				BUILDING COST
210000				210000				LAND COSTS
946600				946600				SITE SERVICES
43953400				22276600				LAND IMPR COST
								ESCALATION
4	2637204			4	1336596			pre-contract

	12	3955806				10	1670745			post-contract
	0%	0				0%	0			fin charges-con
	0%	0				0%	0			fin charges-land
		48000					48000			LOSS OF CAPITAL
	10%	4395340				10%	2227650			PROCESS FEES
		48348740					24504260			TOTAL COSTS
		806127		24.87			624550		20.98	FREE LAND VALUE
		600000		20.00			600000		20.00	LAND PRICE
										SELLING PRICE
PROTO 1		4032	1900	68	PROTO 1		896	1100	32	PROTOTYPE 1
PROTO 2		4032	1900	68	PROTO 2		896	1100	32	PROTOTYPE 2
PROTO 3		4032	1900	68	PROTO 3		896	1100	32	PROTOTYPE 3
PROTO 4		4032	1900	68	PROTO 4		896	1100	32	PROTOTYPE 4
require		office	cover	open	require		industr	cover	open	
bays			parki	parki	bays		let space	parki	parki	
	3	85	155	85		1	18.6	155	85	RENTALS
	76	1440000	141626	77666		0	714240	0	32640	PROTOTYPE 1
	76	1440000	141626	69214		0	714240	0	32640	PROTOTYPE 2
	76	1440000	141626	69214		0	714240	0	32640	PROTOTYPE 3
	76	1440000	141626	69214		0	714240	0	32640	PROTOTYPE 4
		192767					192767			INFR/UNIT COST
		782557					371277			FEES/UNIT COST
		100000					3			LAND/UNIT COST
11.85%		55795877			10.60%		28184151			NET INCOME
		54989750					27559601			NET EXPENDITURE
1.25%					1.12%					NET YIELD/INCOME

FACADE WITH URBAN INTERFACE MODEL

FACADE WITH URBAN INTERFACE

ORIENTATION
NORTH
SOUTH
WEST
EAST

AIR CONDITIONING

MATERIALS	R/SQ.M	AREA PER FLOOR (sq.m)	NO OF FLOORS	TOTAL AREA (sq.m)	FL TO CEILING	PERIMR PARAM(L)	PERIMR PARAM(B)	PERIMETER AREA (sq.m)	SOLID 88.00%	VOID 12.00%	OTHER 0.90%	COST SOLID	COST VOID	PERIMETER COST	PLDG COST	% COST FACADE
FACE BRICK																
	77	900	3	3600	3.5	45	20	3150	2772	378		213444	245700	459144	5349600	8.58%
		450	2	900												
	88	900	3	3600	3.5	45	20	3150	2772	378		243936	245700	489636	5349600	9.15%
		450	2	900												
	99	900	3	3600	3.5	45	20	3150	2772	378		274428	245700	520128	5349600	9.72%
PLASTERED		450	2	900												
	100	900	3	3600	3.5	45	20	3150	2772	378		277200	245700	522900	5349600	9.77%
		450	2	900												
	125	900	3	3600	3.5	45	20	3150	2772	378		346500	245700	592200	5349600	11.07%
GLASS		450	2	900												
CURTAIN	500	900	3	3600	3.5	15	60	3150	2772	378		1386000	189000	1575000	5760000	27.34%
		450	2	900												
	600	900	3	3600	3.5	45	20	3150		378		1663200	226800	1890000	5349600	35.33%
		450	2	900												
	700	900	3	3600	3.5	45	20	3150	2772	378		1940400	264600	2205000	5349600	41.22%
MASONARY		450	2	900												
	1100	900	3	3600	3.5	45	20	3150	2772	378		3049200	245700	3294900	5349600	61.59%
		450	2	900												
	1250	900	3	3600	3.5	45	20	3150	2772	378		3465000	245700	3710700	5349600	69.36%
CONCRETE		450	2	900												
	250	900	3	3600	3.5	45	20	3150	2772	378		693000	245700	938700	5349600	17.55%
		450	2	900												
	350	900	3	3600	3.5	15	60	3150	2772	378		970200	189000	1159200	5760000	20.13%
		450	2	900												
	450	900	3	3600	3.5	45	20	3150	2772	378		1247400	245700	1493100	5349600	27.91%
ALUMINIUM		450	2	900												
	450	900	3	3600	3.5	45	20	3150	2772	378		1247400	245700	1493100	5349600	27.91%
		450	2	900												
	550	900	3	3600	3.5	45	20	3150	2772	378		1524600	245700	1770300	5349600	33.09%
		450	2	900												
	650	900	3	3600	3.5	45	20	3150	2772	378		1801800	245700	2047500	5349600	38.27%
MIXED		450	2	900												
	500	900	3	3600	3.5	45	20	3150	2772	378		1386000	245700	1631700	5349600	30.50%
		450	2	900												
	600	900	3	3600	3.5	15	60	3150	2772	378		1663200	189000	1852200	5760000	32.16%
		450	2	900												
	700	900	3	3600	3.5	45	20	3150	2772	378		1940400	245700	2186100	5349600	40.86%
OTHER		450	2	900												
	900	900	3	3600	3.5	45	20	3150	2772	378		2494800	245700	2740500	5349600	51.23%
		450	2	900												
	1200	900	3	3600	3.5	45	20	3150	2772	378		3326400	245700	3572100	6480000	55.13%

CASHFLOW MODEL

CASHFLOW MODEL

FINANCIAL CASHFLOW

	LOAN VALUE	NET INCOME	INTEREST	GROSS PROF	TAX	NET PROFIT	ANNUAL PRO	CUM PROFIT	PRESENT V	
year1	2702700	26520	0.80%	4898.4	1224.6	3673.8				
MONTH 1	2699026.20	26520.00	21592.21	4927.79	1231.95	3695.84		3695.84	3666.51	
MONTH 2	2695330.36	26520.00	21562.64	4957.36	1239.34	3718.02		7413.86	7347.75	
MONTH 3	2691612.34	26520.00	21532.90	4987.10	1246.78	3740.33		11154.19	11048.81	
MONTH 4	2687872.01	26520.00	21502.98	5017.02	1254.26	3762.77		14916.95	14754.80	
MONTH 5	2684109.25	26520.00	21472.87	5047.13	126..78	3785.34		18702.30	18480.83	
MONTH 6	2680323.90	26520.00	21442.59	5077.41	1269.35	3808.06		22510.36	22221.99	
MONTH 7	267..515.84	26520.00	21412.13	5107.87	1276.97	3830.90		26341.26	25978.40	
MONTH 8	2672684.94	26520.00	21381.48	5138.52	1284.63	3853.89		30195.15	29750.16	
MONTH 9	2668831.05	26520.00	21350.65	5169.35	1292.34	3877.01		34072.16	33537.38	
MONTH 10	2664954.04	26520.00	21319.63	5200.37	1300.09	3900.28		37972.44	37340.16	
MONTH 11	2661053.76	26520.00	21288.43	5231.57	1307.89	3923.68		41896.12	41158.81	3820.28
MONTH 12	2657130.08	26520.00	21257.04	5262.96	1315.74	3947.22	45843.34	45843.34	44992.83	45694.69
year 2										
MONTH 1	2653182.86	28376.40	21225.46	7150.94	1787.73	5363.20		51206.54	5320.64	
MONTH 2	2647819.66	28376.40	21182.56	7193.84	1798.46	5395.38		56601.92	10662.64	
MONTH 3	2642424.28	28376.40	21139.39	7237.01	1809.25	5427.75		62029.68	16026.16	
MONTH 4	2636996.52	28376.40	21095.97	7280.43	1820.11	5460.32		67490.00	21411.35	
MONTH 5	2631536.20	28376.40	21052.29	7324.11	1831.03	5493.08		72983.08	26818.35	
MONTH 6	2626043.12	28376.40	21008.34	7368.06	1842.01	5526.04		78509.12	32247.33	
MONTH 7	2620517.08	28376.40	20964.14	7412.26	1853.07	5559.20		84068.32	37698.42	
MONTH 8	2614957.63	28376.40	20919.66	7456.74	1864.18	5592.55		89660.87	43171.79	
MONTH 9	2609365.33	28376.40	20874.92	7501.48	1875.37	5626.11		95286.98	48667.59	
MONTH 10	2603739.22	28376.40	20829.91	7546.49	1886.62	5659.86		100946.84	54185.97	
MONTH 11	2598079.36	28376.40	20784.63	7591.77	1897.94	5693.82		106640.67	59727.09	5543.78
MONTH 12	2592385.53	28376.40	20739.08	7637.32	1909.33	5727.99	66525.32	112368.66	65291.11	66309.61
year 3										
MONTH 1	2586657.54	30362.75	20693.26	9669.49	2417.37	7252.12		119620.77	7194.56	
MONTH 2	2579405.41	30362.75	20635.24	9727.50	2431.88	7295.63		126916.40	14418.01	
MONTH 3	25..2109.80	30362.75	20576.88	9785.87	2446.47	7339.40		134255.80	21670.56	
MONTH 4	2564770.40	30362.75	20518.16	9844.58	2461.15	7383.44		141639.24	28953.40	
MONTH 5	2557386.96	30362.75	20459.10	9903.65	2475.91	7427.74		149066.98	36263.74	
MONTH 6	2549959.82	30362.75	20399.67	9963.07	2490.77	7472.31		156539.29	43604.79	
MONTH 7	2542486.91	30362.75	20339.90	10022.85	2505.71	7517.14		164056.42	50975.76	
MONTH 8	2534969.78	30362.75	20279.76	10082.99	2520.75	7562.24		171618.67	58376.84	
MONTH 9	2527407.53	30362.75	20219.26	10143.49	2535.87	7607.62		179226.28	65808.25	
MONTH 10	2519799.92	30362.75	20158.40	10204.35	2551.09	7653.26		186879.54	73270.20	
MONTH 11	2512146.66	30362.75	20097.17	10265.57	2566.39	7699.18		194578.73	80762.90	
MONTH 12	2504447.47	30362.75	20035.58	10327.17	2581.79	7745.38	89955.45	202324.10	88441.55	
year 4										
MONTH 1	2496702.10	32488.14	19973.62	12514.52	3128.63	9385.89		211709.99		
MONTH 2	2487316.21	32488.14	19898.53	12589.61	3147.40	9442.21		221152.20		
MONTH 3	2477874.00	32488.14	19822.99	12665.15	3166.29	9498.86		230651.06		
MONTH 4	2468375.14	32488.14	19747.00	12741.14	3185.28	9555.85		240206.91		
MONTH 5	2458819.28	32488.14	19670.55	12817.59	3204.40	9613.19		249820.11		
MONTH 6	2449206.09	32488.14	19593.65	12894.49	3223.62	9670.87		259490.98		
MONTH 7	2439535.22	32488.14	19516.28	12971.86	3242.96	9728.89		269219.87		
MONTH 8	2429806.33	32488.14	19438.45	13049.69	3262.42	9787.27		279007.14		
MONTH 9	2420019.06	32488.14	19360.15	13127.99	3282.00	9845.99		288853.13		
MONTH 10	2410173.07	32488.14	19281.38	13206.76	3301.69	9905.07		298758.20		
MONTH 11	2400268.00	32488.14	19202.14	13286.00	3321.50	9964.50		308722.69		
MONTH 12	2390303.51	32488.14	19122.43	13365.71	3341.43	10024.28	116482.68	318746.98		
year 5										
MONTH 1	2380279.22	34762.31	19042.23	15720.08	3930.02	11790.06		330537.03		
MONTH 2	2368489.17	34762.31	18947.91	15814.40	3953.60	11860.80		342397.83		
MONTH 3	2356628.37	34762.31	18853.03	15909.28	3977.32	11931.96		354329.79		

MONTH 4		2344896.41	34762.31	18737.37	16004.74	4001.18	12003.55		864323.85
MONTH 5		2330492.85	34762.31	18661.34	16100.77	4025.19	12075.58		876408.02
MONTH 6		2320617.28	34762.31	18564.94	15197.37	4049.34	12148.03		890536.05
MONTH 7		2308849.85	34762.31	18467.75	16294.56	4073.64	12220.92		908777.87
MONTH 8		2298248.33	34762.31	18369.99	16392.32	4098.08	12294.24		415972.11
MONTH 9		2283954.89	34762.31	18271.63	16490.68	4122.67	12368.01		427946.12
MONTH 10		2271586.08	34762.31	18172.69	16589.62	4147.41	12442.22		439892.34
MONTH 11		2259143.86	34762.31	18073.15	16689.16	4172.29	12516.87		452399.21
MONTH 12		2246626.99	34762.31	17973.02	16789.29	4197.32	12591.97	146844.20	464991.18
	year 6								
MONTH 1		2234035.02	37195.67	17872.28	19323.39	4830.85	14492.54		479483.72
MONTH 2		2219542.48	37195.67	17756.34	19439.33	4859.83	14579.50		494063.22
MONTH 3		2204962.98	37195.67	17639.70	19555.97	4888.99	14666.98		508730.20
MONTH 4		2190294.00	37195.67	17522.37	19673.30	4918.33	14754.98		523485.17
MONTH 5		2175541.03	37195.67	17404.33	19791.34	4947.84	14843.51		538328.68
MONTH 6		2160697.52	37195.67	17285.58	19910.09	4977.52	14932.57		553261.25
MONTH 7		2145764.95	37195.67	17166.12	20029.55	5007.39	15022.16		568283.41
MONTH 8		2130742.79	37195.67	17045.94	20149.73	5037.43	15112.30		583395.71
MONTH 9		2115630.49	37195.67	16925.04	20270.63	5067.66	15202.97		598598.68
MONTH 10		2100427.52	37195.67	16803.42	20392.25	5098.06	15294.19		613892.87
MONTH 11		2085133.33	37195.67	16681.07	20514.61	5128.65	15385.95		629278.83
MONTH 12		2069747.37	37195.67	16557.98	20637.69	5159.42	15478.27	179765.92	644957.10
	year 7								
MONTH 1		2054269.10	39799.37	16434.15	23365.22	5841.30	17523.91		662281.01
MONTH 2		2036745.19	39799.37	16293.96	23505.41	5876.35	17629.06		679910.06
MONTH 3		2019116.14	39799.37	16152.93	23646.44	5911.61	17734.83		697644.89
MONTH 4		2001381.31	39799.37	16011.05	23788.32	5947.08	17841.24		715486.13
MONTH 5		1983540.07	39799.37	15868.32	23931.05	5982.76	17948.29		733434.42
MONTH 6		1965591.78	39799.37	15724.73	24074.63	6018.66	18055.98		751490.39
MONTH 7		1947535.81	39799.37	15580.29	24219.08	6054.77	18164.31		769654.71
MONTH 8		1929371.49	39799.37	15434.97	24364.40	6091.10	18273.30		787928.00
MONTH 9		1911048.20	39799.37	15288.79	24510.59	6127.65	18382.94		806310.94
MONTH 10		1892715.26	39799.37	15141.72	24657.65	6164.41	18493.24		824804.18
MONTH 11		1874222.02	39799.37	14993.78	24805.59	6201.40	18604.19		843408.37
MONTH 12		1855617.83	39799.37	14844.94	24956.43	6238.61	18715.82	217367.10	862124.19
	year 8								
MONTH 1		1836902.01	42585.32	14695.22	27890.11	6972.53	20917.58		883041.77
MONTH 2		1815984.43	42585.32	14527.88	28057.45	7014.36	21043.09		904084.86
MONTH 3		1794941.34	42585.32	14359.53	28225.79	7056.45	21169.35		925254.20
MONTH 4		1773772.00	42585.32	14190.18	28395.15	7098.79	21296.36		946550.57
MONTH 5		1752475.63	42585.32	14019.81	28565.52	7141.38	21424.14		967974.71
MONTH 6		1731051.49	42585.32	13848.41	28736.91	7184.23	21552.68		989527.39
MONTH 7		1709498.81	42585.32	13675.99	28909.33	7227.33	21682.00		1011209.39
MONTH 8		1687816.81	42585.32	13502.53	29082.79	7270.70	21812.09		1033021.48
MONTH 9		1666004.72	42585.32	13328.04	29257.29	7314.32	21942.97		1054964.45
MONTH 10		1644061.75	42585.32	13152.49	29432.83	7358.21	22074.62		1077039.07
MONTH 11		1621987.13	42585.32	12975.90	29609.43	7402.36	22207.07		1099246.14
MONTH 12		1599780.06	42585.32	12798.24	29787.08	7446.77	22340.31	259462.27	1121586.46

DEVELOPMENT SUMMATION MODEL

DEVELOPMENT SUMMATION

	RESIDENTIAL			RETAIL		
	CLUSTER	TOWNHOUSE	TOWNSHIP	SHOPPING COMPLEX	OTHER	
PLANNING						
zoning						
f.a.r.						
density						
coverage						
parking						
erf si						
height						
policy						
subdivi						
consolida						
ARCHITECTURE						
typology						
size						
residential						
one bedra						
two bedra						
three bed						
low						
middle						
high						
retail						
neighbour						
local						
district						
street						
precinct						
commercial						
city						
local						
district						
highrise						
lowrise						
lowkey						
mixeduse						
resretail						
X 25						
50						
75						
comretail						
25						
50						
industrial						
warehouse						
light ind						
heavy ind						
URBAN DESIGN						

	landuse																	
	phasing																	
X	landscapi																	
traffic																		
	cars/hous																	
	public tr																	
	taxis																	
	infrastru																	
	secondary																	
	main																	
	arterial																	
	motorway																	
	public sp																	
	private s																	
	junior sc																	
	senior sc																	
	clinic																	
	hospital																	
	church																	
	open spce																	
ECONOMICS																		
	cost/sq.m																	
	bldg cost																	
	dev cost																	
	cash flow																	
	return																	
	land valu																	
	interest																	
	cap rate																	
X	public no																	
X	private n																	

DEVELOPMENT STRATEGY MODEL

DEVELOPMENT STRATEGY

LAND		PLANNING PARAMETERS						URBAN DESIGN INITIATIVES			
ERF No	EXIST ZONING	SIZE sq.m	PROPOSED ZONING	DENSITY per hect	F.A.R.	COVERAGE	HEIGHT stories	PARKING bays	DIRECTIVES	CONTROLS	INCENTIVES	PHASING
BLOCK A												
523	BUS 1	2046		50	1.4	0.6	2					
435	BUS 1	1213										
434	RES 1	991										
433	RES 1	991										
425	RES 1	991										
424	RES 1	991										
432	RES 1	991										
423	RES 1	991										
431	RES 1	991										
422	RES 1	991										
430	RES 1	991										
421	RES 1	991										
429	RES 1	991										
420	RES 1	991										
428	RES 1	991										
BLOCK AREA		16142										
TOTAL STANDS		15										
BLOCK B												
443	BUS 1	991										
431	BUS 1	991										
442	RES 1	991										
450	RES 1	991										
441	RES 1	991										
449	RES 1	991										
440	RES 1	991										
448	RES 1	991										
439	RES 1	991										
447	RES 1	991										
438	RES 1	991										
446	RES 1	991										
437	RES 1	991										
445	RES 1	991										
436	RES 1	991										
444	RES 1	991										
BLOCK AREA		15056										
TOTAL STANDS		16										
CONSOLIDATION												
variation 1		1	991									
variation 2		2	1982									
variation 3		3	2973									
variation 4		4	3964									
variation 5		5	4955									
variation 6		6	5946									
variation 7		7	6937									

Variation B		B	7928
BLOCK C			
	452	RES 1	991
	453	RES 1	991
	454	RES 1	991
	455	RES 1	991
	460	RES 1	991
	461	RES 1	991
	462	RES 1	991
BLOCK AREA			6937
TOTAL STANDS			7
BLOCK D			
	471.1	RES 1	991
	471.2	RES 1	991
	472	RES 1	1850
	479	RES 1	580
BLOCK AREA			4412
TOTAL STANDS			4
BLOCK A consolidation			3259
			2204
			1982
			1982
			1982
			1982
			1982

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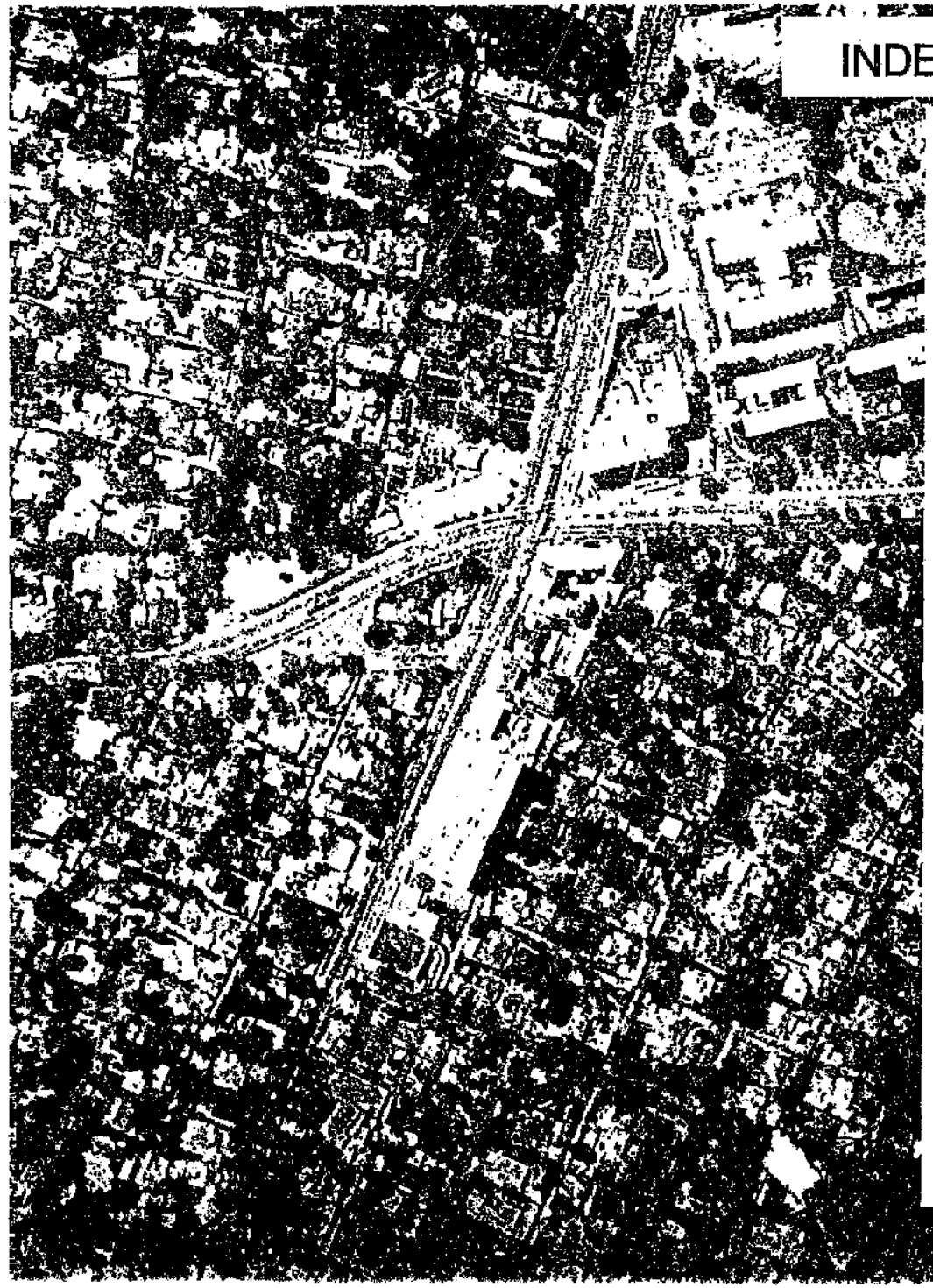
CASE STUDY 1

parkwood / rosebank

CHAPTER 6



INDEX

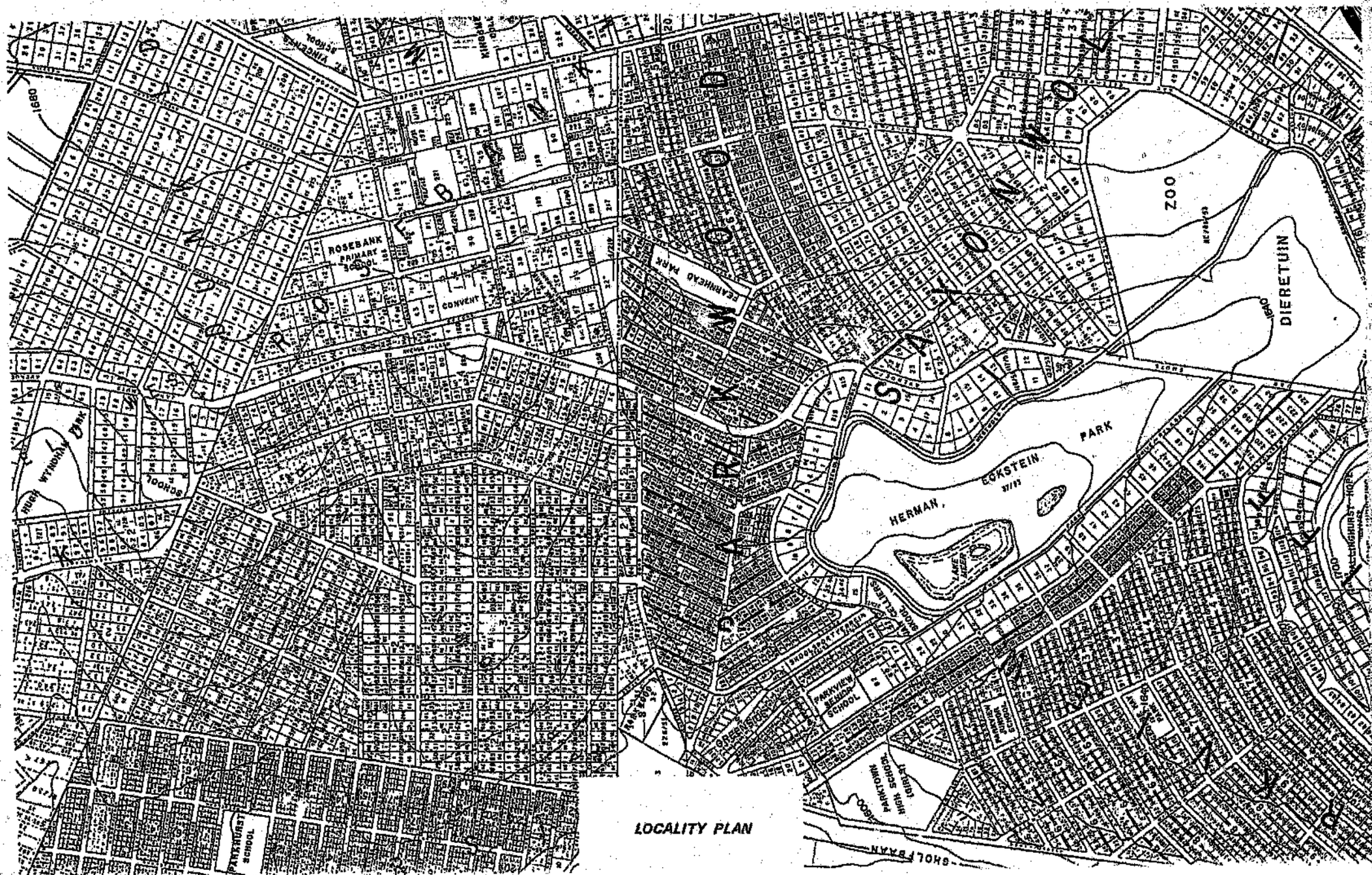
INTRODUCTION

This proposal and submission has provided the opportunity to examine the development within a process involving the synthesis of Planning Policy, Architecture, and Urban Design. This process seeks to establish an understanding of the existing pressures acting on the area, and to provide through a medium of analytical matrix's, a land use and development form which not only takes cognisance of the ambient environment, but also hopes to achieve a positive and practical solution within its context. The process is guided by providing criteria which are themselves examined with respect to various land uses that are applicable to the site and to the area. The appraisal establishes the basis for choice and provides direction in the development of a sensitive and integrated design approach. The criteria not only inform and provide question on a broad level, they also perform as design principles.

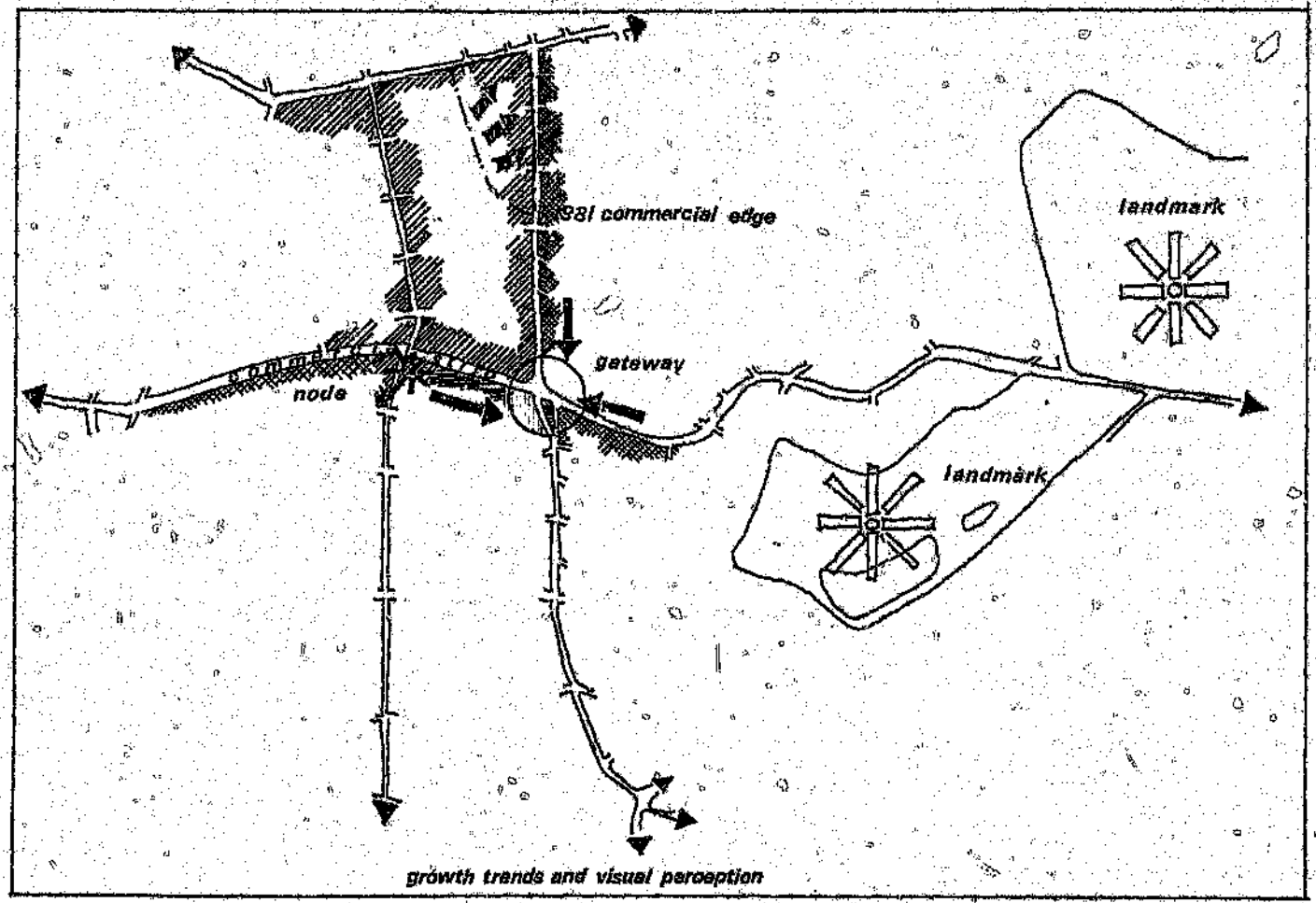
The architectural response is thus founded on a process which not only takes cognisance of its environment, but also to find a balance between existing planning policies for the area whilest seeks to find a workable solution to the contraints of the program.

The proposed commercial development, thus through this presentation, motivates for modifications of the present policy and zoning for the site.

The development manages to obtain a low F.A.R and COVERAGE of the site yet providing for maximum development potential within the bounds of sensitivity and intergration.



LOCALITY PLAN



The site forms part of the north-south seam, and acts as the gateway to the Rosebank area from the south and western approaches.The strip not only acts as an arterial to vehicular movement, but provides for access to and the establishment of commercial landuse in the form of home office type to the office block type. Important landmarks such as the Zoo and the Zoo Lake in the south and nodes such as prominent and established retail activities to the north of the development provide measure and familiarity. The proposed commercial landuse would form part of the western low key commercial development strip and will be in vogue with future developments in the area.

URBAN DESIGN ANALYSIS

Development scenarios are established as a basis for appraisal of the appropriate options available.

The various development options explored and examined are:

1. RETAIL DEVELOPMENT
   shopping precinct
2. RETAIL/COMMERCIAL DEVELOPMENT
   ground floor shopping with first floor office space
3. COMMERCIAL DEVELOPMENT
   two storey office building with parking
4. HOME OFFICE DEVELOPMENT
   adaption of existing houses for commertial use
5. PUBLIC GARAGE AND PARKING
   service and petrol station and parking
6. RETAIL/RESIDENTIAL DEVELOPMENT
   ground floor shopping with first floor residential flats

Various design criteria having a significant impact on any development have been established and tested against each scenario. Each criteria were evaluated through five inherent characteristics.

1. DEMAND
2. SUITABILITY
3. RELEVANCE
4. CONTRIBUTION
5. FEASIBILITY

Each evaluation criteria were measured and rendered with a point system and its performance was defined as follows:

- ○ POOR
- ◔ AVERAGE
- ◑ GOOD
- ◕ VERY GOOD
- ● EXCELLENT

A comparative evaluation of the various scenarios should provide an indication as to the optimum development proposal to be considered within the context of the site.

URBAN DESIGN

B. ANALYSIS MATRIX

	CRITERIA	1.	2.	3.	4.	5.	6.
1.	SCALE	◐	◐	◔	●	◐	◔
2.	SENSITIVITY	◑	◐	◐	●	◐	◐
3.	INTERGATION	●	◔	◔	●	○	●
4.	CONVEVIENCE	○	●	●	○	●	◔
5.	IDENTITY	●	◔	◐	○	◐	●
6.	CHARACTER	●	●	◐	●	○	●
7.	VIEWS FROM THE ROAD	●	●	●	●	○	◐
8.	VISUAL INTEREST	◐	◔	◐	●	○	●
9.	AMENITY/COMFORT	○	●	●	○	◐	◔
10.	ARCHITECTURAL RESPONSE	●	●	●	●	○	◐
11.	CONTROLS	◐	●	◐	●	◔	●
12.	ORIENTATION	◐	●	●	●	●	◐
13.	LANDSCAPE	◐	◐	◔	●	◐	◐
14.	ROBUST & FLEXIBILTY	●	○	◐	○	○	●
15.	DISTRICT CONTRIBUTION	◐	◐	◑	○	◔	◔
	IMPACT OF DEVELOPMENT	1018	1012	1014	1015	1000	1006

A. ANALYSIS MATRIX

LAND USE

CRITERIA	1.	2.	3.	4.	5.	6.
1. VIABILITY (demand, suitability)	○	◐	◐	◕	◕	○
2. FEASIBILITY (time, return)	◐	◐	◐	○	◐	○
3. LOCATION	◐	●	●	◐	●	○
4. LETABILITY	●	●	●	◕	●	◐
5. ACCESS AND CIRCULATION	◕	◕	●	◐	●	◕
6. FLEXIBILITY	◕	○	◐	◐	◕	◕
7. PARKING	◕	◕	◕	◐	●	◐
8. VISIBILTY	●	●	●	◐	●	◕
9. IMAGEABILITY	●	●	●	◐	●	◕
10. COMPATIBILITY	◐	◐	●	●	○	◐
11. PRESENT POLICY	○	○	○	●	●	○
IMPACT OF DEVELOPMENT	738	740	744	749	746	732

TRAFFIC & INFASTRUCTURE

C. ANALYSIS MATRIX

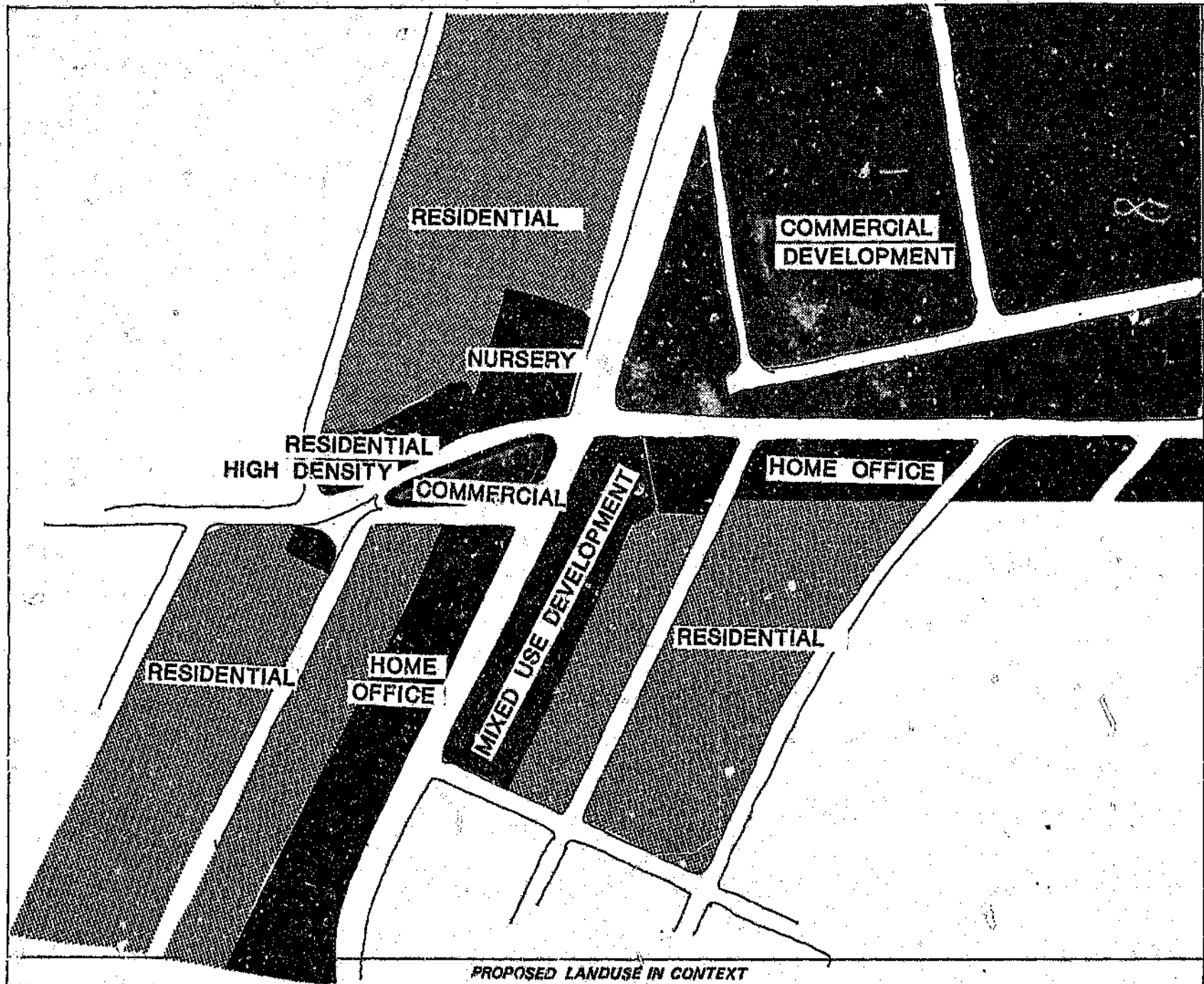
CRITERIA	1.	2.	3.	4.	5.	6.
1. PUBLIC PARKING	○	◐	◕	●	●	○
2. PRIVATE PARKING	◐	◐	◐	●	●	○
3. No of PARKING BAYS	○	○	◐	●	●	○
4. ACCESS/EGRESS - SITE	◔	◔	●	◑	◑	◐
5. PEDESTRIAN ACTIVITY	◔	◔	◑	◑	◑	◔
6. TRAFFIC CIRCULATION	○	◐	◑	◑	◑	◐
7. FUTURE DEMAND	◔	◔	◑	●	●	◐
8. DEVELOPMENT POPULATION	◔	○	○	◑	●	◐
9. VISITORS TO DEVELOPMENT	○	◐	◑	◑	◐	◐
10. SERVICE VEHICLES	○	◐	◔	◑	◐	◐
11. SERVICES	●	◑	◑	●	●	●
12. EXISTING INFASTRUCTURE	◐	◐	◑	●	●	◐
IMPACT OF DEVELOPMENT	792	793	804	819	812	797

SCENARIOS

D. SUMMATION

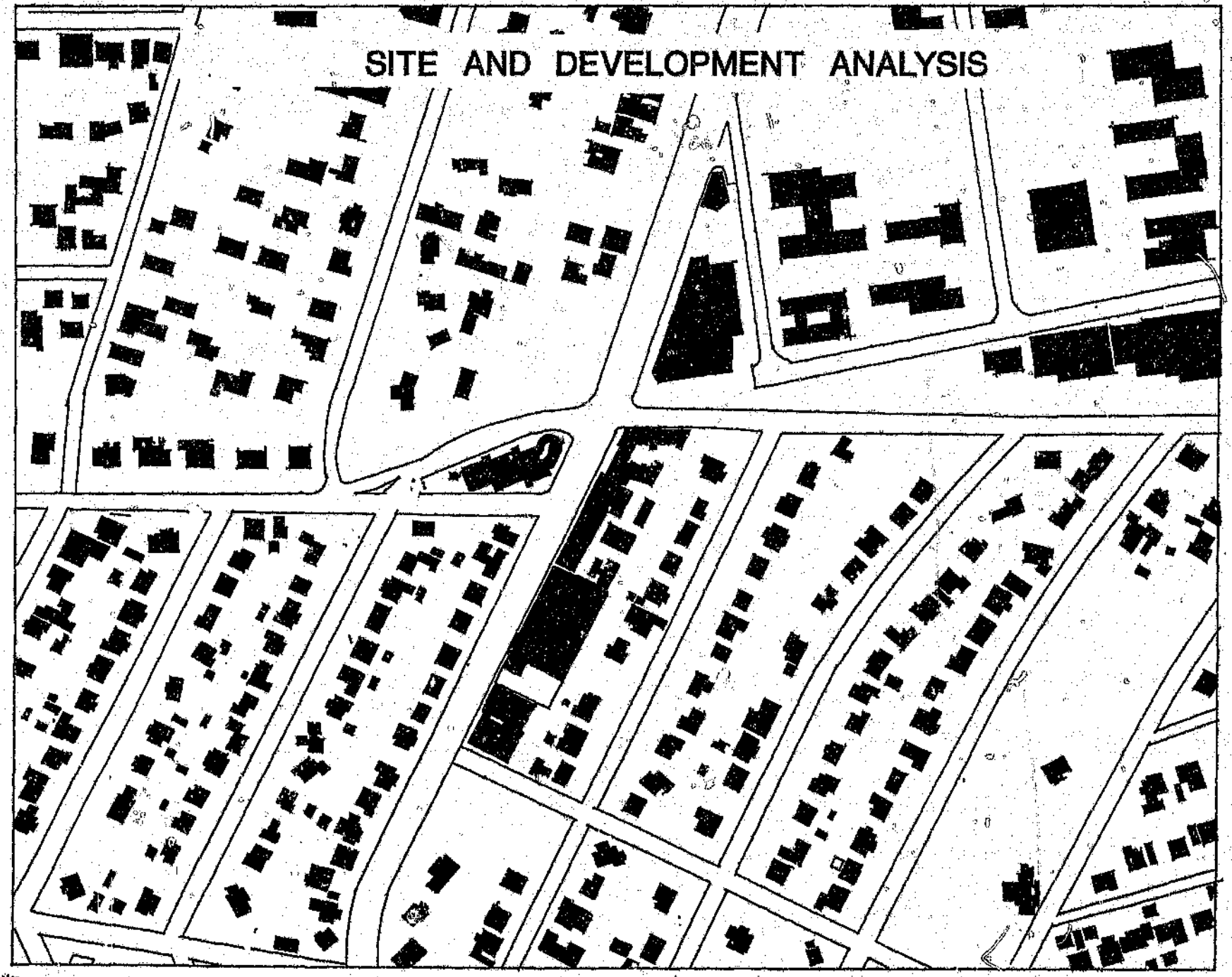
	CRITERIA	1.	2.	3.	4.	5.	6.
1.	LAND USE	738	740	744	749	746	732
2.	URBAN DESIGN	1018	1012	1014	1015	1000	1006
3.	TRAFFIC/INFRASTRUCTURE	792	793	804	819	812	797
	IMPACT OF DEVELOPMENT	2548	2545	2562	2583	2558	2535

Scenario 4 (*HOME OFFICE* DEVELOPMENT) of all the options studied, is seen through this analysis, to measure most favourably to development on this site.

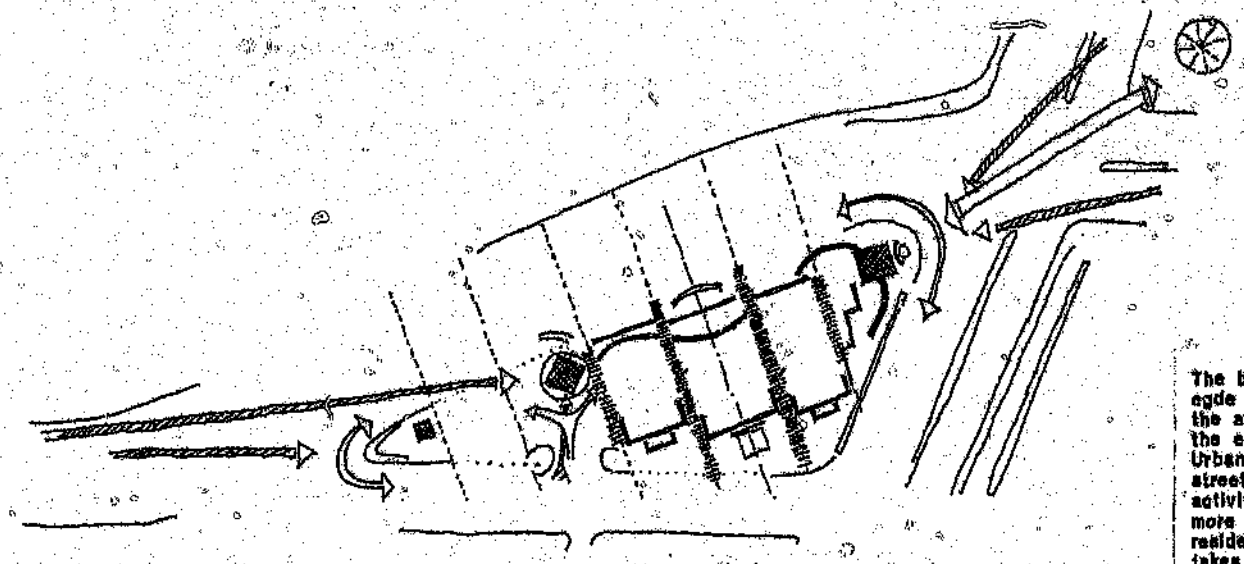


PROPOSED LANDUSE IN CONTEXT

SITE AND DEVELOPMENT ANALYSIS

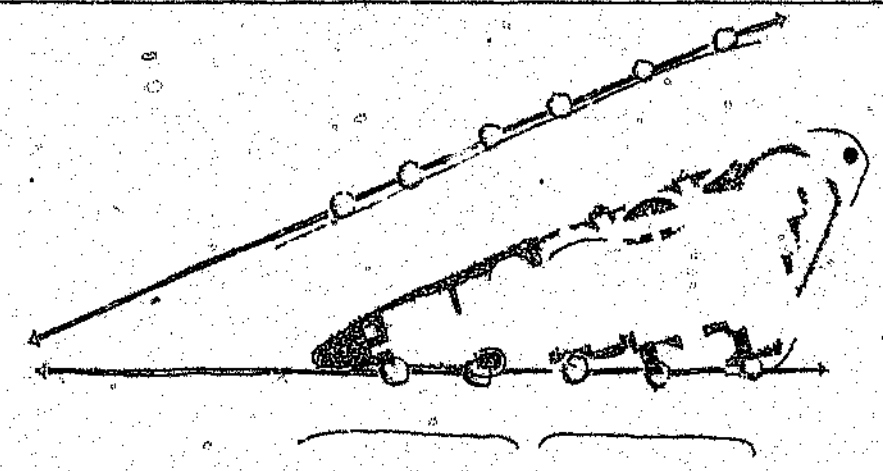


footprint study



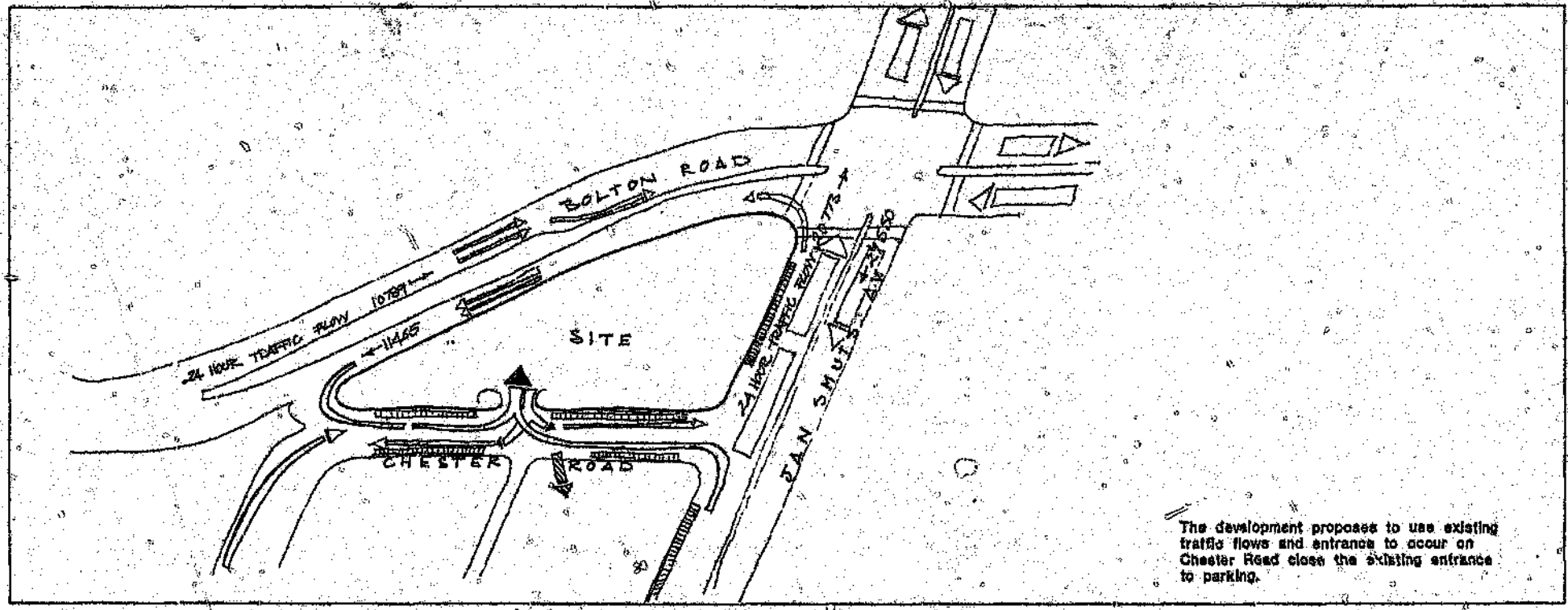
site ergonomics

The building provides for an organic edge on Bolton Road in response to the adjacent land use and to break the existing hard edge of the site. Urban elements are also used on this street frontage in response to the street activity. The frontage onto Chester Road is more rhythmically composed to express a residential typology .The building also takes cognisance of the two very important corner conditions with respect to visual, axial, and focal points on the site.



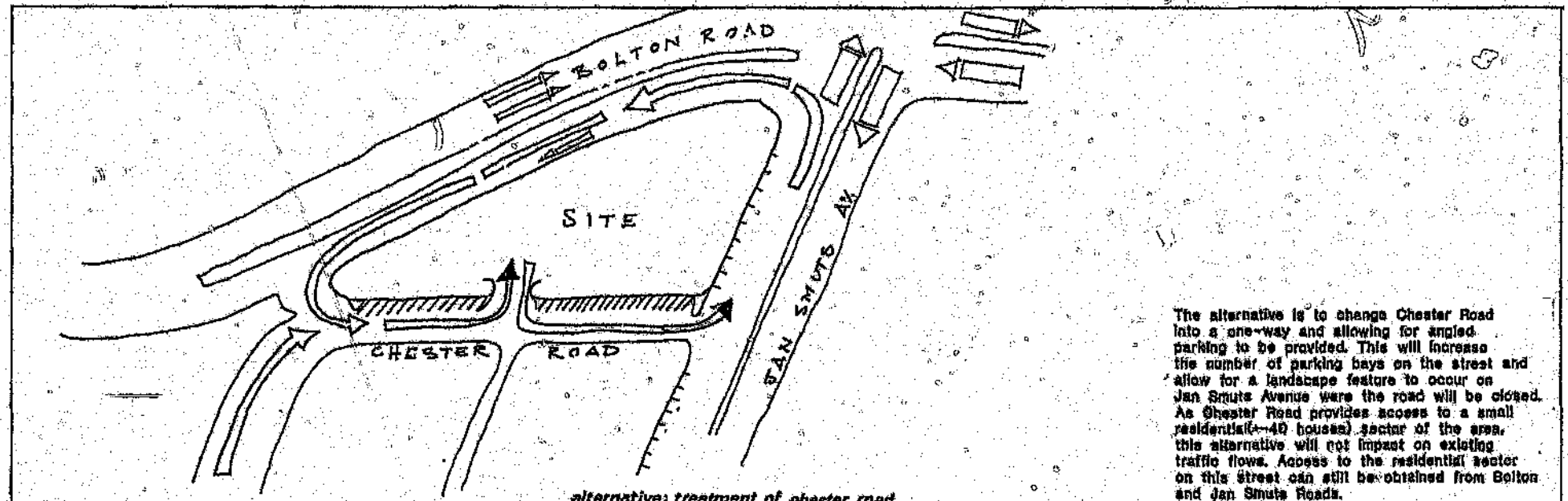
landscaping component

Landscaping is provided for on the Bolton Road street edge as an expression of the organic nature of the building on that edge, and also responds to the adjacent landuse(NURSERY).The western corner of the site is seen as an opportunity to express softness and curvature. Trees line the street on Bolton and Chester Roads to express rhythm and scale, and to create a more formal expression of gateway into ROSEBANK from the western approach.



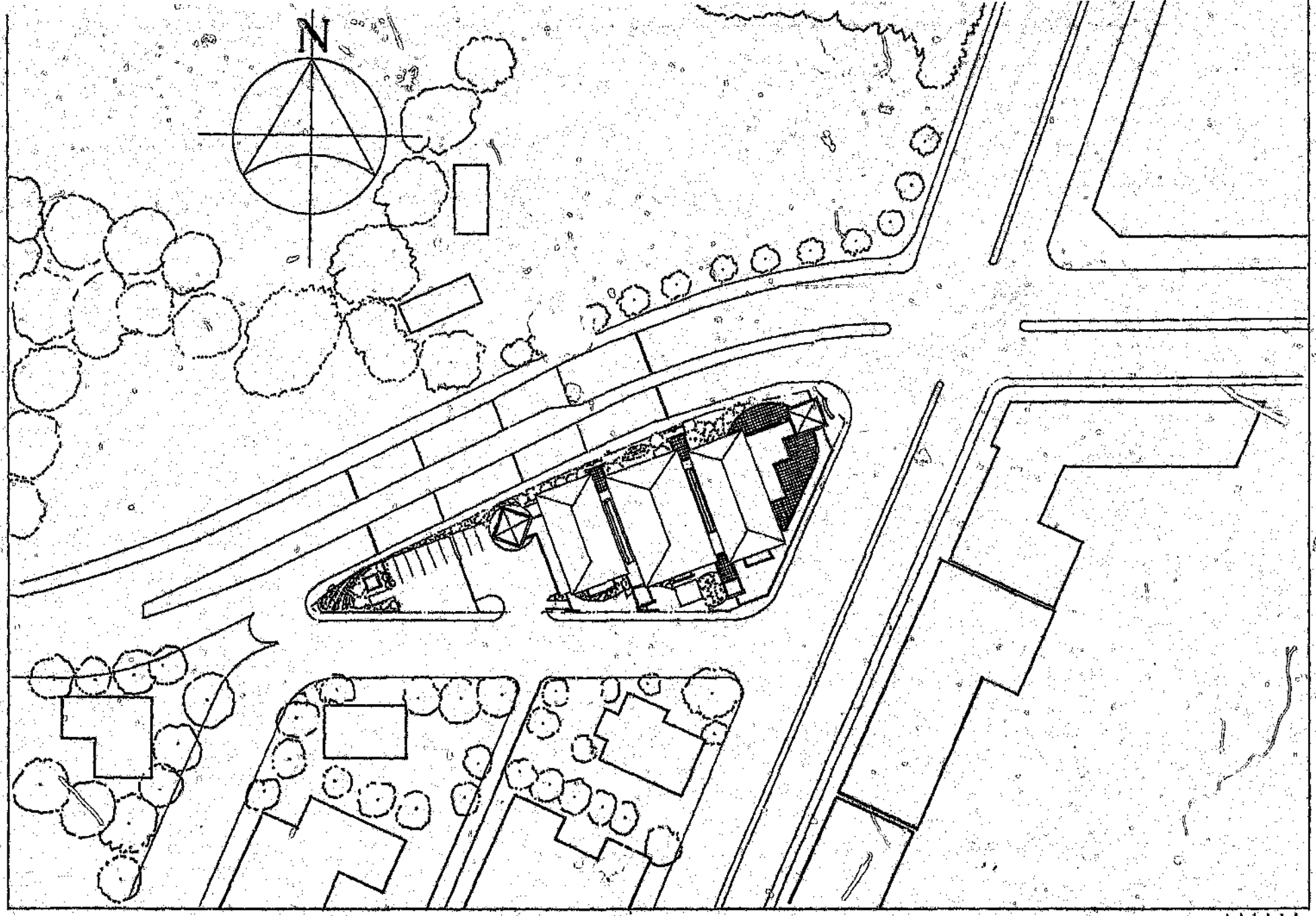
The development proposes to use existing traffic flows and entrance to occur on Chester Road close the existing entrance to parking.

development proposal including traffic flows and parking

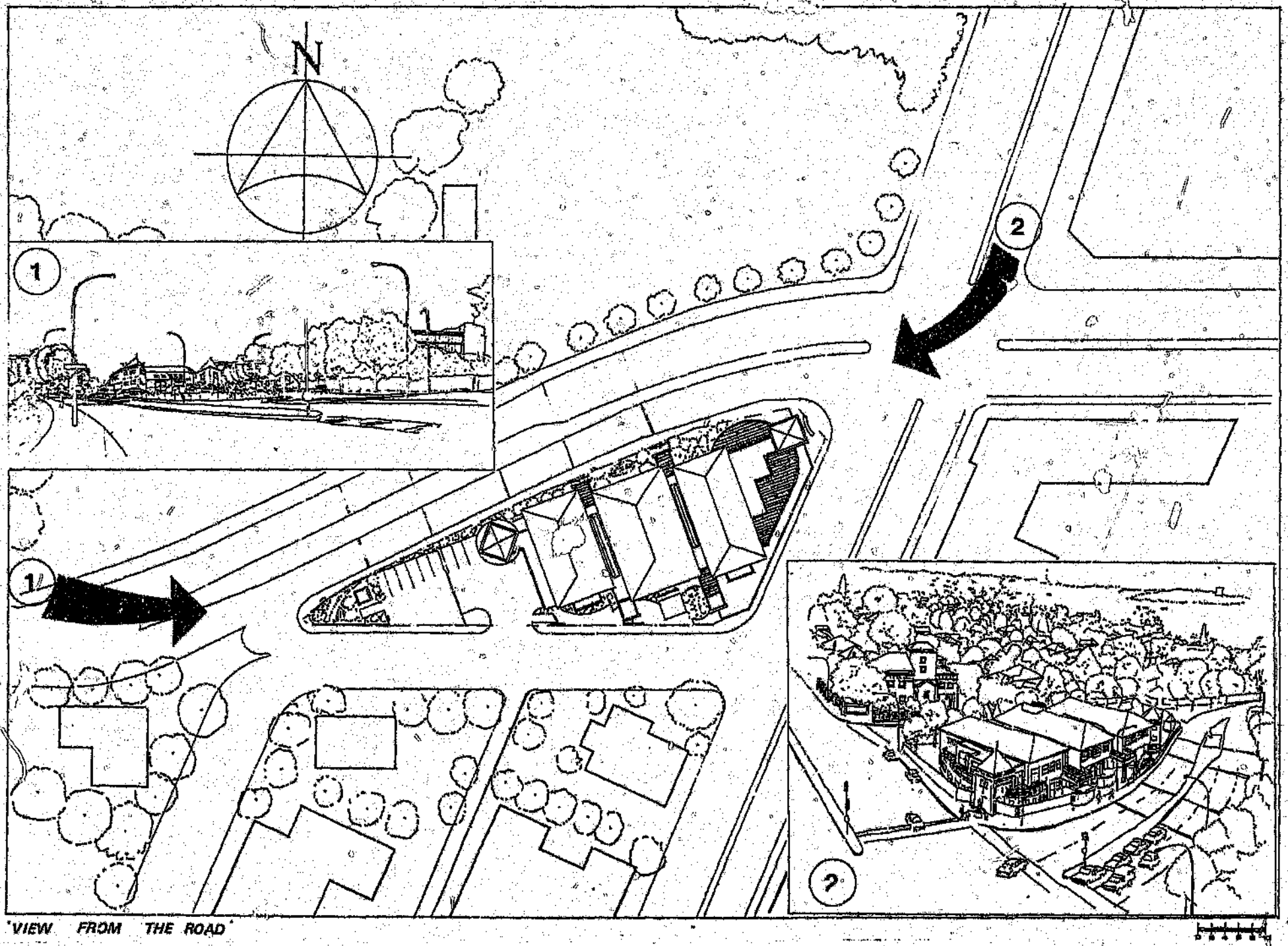


The alternative is to change Chester Road into a one-way and allowing for angled parking to be provided. This will increase the number of parking bays on the street and allow for a landscape feature to occur on Jan Smuts Avenue were the road will be closed. As Chester Road provides access to a small residential(+-40 houses) sector of the area, this alternative will not impact on existing traffic flows. Access to the residential sector on this street can still be obtained from Bolton and Jan Smuts Roads.

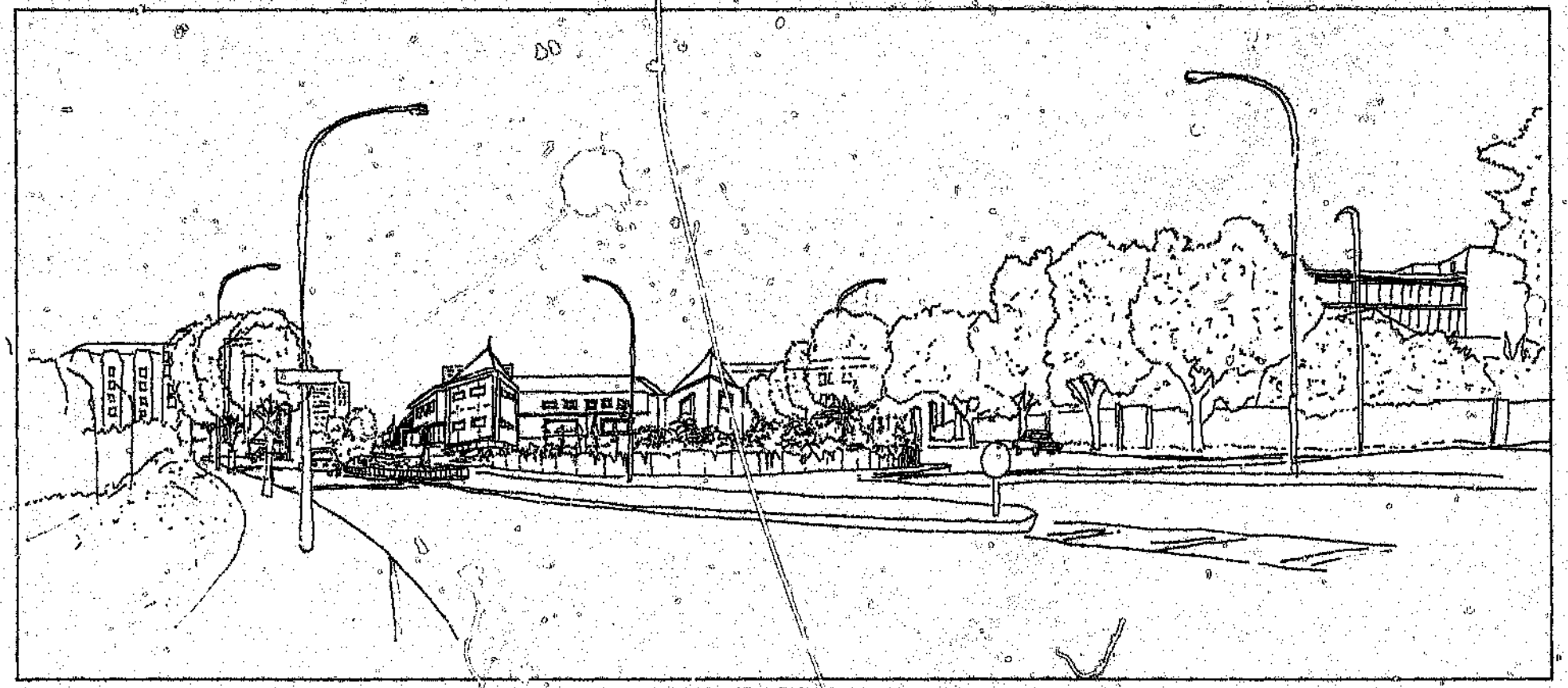
alternative: treatment of chester road



SITE LAYOUT

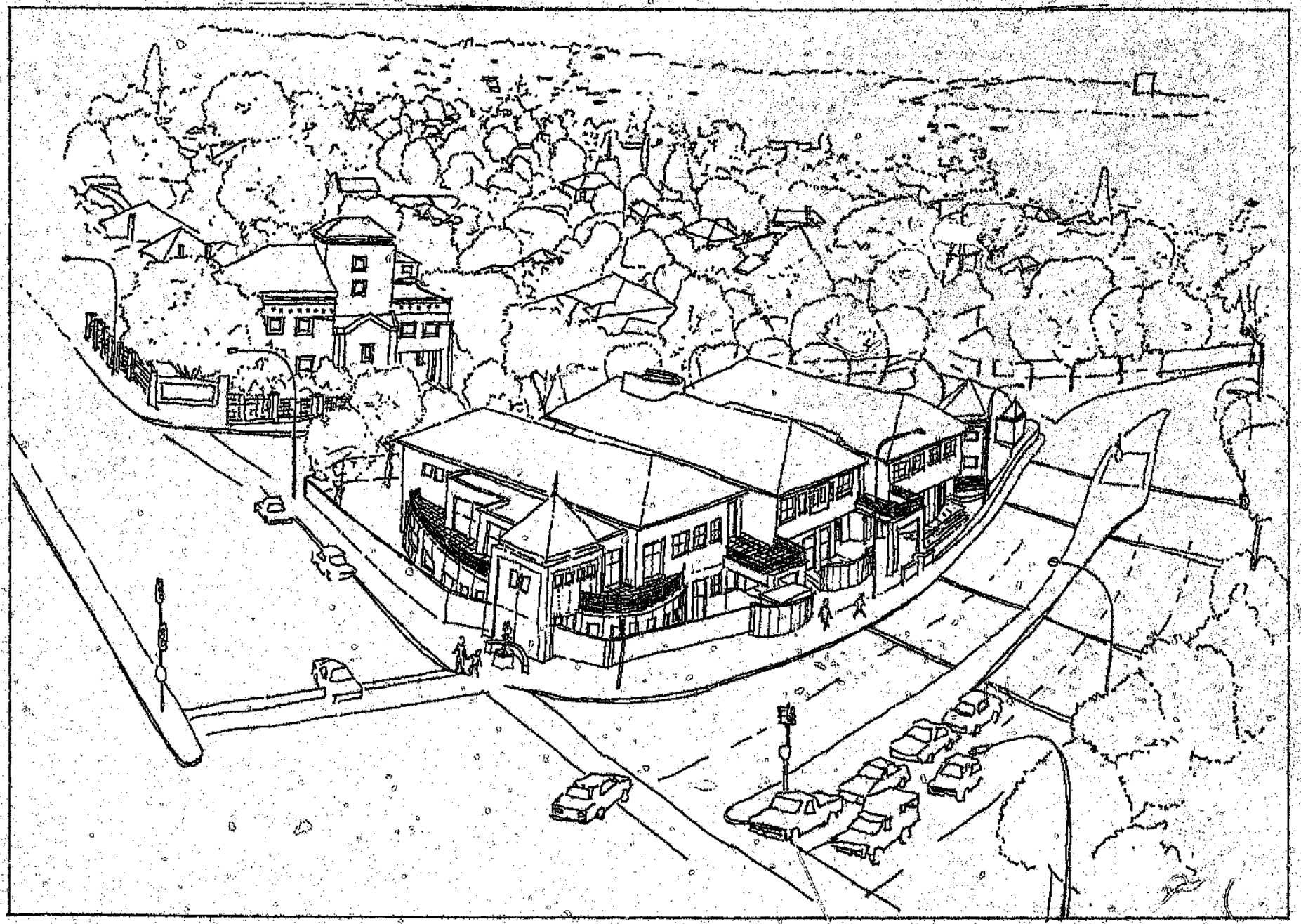


VIEW FROM THE ROAD



VIEW UP BOLTON ROAD

DEVELOPMENT IN CONTEXT



CONTEXTUAL PERSPECTIVE

TRAFFIC FLOW PROJECTIONS AND INFRASTRUCTURE REQUIREMENTS

	RETAIL DVLPMNT SIZE sq.m 100	1800	RETAIL/ COMMERCIAL SIZE sq.m 100	2500	COMMERCIAL DVLPMNT SIZE sq.m 100	2721	HOME OFFICE SIZE sq.m 100	815	PETROL GARAGE SIZE sq.m 100	815	RETAIL/ RESIDENTIAL SIZE sq.m 100	2000	
P.P.D/DAY	8	144	6	200	6	187	8	65	8	65	8	160	PP.P.D/DAY
P.P.D/MONTH		2880		4000		3265		1304		1304		3200	PP.P.D/MONTH
V.P.D/DAY	250	4200	275	6875	3	82	15	122	50	402	50	1000	VP.P.D/DAY
V.P.D/MONTH		84000		137500		1633		2445		8150		20000	VV.P.D/MONTH
SV.P.DAY	1	24	1	24	1	24	0.4	10	1	24	1	24	SSV.P.DAY
SV.P.MONTH		480		480		480		198		480		480	SSV.P.MONTH
BAY AREA	24		24		24		24		24		24		BAY AREA
	prk area /100	no of bay area	prk area /100	no of bay area	prk area /100	no of bay area	prk area /100	no of bay area	prk area /100	no of bay area	prk area /100	no of bay area	
office	0 1	0 0	600 2	25 1250	1959 8	82.278	192 3	84 815	83 3	3 115	0 3	0 0	office
retail	2592 2	108 1800	1800 6	75 1250	0 6	0 0	0 6	0 0	0 6	0 0	1296 6	54 900	retail
showro	0 2	0 0	0 2	0 0	0 2	0 0	0 2	0 0	168 2	7 350	0 2	0 0	showroom
other	0 4	0 0	0 4	0 0	0 4	0 0	0 4	0 0	336 4	14 350	240 4	10 1000	other
prkg bay tot	2592	62 108	2400	51 100	1959	17 81.53	387	84 24.45	587	66 24	1536	62 64	prkg bay totals
internal	1099	1.0 46	1176	0.9 49	1552	0.95 65	17	0.02 1	-1042	-1.28 -43	42	0.04 2	internal
area site	40%	2715 1629	50%	2715 2358	60%	2715 1086	30%	2715 1901	30%	2715 1901	60%	2715 1629	area site
bldg area	2899	1086	3678	1358	4273	1629	832	815	815	815	907	1086	bldg area
FAR	0.66 0.11	1.1	0.92 0.69	1.4	1.00 1.57	1.6	0.30 0.31	0.3	0.20 -0.27	-0.1	0.74 0.14	0.8	FAR
landscaping	5%	136	5%	136	25%	679	49%	1330	10%	272	5%	136	landscaping
height	1.7 0.3	2.2	1.8 1.4	2.7	1.7 2.6	2.6	1.0 1.0	1.0	1.0 -0.9	-0.3	1.0 0.5	1.5	height
covered p	-0.92	-1493	-0.46	-682	1.43	1558	0.01	17	-0.81	-1546	-0.92	-1493	covered p
open p	53% 62	1493	45% 51	1222	15% 17	407	21% 24	570	60% 48	1629	85% 62	1493	open p
street p													street p
private transport													private transport
PERSONS	55%	79.2	45%	120	32%	90	75%	49	65%	42	62%	104	PERSONS
V.PERSONS	90%	5670	85%	5844	96%	78	90%	110	96%	391	86%	860	VV.PERSONS
public transport													public transport
BUS	20%	28.8	15%	30	25%	1.5	10%	0.6	15%	1.2	15%	1.2	BUS
MICRO BUS	10%	14.4	5%	10	5%	0.3	5%	0.3	5%	0.4	5%	0.4	MICRO BUS
TRAIN	5%	7.2	10%	20	10%	0.6	5%	0.3	10%	0.8	10%	0.8	TRAIN
PEDESTRIAN	10%	14.4	5%	10	5%	0.3	5%	0.4	5%	0.4	5%	0.4	PEDESTRIAN
	1		1		1		1		1		1		
private transport	prsn fctor		prsn fctor		prsn fctor		prsn fctor		prsn fctor		prsn fctor		private transport
CARS/PERSONS/DAY	0.70	55	0.30	91	0.70	63	0.70	39	0.70	39	0.70	73	CARS/PERSONS/DAY
CARS/V.PERSONS/DAY	0.55	3119	1.00	5844	1.00	78	1.00	110	1.00	391	1.00	860	CARS/V.P. [illegible]/DAY
JAN SMUTS													JAN SMUTS
EXIST FLOWS		20773		20773		20773			ACCESS/EGRESS				EXIST FLOWS
NEW FLOWS	35%	21892	35%	22851	35%	20823	20773		20773	EXIST FLOWS		20773	NEW FLOWS
							35%	20824	48% 20975	NEW FLOWS	35%	21160	
BOLTON ROAD									BOLTON ROAD				BOLTON ROAD
EXIST FLOWS		11465		11465		11465			ACCESS/EGRESS				EXIST FLOWS
NEW FLOWS	65%	13544	65%	15928	65%	11557	11465		11465	EXIST FLOWS		11465	NEW FLOWS
							65%	11859	48% 11867	NEW FLOWS	65%	12072	
CHESTER ROAD													CHESTER ROAD
ACCESS/EGRESS		2878		5342		129		130		17		840	ACCESS/EGRESS
EXIST FLOWS		2345		2345		2345		2345		2345		2345	EXIST FLOWS
NEW FLOWS	96%	3223	90%	7687	90%	2473	90%	2475	4%	2362	90%	3185	NEW FLOWS

urban design S C A L E	P E R F O R M A N C E						retail dvlp	retail comm	comm dvlp	home offce	ptrol garge	retail res
	1	2	3	4	5	6	1	2	3	4	5	6
does this devlpmnt type accept the concept of scale	C	B	C	E	D	B	67	66	67	69	68	66
is scale relevant to this development type	C	C	C	E	D	C	67	67	67	69	68	67
is scale suitable for this development type	C	C	C	E	D	C	67	67	67	69	68	67
is it feasible for scale in this development type	D	D	D	E	D	C	68	68	68	69	68	67
does this development type contribute to scale	B	C	C	E	E	C	68	67	67	69	69	67
TOTAL	1	2	3	4	5	6	67	67	67	69	68	67

urban design S E N S I T I V I T Y	P E R F O R M A N C E						as is	res comm	comm/ retai	auto town	offi	parki garag
	1	2	3	4	5	6	1	2	3	4	5	6
is there a demand for sensitivity in this dvlpmnt	C	C	C	E	C	B	67	67	67	69	67	66
is there relevance for sensitivity in this dvlpmnt	C	C	C	E	B	C	67	67	67	69	66	67
is it suitable for sensitivity in this dvlpmnt	C	B	C	E	B	B	67	66	67	69	66	66
is it feasible for sensitivity in this dvlpmnt	D	D	D	E	B	C	68	68	68	69	66	67
does this devlpmnt type contribute towards sensitivi	C	B	C	E	A	B	67	66	67	69	65	66
TOTAL	1	2	3	4	5	6	67	67	67	69	66	66

urban design I N T E R G R A T I O N	P E R F O R M A N C E						as is	res comm	comm/ retai	auto town	offi	parki garag
	1	2	3	4	5	6	1	2	3	4	5	6
is there a demand for interg in this development type	B	B	C	E	A	B	66	66	67	69	65	66
is there relevance for inter in this development type	B	B	C	E	A	B	66	66	67	69	65	66
is it suitable for intergrat in this development type	C	C	D	E	B	C	67	67	68	69	66	67

is it feasible to intergrate in this development type	ID	IC	ID	IE	ID	IC	68	67	68	69	66	67
does it contribute to interg in this development type	IC	IC	ID	IE	IA	IB	67	67	68	69	65	66
TOTAL	11	12	13	14	15	16	67	67	68	69	65	66

urban design DESIRABILITY	PERFORMANCE						as is	res comm	comm/ retai	moto town	offi	parki garag
	11	12	13	14	15	16	1	2	3	4	5	6
is there a demand for desirability in this dvlpmnt	ID	ID	ID	ID	IC	ID	68	68	68	68	67	68
is there relevance for this dvlpmnt type to be desirable	ID	ID	ID	ID	IC	ID	68	68	68	68	67	68
is it suitable for this dvlpmnt type to be desirable	ID	ID	ID	ID	IC	IC	68	68	68	68	67	67
is it feasible for this dvlpmnt type to be desirable	ID	IC	ID	IE	IB	IC	68	67	68	69	66	67
does this dvlpmnt type contribute to desirability	ID	ID	ID	ID	IC	ID	68	68	68	68	67	68
TOTAL	11	12	13	14	15	16	68	68	68	68	67	68

urban design IDENTITY	PERFORMANCE						as is	res comm	comm/ retai	moto town	offi	parki garag
	11	12	13	14	15	16	1	2	3	4	5	6
does this dvlpmnt type demon identity	IE	ID	ID	IC	ID	IC	69	68	68	67	68	67
is it relevant for this dvlpmnt type to have identity	IE	ID	ID	IC	ID	IC	69	68	68	67	68	67
is it suitable for this dvlpmnt type to have identity	IE	IE	IE	IE	IE	IE	69	69	69	69	69	69
is it feasible for this dvlp type to have identity	IE	IE	IE	IE	IE	IE	69	69	69	69	69	69
does this dvlpmnt type contribute to identity	IE	ID	IE	ID	ID	IC	69	68	69	68	68	67
TOTAL	11	12	13	14	15	16	69	68	69	68	68	68

urban design	PERFORMANCE	as is	res comm	comm/ retai	moto town	offi	parki

CHARACTER	1	2	3	4	5	6
is there a demand for character in this dvlpmnt ty	C	C	C	C	A	B
is it relevant for this dvlpmnt type to have charact	D	C	C	C	C	C
is it suitable for this dvlpmnt type to have charact	D	C	D	D	C	C
is it feasible for this dvlp type to have character	D	D	D	D	C	C
does this dvlpmnt type contribute to character	D	C	C	D	A	B
TOTAL	11	12	13	14	15	16

	comm 1	retai 2	town 3	4	5	garag 6
is there a demand for character in this dvlpmnt ty	67	67	67	67	65	66
is it relevant for this dvlpmnt type to have charact	68	67	67	67	67	67
is it suitable for this dvlpmnt type to have charact	68	67	68	68	67	67
is it feasible for this dvlp type to have character	68	68	68	68	67	67
does this dvlpmnt type contribute to character	68	67	67	68	65	66
TOTAL	68	67	67	68	66	67

urban design VIEW FROM THE ROAD	P E R F O R M A N C E 1	2	3	4	5	6
is there a demand for this dvlpmnt to be viewed from th	E	D	D	C	E	D
is there relevance for this dvlpmnt to be viewed from th	E	D	C	C	E	D
is it suitable for this dvlpmnt to be viewed from th	E	E	E	E	E	E
is it feasible for this dvlpmnt to be viewed from th	E	E	E	E	E	E
does it contribute to the view from the road	D	D	D	C	B	D
TOTAL	11	12	13	14	15	16

as is 1	res comm 2	comm/ retai 3	moto town 4	offi 5	parki garag 6
69	68	68	67	69	68
69	68	67	67	69	68
69	69	69	69	69	69
69	69	69	69	69	69
68	68	68	67	66	68
69	68	68	68	68	68

urban design VISUAL INTEREST	P E R F O R M A N C E 1	2	3	4	5	6
does this dvlpmnt type demand visual interest	D	D	C	C	B	C
is visual interest relevant to this dvlpmnt type	D	C	C	C	B	C
is this dvlpmnt type suitabl	E	D	D	C	A	C

as is 1	res comm 2	comm/ retai 3	moto town 4	offi 5	parki garag 6
68	68	67	67	66	67
68	67	67	67	66	67
69	68	68	67	65	67

is this development type												
are controls relevent to this development type	ID	ID	ID	IC	ID	ID	68	68	68	67	68	68
are controls suitable to this development type	ID	ID	ID	IC	IC	ID	68	68	68	67	67	68
are controls feasible to this development type	ID	ID	ID	IC	IB	ID	68	68	68	67	66	68
would controls contribute to this development type	IE	IE	IE	IC	IB	IE	69	69	69	67	66	67
TOTAL	11	12	13	14	15	16	68	68	68	67	66	68

urban design ORIENTATION	P E R F O R M A N C E						as is	res comm	comm/ retai	moto town	offi	parki garag
	11	12	13	14	15	16	1	2	3	4	5	6
is there a demand for orientation this dvlpmnt typ	IE	IC	IA	IB	IC	IC	69	67	65	66	67	67
is orientation relevant in this devlpmnt type	IC	IC	IB	IB	ID	IC	67	67	66	66	68	67
is it suitable for this dvlpmnt type to have orientat	IE	IE	IE	IE	IE	IE	69	69	69	69	69	69
is it feasible for this dvlpmnt type to have orienta	IE	IE	IE	IE	IE	IE	69	69	69	69	69	69
does this dvlpmnt type contribute to orientation	IE	ID	IC	IB	ID	IC	69	68	67	66	68	67
TOTAL	11	12	13	14	15	16	69	68	67	67	68	68

urban design LANDSCAPE	P E R F O R M A N C E						as is	res comm	comm/ retai	moto town	offi	parki garag
	11	12	13	14	15	16	1	2	3	4	5	6
is there a demand for lansca in this development type	IB	IB	IC	ID	IA	IA	66 5	66	67	68	65	65
is landscaping relevant in this development type	IC	IC	ID	ID	IA	IB	67 5	67	68	68	65	66
is landscaping suitable in this development type	IC	IC	IC	IC	IB	IB	67 5	67	67	67	66	66
is landscaping feasible in this development type	IC	IC	IC	IC	IB	IB	67 50	67	67	67	66	66
doe this dvlpmnt type contribute to landscaping	IB	IB	ID	ID	IA	IB	66 67	66	68	68	65	66

is this development type											
are controls relevant to this development type	ID	ID	IB	IC	ID	ID	68	68	68	67	68	68
are controls suitable to this development type	ID	ID	ID	IC	IC	ID	68	68	68	67	67	68
are controls feasible to this development type	ID	ID	ID	IC	IB	ID	68	68	68	67	66	68
would controls contribute to this development type	IE	IE	I2	IC	IB	IE	69	69	69	67	66	69
TOTAL	11	12	13	14	15	16	68	68	68	67	66	68

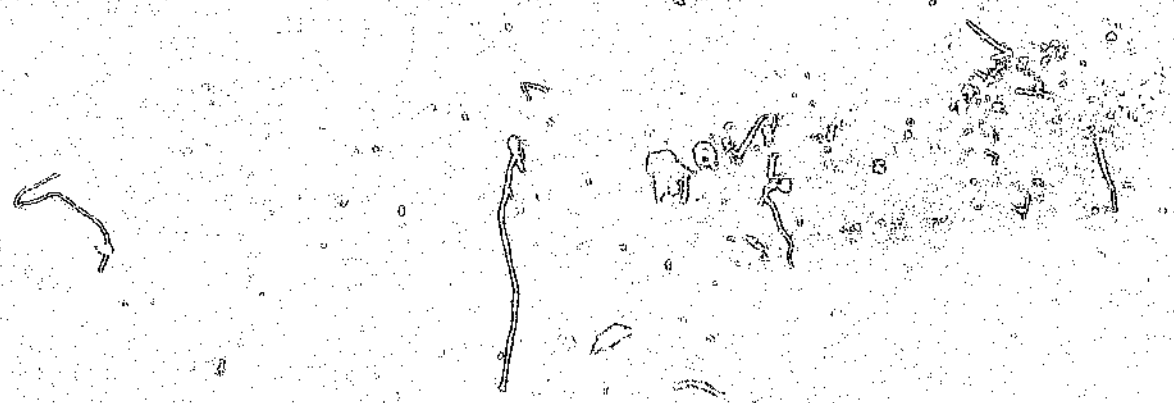
urban design ORIENTATION	PERFORMANCE						as is	res comm	comm/ retai	moto town	offi	parki garag
	11	12	13	14	15	16	1	2	3	4	5	6
is there a demand for orientation this dvlpmnt typ	IE	IC	IA	IB	IC	IC	69	67	65	66	67	67
is orientation relevant in this devlpmnt type	IC	IC	IB	IB	ID	IC	67	67	66	66	68	67
is it suitable for this dvlpmnt type to have orienta	IE	IE	IE	IE	IE	IE	69	69	69	69	69	69
is it feasible for this dvlpmnt type to have orienta	IE	IE	IE	IE	IE	IE	69	69	69	69	69	69
does this dvlpmnt type contribute to orientation	IE	ID	IC	IB	ID	IC	69	68	67	66	68	67
TOTAL	11	12	13	14	15	16	69	68	67	67	68	68

urban design LANDSCAPE	PERFORMANCE						as is	res comm	comm/ retai	moto town	offi	parki garag
	11	12	13	14	15	16	1	2	3	4	5	6
is there a demand for landsca in this development type	IB	IB	IC	ID	IA	IA	66 5	66	67	68	65	65
is landscaping relevant in this development type	IC	IC	ID	ID	IA	IB	67 5	67	68	68	65	66
is landscaping suitable in this development type	IC	IC	IC	IC	IB	IB	67 5	67	67	67	66	66
is landscaping feasible in this development type	IC	IC	IC	IC	IB	IB	67 50	67	67	67	66	66
doe this dvlpmnt type contribute to landscaping	IB	IB	ID	ID	IA	IB	66 67	66	68	68	65	66

ANALYSIS MATRIX

DESIGN PRINCIPLES/DEVELOP

	1	2	3	4	5	6	7	8
SCALE	67	67	67	69	68	67	0	0
SENSITIVITY	67	67	67	69	66	66	0	0
INTEGRATION	67	67	68	69	65	66	0	0
DESIRABILITY	68	68	68	68	67	68	0	0
IDENTITY	69	68	69	68	68	68	0	0
CHARACTER	68	67	67	68	66	67	0	0
VIEWS FROM THE ROAD	69	68	68	68	68	68	0	0
VISUAL INTEREST	69	68	67	67	66	67	0	0
AMENITY/COMFORT	68	67	67	67	67	67	0	0
ARCHITECTURAL RESPONSE	68	68	68	67	67	67	0	0
CONTROLS	68	68	68	67	66	68	0	0
ORIENTATION	69	68	67	67	68	68	0	0
LANDSCAPE	67	67	67	68	65	66	0	0
ROBUST & FLEXIBILITY	68	68	67	66	65	67	0	0
DISTRICT CONTRIBUTION	68	68	68	67	67	67	0	0
	1018	1012	1014	1015	1000	1006	0	0



PARKWOOD

land use VIABILITY	PERFORMANCE 1	2	3	4	5	6	retail dvlp 1	retailcomm dvlp 2	home dvlp 3	ptrol office 4	retail garge 5	res 6
is there a demand for this development type	C	C	C	D	D	B	67	67	67	68	68	66
is there relevance for this development type	C	C	B	D	D	B	67	67	68	68	68	66
is it suitable for this development type	C	D	D	E	D	B	67	68	68	69	68	66
is it feasible for this development type	C	D	D	C	D	B	67	68	68	67	68	66
does this development type contribute to viability	C	D	D	D	D	B	67	68	68	68	68	66
TOTAL	1	2	3	4	5	5	67	68	68	68	68	66

land use FEASIBILITY	PERFORMANCE 1	2	3	4	5	6	retail dvlp 1	retailcomm dvlp 2	home dvlp 3	ptrol office 4	retail garge 5	res 5
is there a demand for this development type	D	D	C	D	D	B	68	68	67	68	68	66
is there relevance for this development type	C	D	D	C	D	C	67	68	68	67	68	67
is it suitable for this development type	C	C	D	B	D	B	67	67	68	66	68	66
is it feasible for this development type	C	C	D	B	D	B	67	67	68	66	68	66
does this development type contribute to feasibility	C	D	D	B	D	C	67	68	68	66	68	67
TOTAL	1	2	3	4	5	5	67	68	68	67	68	66

land use LOCATION	PERFORMANCE 1	2	3	4	5	5	retail dvlp 1	retailcomm dvlp 2	home dvlp 3	ptrol office 4	retail garge 5	res 5
is there a demand for locati in this development type	E	E	D	C	E	D	69	69	68	67	69	68
is the location relevant for this development type	C	D	D	C	D	B	67	68	68	67	68	66
is it a suitable location for this development type	C	C	D	B	D	B	67	67	68	66	68	66
is it a feasible location	C	B	D	D	E	B	67	66	68	68	69	66

for this development type												

PARKWOOD

does the development type contribute to the location	D	C	C	B	B	B	68	67	67	66	66	66
TOTAL	1	2	3	4	5	5	68	67	68	67	68	66

land use LETABILITY	P E R F O R M A N C E						retail dvlp	retail comm	comm dvlp	home office	ptrol garge	retail res
	1	2	3	4	5	5	1	2	3	4	5	5
is there a demand for this development type	C	D	C	D	E	B	67	68	67	68	69	66
is there relevance for this development type	C	D	D	D	D	B	67	68	68	68	68	66
is it suitable for letability for this dvlpmnt	C	D	E	E	E	C	67	68	69	69	69	67
is it feasible for letability for this dvlpmnt	C	D	D	D	E	B	67	68	68	68	69	66
does it contribute to letability for this dvlpmnt	D	D	D	D	D	B	68	68	68	68	68	66
TOTAL	1	2	3	4	5	5	67	68	69	68	69	66

land use ACCESS AND CIRCULATION	P E R F O R M A N C E						retail dvlp	retail comm	comm dvlp	home office	ptrol garge	retail res
	1	2	3	4	5	5	1	2	3	4	5	5
is a&c a demand for this development type	A	A	C	E	E	B	65	65	67	69	69	66
is a&c relevance for this development type	C	C	C	C	C	C	67	67	67	67	67	67
is a&c suitable for this development type	A	A	D	E	D	B	65	65	68	69	68	66
is a&c feasible for this development type	B	B	E	E	E	B	66	66	69	69	69	66
does a&c contribute to this development type	E	E	E	E	E	E	69	69	69	69	69	69
TOTAL	1	2	3	4	5	5	66	66	68	69	68	67

land use FLEXIBILITY	P E R F O R M A N C E						retail dvlp	retail comm	comm dvlp	home office	ptrol garge	retail res

	1	2	3	4	5	6
is there a demand for flexibility in this dvlpmnt	B	B	B	D	B	B
	66	66	66	68	68	66
is there relevance for flexibility in this dvlpmnt	C	C	C	C	C	C
	67	67	67	67	67	67

PARKWOOD

	1	2	3	4	5	6
is it suitable for flexibility in this dvlpmnt	B	A	B	E	B	A
	66	65	68	69	68	65
is it feasible for flexibility in this dvlpmnt	C	B	D	E	E	B
	67	66	68	69	69	66
does it contribute to flexibility in this dvlpmnt	A	A	B	D	D	A
	65	65	66	68	68	65
TOTAL	1	2	3	4	5	6
	66	66	67	68	68	66

land use PARKING	PERFORMANCE 1	2	3	4	5	6
	retail dvlp	retail comm	comm dvlp	home offce	ptrol garge	retail res
is there a demand for parking in this development type	A	A	C	E	E	B
	65	65	67	69	69	66
is there relevance for parking in this development type	A	A	A	D	E	A
	65	65	65	68	69	65
is it suitable for parking in this development type	B	B	D	E	E	B
	66	66	68	69	69	66
is it feasible for parking in this development type	C	C	D	E	E	C
	67	67	68	69	69	67
does it contribute to parking in this development type	A	A	A	D	E	A
	65	65	65	68	69	65
TOTAL	1	2	3	4	5	6
	66	66	67	69	69	66

land use VISIBILITY	PERFORMANCE 1	2	3	4	5	6
	retail dvlp	retail comm	comm dvlp	home offce	ptrol garge	retail res
is there a demand for visibility in this dvlpmnt	E	E	D	C	E	C
	69	69	68	67	69	67
is there relevance for visibility in this dvlpmnt	C	C	C	C	C	C
	67	67	67	67	67	67
is it suitable for visibility in this dvlpmnt	E	E	E	E	E	D
	69	69	69	69	69	68

Is it feasible to obtain visibility in this dvlpmnt t	E	E	E	E	E	E	69	69	69	69	69	69
does it contribute to visibility in this dvlpmnt t	E	E	E	C	C	C	69	69	69	67	67	67
TOTAL	1	2	3	4	5	5	69	69	68	68	68	68

land use IMAGEABILITY	P E R F O R M A N C E						retail dvlp 1	retail comm 2	comm dvlp 3	home office 4	petrol garge 5	retail res 5
	1	2	3	4	5	5						

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is there a demand for imagea for this development type	E	E	E	D	E	D	69	69	69	68	69	68
is there relevance for image for this development type	E	E	E	E	E	D	69	69	69	69	69	68
is it suitable for imageabil for this development type	E	E	E	E	E	D	69	69	69	69	69	68
is it feasible to obtain ima for this development type	E	E	F	E	E	E	69	69	69	69	69	69
does it contribute to imagea for this development type	E	E	D	D	B	C	67	69	68	68	66	67
TOTAL	1	2	3	4	5	5	69	69	69	69	68	68

land use COMPATIBILITY	P E R F O R M A N C E						retail dvlp 1	retail comm 2	comm dvlp 3	home office 4	petrol garge 5	retail res 5
	1	2	3	4	5	6						
is there a demand for compatibility in this dvlpmn	B	D	B	E	A	C	66	66	66	69	65	67
is there relevance for compatibility in this dvlpmn	D	D	D	D	D	D	68	68	68	68	68	68
is it suitable for compatibility in this dvlpmn	D	D	D	E	B	D	68	68	68	69	64	68
is it feasible for compatibility in this dvlpmn	D	D	D	E	B	C	68	68	68	69	66	67
does it contribute to compatibility in this dvlpmn	C	C	C	E	A	C	67	67	67	69	65	67
TOTAL	1	2	3	4	5	5	67	67	67	69	66	67

land use	P E R F O R M A N C E						retail dvlp	retail comm	comm dvlp	home office	petrol garge	retail res
	1	2	3	4	5	5	1	2	3	4	5	5

PRESENT POLICY	1	2	3	4	5	6
are there pressures on p. po	B	B	C	E	A	B
for this development type						
is there relevance in p. pol	A	A	B	E	A	A
for this development type						
is it suitable for p. policy	C	C	C	E	A	B
to incl this development typ						
is it feasible for p. policy	B	D	D	E	D	C
to accept this development t						
does this development type	A	A	B	E	A	A
contribute to present policy						
TOTAL	1	2	3	4	5	5

dvlp	comm	dvlp	office	garge	res
1	2	3	4	5	6
66	66	67	69	65	66
65	65	66	69	65	65
67	67	67	69	65	66
69	68	68	69	68	67
65	65	66	69	65	65
66	66	67	69	66	66

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ANALYSIS MATRIX

LANDUSE

	1	2	3	4	5	6	7	8	9	10
VIABILITY	67	68	68	68	68	66	0	0	0	0
FEASIBILITY	67	68	68	67	68	66	0	0	0	0
LOCATION	68	67	68	67	68	66	0	0	0	0
LETABILITY	67	68	68	68	69	66	0	0	0	0
ACCESS AND CIRCULATION	66	66	68	69	69	67	0	0	0	0
FLEXIBILITY	66	66	67	68	68	66	0	0	0	0
PARKING	66	66	67	69	69	68	0	0	0	0
VISIBILITY	69	69	68	68	68	68	0	0	0	0
IMAGEABILITY	69	69	69	69	68	68	0	0	0	0
COMPATIBILITY	67	67	67	69	66	67	0	0	0	0
PRESENT POLICY	66	66	67	69	66	66	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	738	740	744	749	746	732	0	0	0	0

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traffic & infra PUBLIC PARKING	PERFORMANCE 1	2	3	4	5	6	retai dvlp 1	retailcomm dvlp 2	home dvlp 3	ptrol offce 4	retail garge 5	retail res 6
is there a demand for pblc parking in this dvlpmt type	A	A	D	E	E		65	65	68	69	69	67
is there relevance for pblc parking in this dvlpmt type	A	A	B	D	D	B	65	65	66	68	68	66
is it suitable for pblc parking in this dvlpmt type	A	A	C	E	D	B	65	65	67	69	68	66
is it feasible for public parking in this dvlpmt type	B	B	D	E	E	B	66	66	68	69	69	66
does the dvlpmt type contrib to the need for public prkng	A	A	C	E	E	B	65	65	67	69	69	66
TOTAL	1	2	3	4	5	6	65	65	67	69	69	66

traffic & infra PRIVATE PARKING	PERFORMANCE 1	2	3	4	5	6	retai dvlp 1	retailcomm dvlp 2	home dvlp 3	ptrol offce 4	retail garge 5	retail res 6
is there a demand for priv parking in this dvlpmt type	C	B	A	D	D	B	67	66	65	68	68	66
is there relevance for priv parking in this dvlpmt type	C	B	A	D	D	B	67	66	65	68	68	66
is it suitable for private parking in this dvlpmt type	C	C	C	E	E	B	67	67	67	69	69	66
is it feasible for private parking in this dvlpmt type	D	C	C	E	E	B	68	67	67	69	69	66
does the dvlpmt type contrib to the need for priv prkng	C	B	A	C	D	B	67	66	65	67	68	66
TOTAL	1	2	3	4	5	6	67	66	66	68	68	66

traffic & infra No of PARKING BAYS over fifty bays	PERFORMANCE 1	2	3	4	5	6	retai dvlp 1	retailcomm dvlp 2	home dvlp 3	ptrol offce 4	retail garge 5	retail res 6
is there a demand for p bays in this development type	A	A	B	E	E	D	65	65	66	69	69	68
is there relevance for p bays in this development type	A	A	B	E	E	C	65	65	66	69	69	67
is it suitable for p bays in this development type	A	A	B	E	E	B	65	65	66	69	69	66

is it feasible for p bays in this development type	B	B	D	E	E	D		66	66	68	69	67	68

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does the dvlpmt type contrib to the need for prkng bays	A	B	C	D	E	C		65	66	67	68	68	67
TOTAL	1	2	3	4	5	6		65	65	67	69	69	67

traffic & infra ACCESS/EGRESS-SITE	P E R F O R M A N C E						retai dvlp 1	retailcomm comm 2	home dvlp 3	ptrol offce 4	garge 5	retail res 6
	1	2	3	4	5	6						
is there a deaand for major a&e in this dvlpmnt type	A	A	D	E	A	B		65	65	68	69	65	66
is there relevance for major a&e in this dvlpmnt type	A	B	C	D	A	B		65	66	67	68	65	66
is it suitable for major a&e in this dvlpmnt type	B	B	C	D	C	B		66	66	67	68	67	66
is it feasible for major a&e in this dvlpmnt type	C	C	E	E	D	C		67	67	69	69	68	67
does it contribute to major a&e in this dvlpmnt type	A	B	C	E	A	B		65	66	67	69	65	66
TOTAL	1	2	3	4	5	6		66	66	68	69	66	66

traffic & infra PEDESTRIAN ACTIVITY	P E R F O R M A N C E						retai dvlp 1	retailcomm comm 2	home dvlp 3	ptrol offce 4	garge 5	retail res 6
	1	2	3	4	5	6						
is there a deaand for ped ac in this development type	A	B	D	E	D	B		65	66	68	69	68	66
is there relevance for ped a in this development type	B	C	D	E	D	B		66	67	68	69	68	66
is it suitable for ped actv in this development type	B	B	C	D	D	B		66	66	67	68	68	66
is it feasible for ped actv in this development type	B	B	C	D	D	B		66	66	67	68	68	66
does the dvlpmt type contri to pedes activity	A	B	D	E	C	C		65	65	68	69	67	67
TOTAL	1	2	3	4	5	6		66	66	68	69	68	66

traffic & infra TRAFFIC CIRCULATION	P E R F O R M A N C E						retai dvlp	retailcomm comm	home dvlp	ptrol offce	garge	retail res

	1	2	3	4	5	6
is there a demand for traff circ in this dvlpmnt t	1A	1A	1D	1D	1A	1B
is there relevance for traff circ in this dvlpmnt t	1A	1A	1D	1E	1A	1B

	retai dvlp 1	retail comm 2	comm dvlp 3	home offce 4	ptrol garge 5	retail res 6
is there a demand for traff circ in this dvlpmnt t	65	65	66	68	65	66
is there relevance for traff circ in this dvlpmnt t	65	65	68	69	65	66

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	1	2	3	4	5	6
is it suitable for traff circ in this dvlpmnt t	1B	1B	1D	1D	1D	1C
is it feasible for traff circ in this dvlpmnt t	1B	1B	1C	1D	1E	1B
does the dvlpmnt type contri to traff circulation	1A	1A	1C	1C	1D	1D
TOTAL	1	2	3	4	5	6

	retai dvlp 1	retail comm 2	comm dvlp 3	home offce 4	ptrol garge 5	retail res 6
is it suitable for traff circ in this dvlpmnt t	66	66	68	68	68	67
is it feasible for traff circ in this dvlpmnt t	66	66	67	68	69	66
does the dvlpmnt type contri to traff circulation	65	65	67	67	68	66
TOTAL	65	65	67	68	67	66

traffic & infra FUTURE DEMAND — PERFORMANCE	1	2	3	4	5	6
is there a future demand in this development type	1B	1B	1C	1D	1D	1B
is future demand relevant in this development type	1B	1B	1C	1D	1D	1B
is it suitable for f dem nd in this development type	1B	1C	1D	1D	1D	1C
is it feasible for future de in this development type	1D	1C	1D	1D	1D	1C
does it contribute to f dema in this development type	1B	1B	1C	1D	1D	1C
TOTAL	1	2	3	4	5	6

	retai dvlp 1	retail comm 2	comm dvlp 3	home offce 4	ptrol garge 5	retail res 6
is there a future demand in this development type	66	66	67	68	68	66
is future demand relevant in this development type	66	66	67	68	68	66
is it suitable for f dem nd in this development type	66	67	68	68	68	67
is it feasible for future de in this development type	66	67	68	68	68	67
does it contribute to f dema in this development type	66	66	67	68	68	67
TOTAL	66	66	67	68	68	67

traffic & infra DEVELOPMENT POPULATION — PERFORMANCE	1	2	3	4	5	6
is there a demand for a major devop pop in this dvlp	1C	1B	1A	1C	1D	1B
is there relevance for a major devop pop in this dvlp	1C	1B	1A	1C	1D	1B
is it suitable for a major devop pop in this dvlp	1C	1C	1C	1C	1D	1B
is it feasible for major devop pop in this dvlp	1E	1D	1C	1E	1E	1B

	retai dvlp 1	retail comm 2	comm dvlp 3	home offce 4	ptrol garge 5	retail res 6
is there a demand for a major devop pop in this dvlp	67	66	65	67	68	66
is there relevance for a major devop pop in this dvlp	67	66	65	67	68	66
is it suitable for a major devop pop in this dvlp	67	67	67	67	68	66
is it feasible for major devop pop in this dvlp	69	68	67	69	69	68

major development population						
TOTAL	11	12	13	14	15	16

	68	67	66	68	68	66

traffic & infra VISITORS TO DEVELOPMENT	PERFORMANCE					
	11	12	13	14	15	16

retai dvlp	retail comm	comm dvlp	home offce	ptrol garge	retail res
1	2	3	4	5	6

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is there a demand for visito in this development type	A	B	C	D	A	B
is there relevance for visit in this development type	A	B	C	C	A	C
is it suitable for visitors in this development type	B	B	C	D	D	B
is it feasible for visitors in this development type	B	C	D	E	E	C
does it contribute to visito in this development type	A	B	C	D	A	B
TOTAL	11	12	13	14	15	16

	65	66	67	68	65	66
	65	66	67	67	65	67
	66	66	67	68	68	66
	66	67	68	69	69	67
	65	66	67	68	65	66
	65	66	67	68	66	66

traffic & infra SERVICE VEHICLES	PERFORMANCE					
	11	12	13	14	15	16
is there a demand for ser vehicles in this dvlpmnt	A	B	D	D	B	C
is there relevance for ser vehicles in this dvlpmnt	A	B	D	D	B	B
is it suitable for ser vehicles in this dvlpmnt	A	A	D	D	D	B
is it feasible for ser vehicles in this dvlpmnt	A	B	D	D	D	B
does it contribute to ser vehicles in this dvlpmnt	A	B	D	C	B	B
TOTAL	11	12	13	14	15	16

retai dvlp	retail comm	comm dvlp	home offce	ptrol garge	retail res
1	2	3	4	5	6
65	66	68	68	66	67
65	66	68	68	66	66
65	65	68	68	68	66
65	66	68	68	68	66
65	66	68	69	67	66
65	66	68	68	67	66

traffic & infra SERVICES	PERFORMANCE					
	11	12	13	14	15	16
is there a demand for serv in this development type	B	B	B	E	C	B
is there relevance for serv in this development type	B	B	B	D	C	B

retai dvlp	retail comm	comm dvlp	home offce	ptrol garge	retail res
1	2	3	4	5	6
66	66	66	69	67	66
66	66	66	68	67	66

is it suitable for services in this development type	ID	ID	ID	ID	ID	ID	68	68	68	68	68	68
is it feasible for services in this development type	ID	ID	ID	ID	ID	ID	68	68	68	68	68	68
does it contribute to need services in this dvlpmt typ	IA	IB	ID	ID	ID	IB	65	66	66	68	68	66
TOTAL	11	12	13	14	15	16	67	67	67	68	68	67

PARKWOOD

traffic & infra EXISTING INFRASTRUCTURE	P E R F O R M A N C E						retai dvlp 1	retailcomm dvlp 2	home office 3	ptrol garge 4	retail res 5	6
	11	12	13	14	15	16						
is there a demand on exist infr in this dvlpmnt t	IB	IB	ID	ID	ID	IB	68	66	66	68	68	66
is there relevance for exist infr in this dvlpmnt t	IB	IB	IB	ID	ID	IB	66	66	66	68	68	66
is it suitable for exist infr in this dvlpmnt t	IC	IC	IC	ID	IC	IC	67	67	67	68	67	67
is it feasible for exist infr in this dvlpmnt t	ID	ID	ID	ID	ID	ID	68	68	68	68	68	68
does exist infra contribute adequately for this dvlpmnt	ID	ID	IB	ID	ID	ID	68	68	68	68	68	68
TOTAL	11	12	13	14	15	16	67	67	67	68	68	67

ANALYSIS MATRIX

T R A F F I C & I N F R A S T R U C T U R E

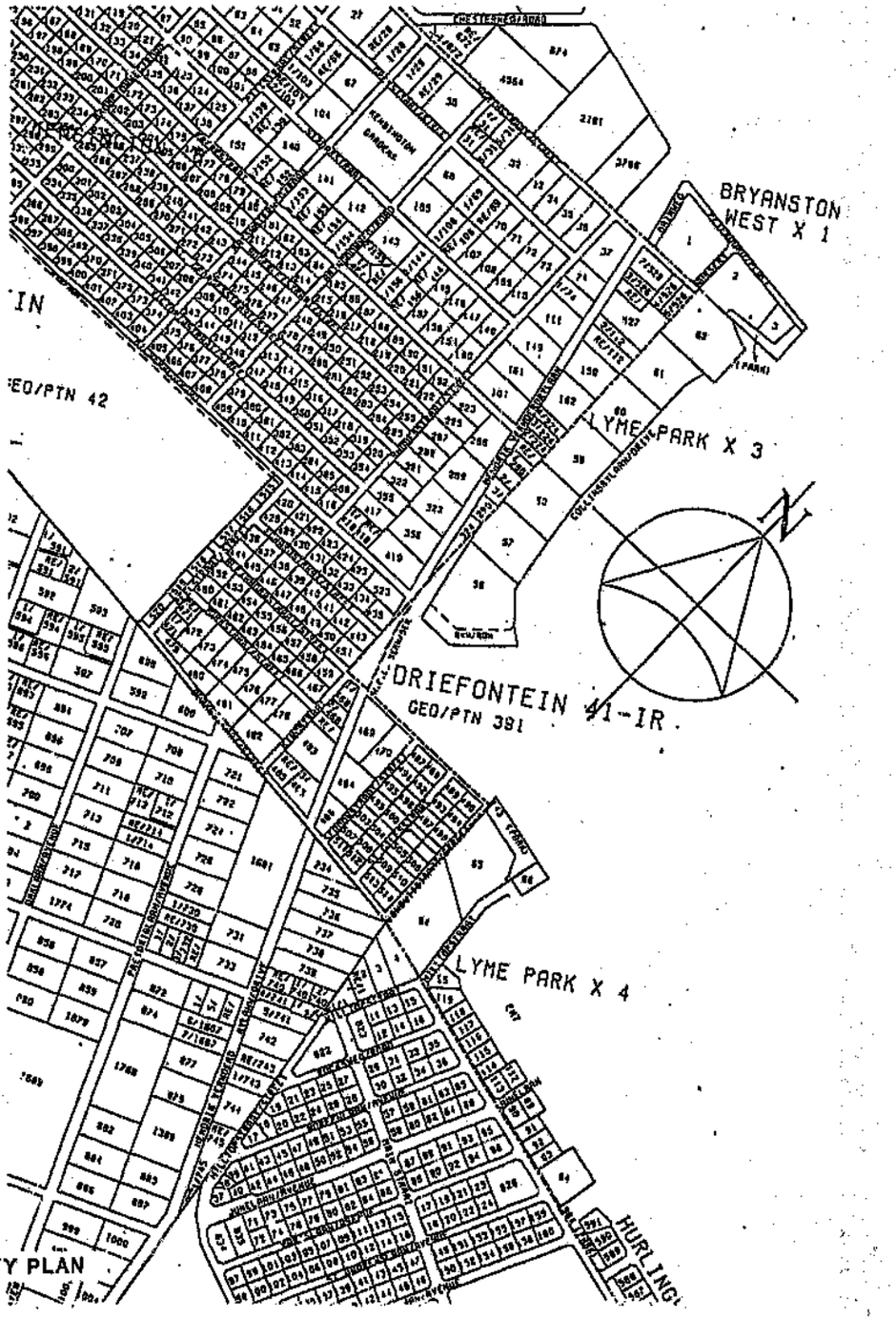
	1	2	3	4	5	6	7	8	9	10
PUBLIC PARKING	65	65	67	69	69	66	0	0	0	0
PRIVATE PARKING	67	66	66	68	68	66	0	0	0	0
No of PARKING BAYS	65	65	67	69	69	67	0	0	0	0
ACCESS/EGRESS-SITE	66	66	68	69	66	66	0	0	0	0
PEDESTRIAN ACTIVITY	66	66	68	69	68	66	0	0	0	0
TRAFFIC CIRCULATION	65	65	67	68	67	66	0	0	0	0
FUTURE DEMAND	66	66	67	68	68	67	0	0	0	0
DEVELOPMENT POPULATION	68	67	66	68	68	66	0	0	0	0
VISITORS TO DEVELOPMEN	65	66	67	68	66	66	0	0	0	0
SERVICE VEHICLES	65	66	68	68	67	66	0	0	0	0
SERVICES	67	67	67	68	68	67	0	0	0	0
EXISTING INFRASTRUCTUR	67	67	67	68	68	67	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	792	793	804	819	812	797	0	0	0	0

TRAFFIC FLOW PROJECTIONS AND INFRASTRUCTURE REQUIREMENTS

	RETAIL DVLPMNT SIZE sq.m 100 1800		RETAIL/ COMMERCIAL SIZE sq.m 100 2500		COMMERCIAL DVLPMNT SIZE sq.m 100 2721		HOME OFFICE SIZE sq.m 100 815		PETROL GARAGE SIZE sq.m 100 815		RETAIL/ RESIDENTIAL SIZE sq.m 100 2000		
P.P.D/DAY	8	144	8	200	6	163	8	65	8	65	8	160	P.P.D/DAY
P.P.D/MONTH		2880		4000		3265		1304		1304		3200	P.P.D/MONTH
V.P.D/DAY	350	6300	275	6875	3	82	15	122	50	408	50	1000	V.P.D/DAY
V.P.D/MONTH		126000		137500		1223		2445		8160		20000	V.P.D/MONTH
SV.P.DAY	1	24	1	24	1	24	0.4	10	1	24	1	24	SV.P.DAY
SV.P.MONTH		480		480		480		192		480		480	SV.P.MONTH
BAY AREA	24		24		24		24		24		24		BAY AREA
	prk area /100 no of bay area		prk area /100 no of bay area		prk area /100 no of bay area		prk area /100 no of bay area		prk area /100 no of bay area		prk area /100 no of bay area		
office	0 3 0 0		600 8 25 1250		1959 3 82 2721		587 2 24 815		83 2 3 115		0 3 0 0		lotfire
retail	2592 6 108 1800		1800 6 75 1850		0 6 0 0		0 6 0 0		0 6 0 0		1296 6 54 900		lretail
showrm	0 2 0 0		0 2 0 0		0 2 0 0		0 2 0 0		188 2 7 350		0 2 0 0		lshowrm
other	0 4 0 0		0 4 0 0		0 4 0 0		0 4 0 0		336 4 14 350		240 1 10 1000		lother
prkg bay tot	2592 62 108		2400 51 100		1959 17 81.63		587 24 24.45		587 68 24		1536 62 64		lprkg bay totals
internal	1099 3.0 46		1176 0.9 49		1552 0.95 65		17 0.02 1		-1042 -1.28 -43		63 0.04 2		linternal
area mix	40% 2715 1629		50% 2715 1358		60% 2773 1664		30% 2715 1901		30% 2715 1901		40% 2715 1629		larea mix
bldg area	2899	1086	3678	1358	4273	1629	832	815	815	815	2607	1086	lbldg area
FAR	0.66 0.11	1.1	0.92 0.69	1.4	1.60 1.57	1.6	0.30 0.31	0.3	0.30 -0.27	-0.1	0.74 0.19	0.9	lFAR
landscaping	5%	136	5%	136	25%	679	49%	1330	10%	272	5%	136	llandscaping
height	1.7 0.3	2.7	1.8 1.4	2.7	1.7 2.6	2.6	1.0 1.0	1.0	1.0 -0.9	-0.3	1.8 0.5	1.9	lheight
covered p	-0.92	-1493	-0.46	-622	1.43	1552	0.01	17	-0.81	-1546	-0.92	-1493	lcovered p
open p	55% 62	1493	45% 51	1222	15% 17	407	21% 24	570	60% 68	1627	55% 62	1493	lopen p
street p													lstreet p
private transport													lprivate transport
PERSONS	85% 79.3		65% 130		55% 90		75% 49		65% 42		85% 104		lPERSONS
V.PERSONS	90% 5670		85% 5844		95% 78		90% 110		96% 391		64% 860		lV.PERSONS
public transport													lpublic transport
BUS	20% 28.8		15% 30		25% 1.5		10% 0.8		15% 1.2		15% 1.2		lBUS
MICRO BUS	10% 14.4		5% 10		5% 0.3		5% 0.4		5% 0.4		5% 0.4		lMICRO BUS
TRAIN	5% 7.2		10% 20		10% 0.6		5% 0.4		10% 0.8		10% 0.8		lTRAIN
PEDESTRIAN	10% 14.4		5% 10		5% 0.3		5% 0.4		5% 0.4		5% 0.4		lPEDESTRIAN
	1		1		1		1		1		1		
private transport	prsn fctor		prsn fctor		prsn fctor		prsn fctor		prsn fctor		prsn fctor		lprivate transport
CARS/PERSONS/DAY	0.70 55		0.70 91		0.70 63		0.70 34		0.70 30		0.70 73		lCARS/PERSONS/DAY
CARS/V.PERSONS/DAY	0.55 3119		1.00 5844		1.00 78		1.00 110		1.00 391		1.00 860		lCARS/V.PERSONS/DAY
JAN SKUTS									ACCESS/EGRESS				lJAN SKUTS
EXIST FLOWS		20773		20773		20773		20772	20773	EXIST FLOWS		20773	lEXIST FLOWS
NEW FLOWS	35% 21892		35% 22851		35% 20823		35% 20824		48% 20975	NEW FLOWS	33% 21104		lNEW FLOWS
									BOLTON ROAD				
BOLTON ROAD									ACCESS/EGRESS				lBOLTON ROAD
EXIST FLOWS		11465		11465		11465		11465	11465	EXIST FLOWS		11465	lEXIST FLOWS
NEW FLOWS	65% 12544		65% 15823		65% 11557		65% 11559		48% 11667	NEW FLOWS	65% 18072		lNEW FLOWS
CHESTER ROAD													lCHESTER ROAD
ACCESS/EGRESS		2878		5368		128		130		17		840	lACCESS/EGRESS
EXIST FLOWS		2345		2345		2345		2345		2345		2345	lEXIST FLOWS
NEW FLOWS	90% 6223		90% 7687		90% 2478		90% 2478		4% 2362		90% 3106		lNEW FLOWS

CASE STUDY 2

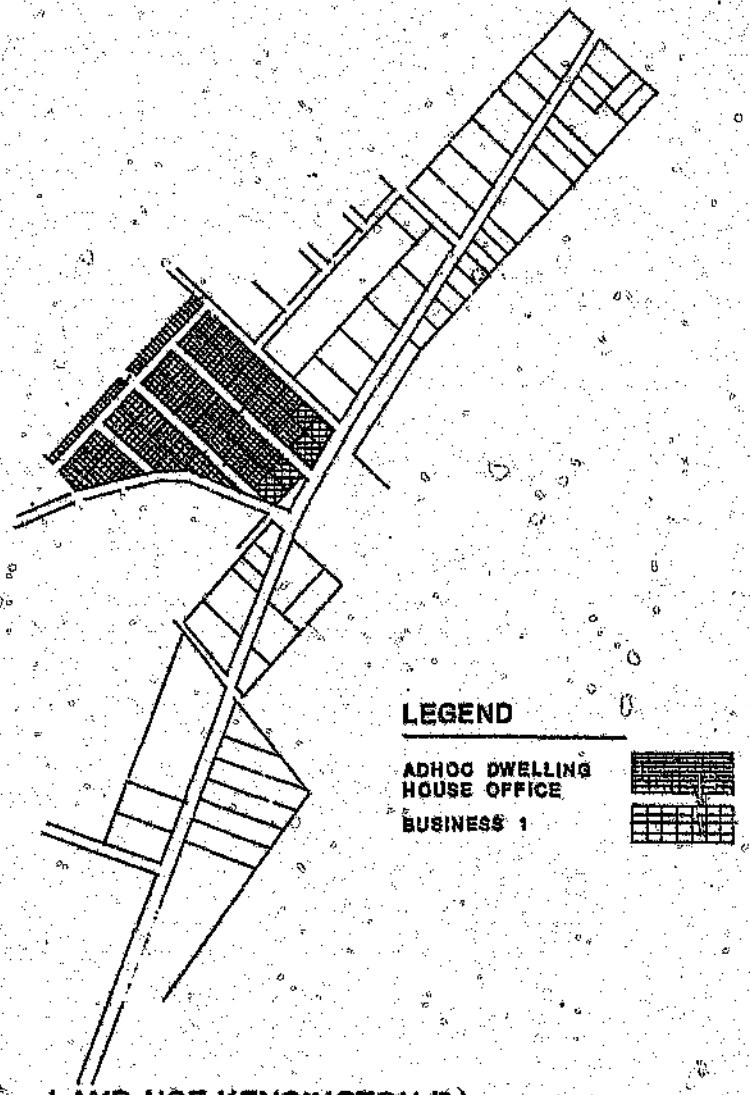
kensington 'B' randburg



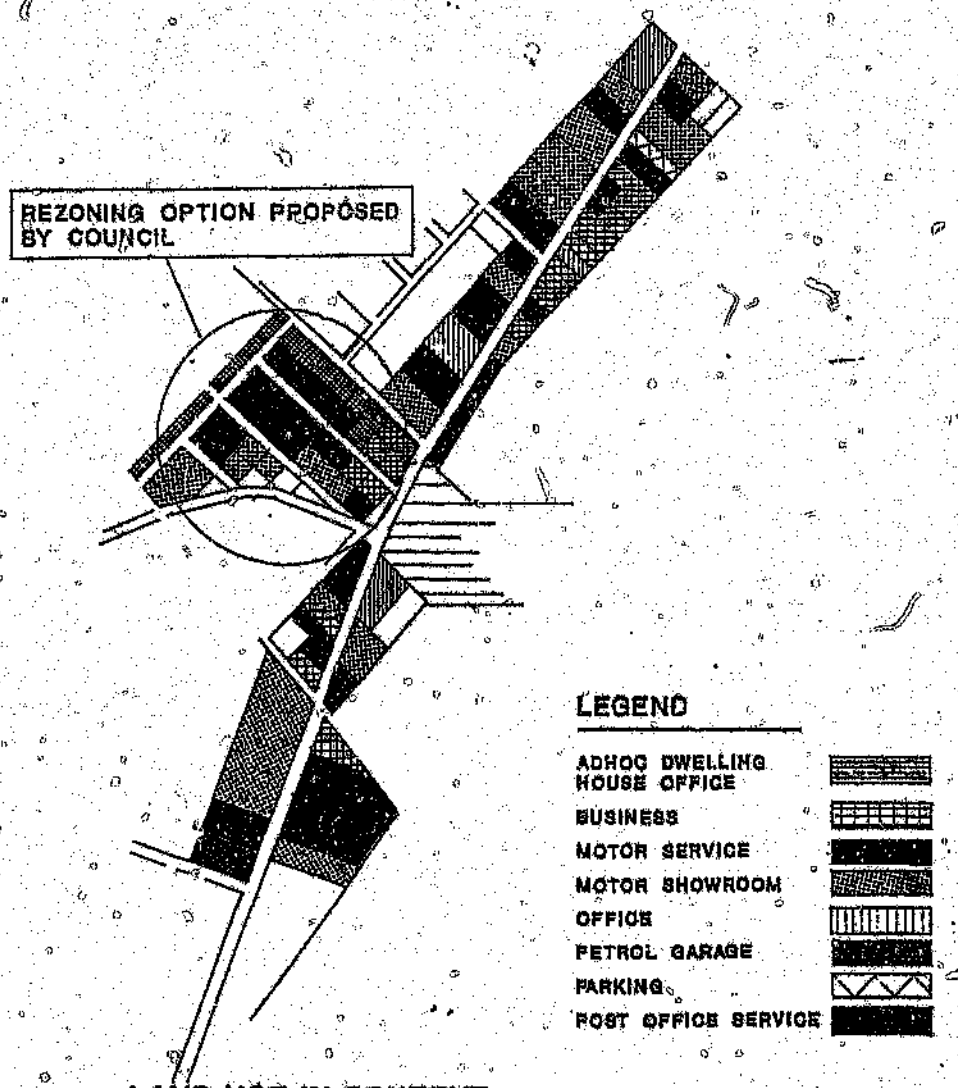
LOCALITY PLAN

FOOTPRINT STUDY - 1980

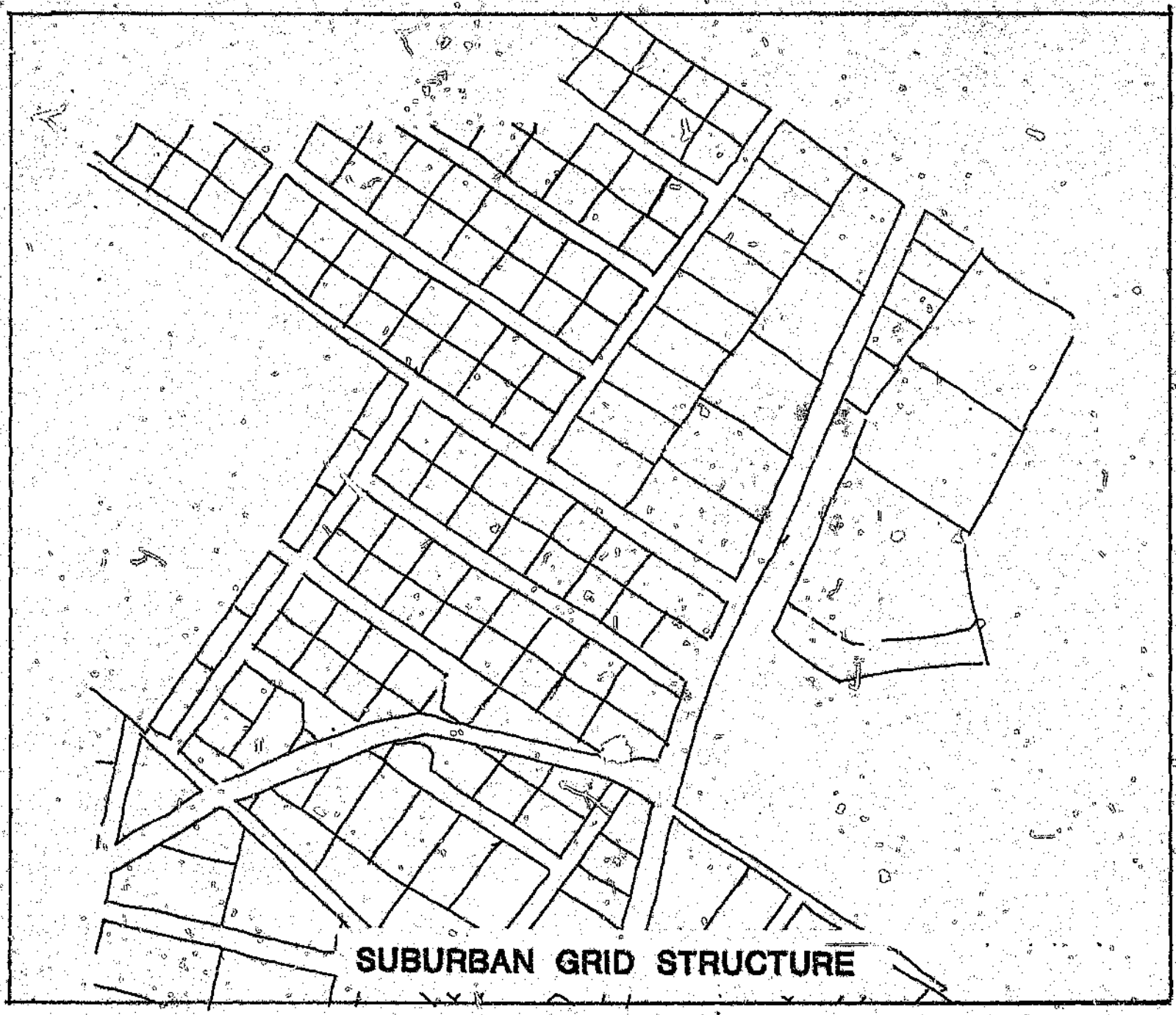
FOOTPRINT STUDY - 1990

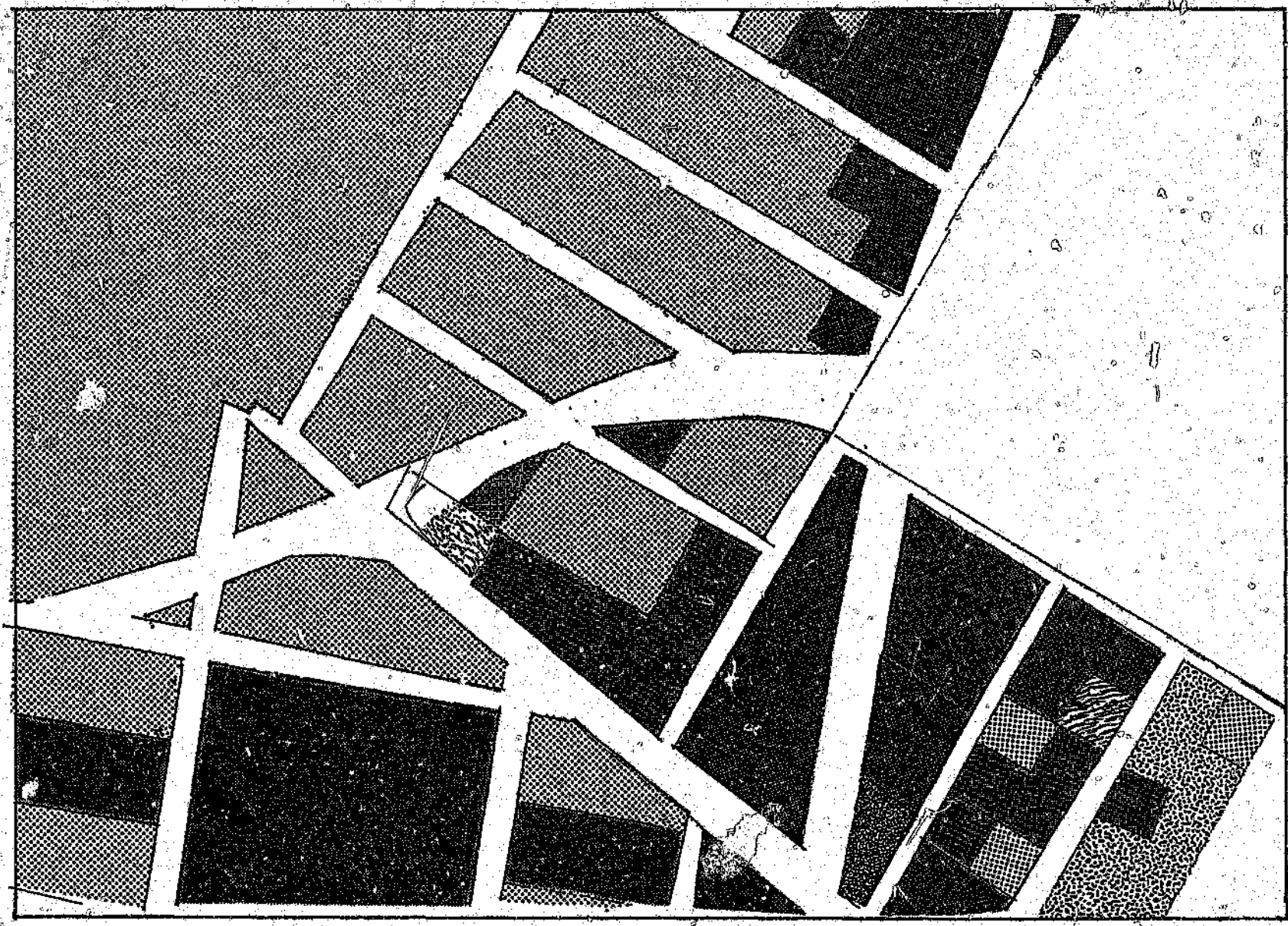


LAND USE KENSINGTON 'B'



LAND USE IN CONTEXT


SUBURBAN GRID STRUCTURE



EXISTING LANDUSE STUDY

KENSINGTON 'B' BANDBURG

TRAFFIC FLOW PROJECTIONS AND INFRASTRUCTURE REQUIREMENTS

	MOTOR	RETAIL SIZE sq.m		MOTOR	RETAIL SIZE sq.m		MOTOR	RETAIL SIZE sq.m	
		100	5700		100	6500		100	3450
P.P.D/DAY		6	342		8	520		8	276
P.P.D/MONTH			6840			10400			5520
V.P.D/DAY		50	2850		50	3250		50	1725
V.P.D/MONTH			57000			65000			34500
SV.P.DAY		1	24		3	72		3	72
SV.P.MONTH			480			1440			1440
BAY AREA	24			24			24		
	prk area	/100	no of bay area	prk area	/100	no of bay area	prk ar	/100	no of bay area
office	144	2	6 300	144	2	6 300	0	3	0 0
retail	2592	6	108 1800	2160	6	90 1500	2160	6	90 1500
showrm	1584	2	66 3300	2112	2	88 4400	93%	2	39 1950
other	288	4	12 300	288	4	12 300	0	4	0 0
prkg bay tot	4608	166	192	4704	188	196	3096	68	129
internal	635	0.2	26	186	0.1	8	1609	0.63	67
area site	40%	7223	4334	40%	8214	4928	60%	4250	1700
bldg area	1871		2889	2126		3286	1962		2550
FAR	0.79	0.26	0.9	0.79	0.26	0.8	0.81	0.46	1.2
landscaping	5%		361	5%		411	5%		213
height	2.0	0.6	2.2	2.0	0.6	2.0	1.4	0.8	2.0
covered p		-0.88	-3829		-0.89	-4374		-0.88	-1488
open p	55%	166	3973	55%	188	4318	35%	62	1488
street p									
private transport									
PERSONS		55%	188.1	65%	338		165.00%	5.2	
V.PERSONS		100%	2850	85%	2763		######	50	
public transport									
BUS		10%	68.4	15%	78		15.00%	1.2	
MICRO BUS		5%	17.1	5%	26		5.00%	0.4	
TRAIN		10%	34.2	10%	52		10.00%	0.8	
PEDESTRIAN		10%	34.2	5%	26		5.00%	0.4	
		1		1			1		
private transport									
CARS/PERSONS		0.70	132	0.70	237		0.70	4	
CARS/V.PERSONS		1.00	2850	1.00	2763		1.00	50	
ROAD 1									
ACCESS/EGRESS									
EXIST FLOWS			19567			19567			19567
NEW FLOWS			22549			22566			19621
ROAD 2									
EXIST FLOWS			12056			12056			12056
NEW FLOWS		65%	14040	50%	13674		50%	12085	

KENSINGTON 'B' RANDBURG

TRAFFIC FLOW PROJECTIONS AND INFRASTRUCTURE REQUIREMENTS

	MOTOR	RETAIL SIZE sq.m		MOTOR	RETAIL SIZE sq.m		MOTOR	RETAIL SIZE sq.m	
		100	5700		100	6500		100	3450
P.P.D/DAY		6	342		8	520		8	276
P.P.D/MONTH			6840			10400			5520
V.P.D/DAY		50	2850		50	3250		50	1725
V.P.D/MONTH			57000			65000			34500
SV.P.DAY		1	24		3	72		3	72
SV.P.MONTH			480			1440			1440
BAY AREA	24			24			24		
	prk area	/100	no of bay area	prk area	/100	no of bay area	prk ar	/100	no of bay area
office	144	2	6 300	144	2	6 300	0	3	0 0
retail	2592	6	108 1800	2160	6	90 1500	2160	6	90 1500
showrm	1584	2	66 3300	2112	2	88 4400	936	2	39 1950
other	288	4	12 300	288	4	12 300	0	4	0 0
prkg bay tot	4608	166	192	4704	188	196	3096	62	129
internal	635	0.2	86	186	0.1	8	1609	0.63	67
area site	40%	7223	4334	40%	8214	4928	60%	4250	1700
bldg area	1871		2889	2126		3286	1962		2550
FAR	0.79	0.26	0.9	0.79	0.26	0.8	0.81	0.46	1.2
landscaping	5%		361	5%		411	5%		213
height	2.0	0.6	2.2	2.0	0.6	2.0	1.4	0.8	3.0
covered p		-0.88	-3829		-0.99	-4374		-0.88	-1488
open p	55%	166	3973	55%	188	4518	35%	62	1488
street p									
private transport									
PERSONS		55%	188.1	65%	338		65.00%	5.2	
V.PERSONS		100%	2850	85%	2763		######	50	
public transport									
BUS		20%	68.4	15%	78		15.00%	1.2	
MICRO BUS		5%	17.1	5%	26		5.00%	0.4	
TRAIN		10%	34.2	10%	52		10.00%	0.8	
PEDESTRIAN		10%	34.2	5%	26		5.00%	0.4	
		1		1			1		
private transport									
CARS/PERSONS		0.70	132	0.70	237		0.70	4	
CARS/V.PERSONS		1.00	2850	1.00	2763		1.00	50	
ROAD 1									
ACCESS/EGRESS									
EXIST FLOWS			19567			19567			19567
NEW FLOWS			22549			22566			19621
ROAD 2									
EXIST FLOWS			12056			12056			12056
NEW FLOWS		65%	14040	50%	13674		50%	12085	

ROAD 3								
EXIST FLOWS		2345		2345			2345	
NEW FLOWS	25%	3189		25% 3278			25% 2961	
KENSINGTON 'B' RANDBURG								
ROAD 4								
EXIST FLOWS		5783		5783			5783	
NEW FLOWS	25%	6827		25% 6710			25% 5799	
	ERR							

KENSINGTON 'B' RANDBURG

FEASIBILITY REPORT

P A R A M E T E R S

ZONING	AREA	SITE AREA	DENSITY	DENSITY	BULK	COVERAGE	COVERAGE	COVERAGE	BUILDING	RESTRICTED	PARKING	PARKING
	erf no	sq.m	(F.A.R)	(F.A.R)	sq.m	sq.m	%	%	LINES	ZONE	bays/100sq.m	REQUIRED
			policy	actual			policy	actual			0.50	
MOTOR TRADE	KENSINGTON	4250	0.6	1.2	5059	2550	40%	60.00%		1.5	129	104
MOTOR TRADE	KENSINGTON	7223	0.6	0.8	5700	2889	40%	40.00%		2.0	166	171
MOTOR TRADE	KENSINGTON	8214	0.6	0.7	6000	3286	40%	40.00%		1.8	188	120
MOTOR TRADE	KENSINGTON	8214	0.6	0.8	6500	3389	40%	41.26%		2.0	192	124

E X P E N D I T U R E

COSTS/SQ.M in RANDS	BLDG COST in RANDS	INFRASTRUC COSTS	LAND COST	CONSRT TIME	ESCALATION ON COMPLETION	CONSTR COST	CONTINGENC	FINANCIAL CHARGES	PROFESSION FEES	FEES IN RANDS	TOTAL EXPENDITURE
					1.0%			15.00%			
		20.00			1.0%		5.0%	15.00%			
	950	4806050.00	108420.00	2000000.00	6	288363.00	5462974.65	260141.65	1119446.20	9.0%	491667.72	9074088.57
	950	5415000.00	286100.00	3000000.00	7	379050.00	6384157.50	304007.50	1407623.63	9.0%	574574.17	11366353.30
	950	5700000.00	324060.00	3400000.00	8	456000.00	6804063.00	324003.00	1530609.45	9.0%	612365.67	12347038.12
	950	6175000.00	313980.00	3400000.00	8	494000.00	7332129.00	349149.00	1609819.35	9.0%	659891.61	13301839.96

I N C O M E

LETTABLE OTHER SPACE	LETTABLE RATIOS	COVER PARKING sq.m area	OPEN PAR no of ba	RESIDUAL AREA	RETAIL	OFFICE	INDUSTRIAL	WAREHOUSE	RETAIL/OFFI MIX	COVERED PARKING	OPEN PARKING

	64.79%	31.78%	24	62	3.43%	30.00	0.00	28.00	0.00	1.00	120.00	60.00
9.50												
	95.00%	0.00%	24	166	5.00%	30.00	21.00	28.00	15.00	1.00	0.00	60.00
9.50												
	95.00%	0.00%	24	188	5.00%	30.00	21.00	28.00	15.00		0.00	60.00
9.50												
	95.00%	0.00%	24	182	5.00%	30.00	21.00	28.00	15.00		0.00	60.00
9.50												

				76.88							
3450.00	3277.50	1608	1488.00	173.50	513000.00	0.00	622440.00	0.00	918000.00	96480.00	44640.00
19779.00											
5700.00	5415.00	0	3984.00	285.00	547200.00	71820.00	1117200.00	31300.00	1676592.00	0.00	119520.00
32490.00											
6000.00	5700.00	0	4512.00	300.00	752400.00	71820.00	925680.00	102600.00	1182960.00	0.00	135360.00
34200.00											
6500.00	6175.00	0	4368.00	325.00	513000.00	71820.00	1308720.00	102600.00	1928112.00	0.00	131040.00
37050.00											

R E T U R N S

CAPITALIZATI	RESIDUAL LA	RESIDUAL LAND PRICE	
RATE	VALUE	VALUE(R/SQ.M)	
11.70%			
13.50%			
12.84%			
13.20%			

11079820.51	2005731.95	471.94	2005731.95
14366888.89	3000533.59	415.41	3000533.59
15748130.84	3401092.72	414.06	3401092.72
16395681.82	3393841.86	413.18	3393841.86

KENSINGTON B RANDBURG

traffic & infra PUBLIC PARKING	PERFORMANCE					as is home offce	comm/ retail	moto town	offices	
	1	2	3	4	5	1	2	3	4	5
is there a demand for pblc parking in this dvlpmt type	E	C	A	B	B	69	67	65	66	66
is there relevance for pblc parking in this dvlpmt type	E	C	A	B	B	69	67	65	66	66
is it suitable for pblc parking in this dvlpmt type	E	C	B	C	C	69	67	66	67	67
is it feasible for public parking in this dvlpmt type	E	D	B	C	C	69	68	66	67	67
does the dvlpmt type contrib to the need for public prkng	E	C	A	B	B	69	67	65	66	66
TOTAL	1	2	3	4	5	69	67	65	66	66

traffic & infra PRIVATE PARKING	PERFORMANCE					retai dvlp	retail comm	home dvlp	ptrol offce	garge
	1	2	3	4	5	1	2	3	4	5
is there a demand for priv parking in this dvlpmt type	E	C	C	C	B	69	67	67	67	66
is there relevance for priv parking in this dvlpmt type	E	C	B	C	B	69	67	68	67	66
is it suitable for private parking in this dvlpmt type	E	D	C	C	C	69	68	67	67	67
is it feasible for private parking in this dvlpmt type	E	D	C	C	C	69	68	67	67	67
does the dvlpmt type contrib to the need for priv prkng	E	C	D	C	B	69	67	68	67	66
TOTAL	1	2	3	4	5	69	67	67	67	66

traffic & infra No of PARKING BAYS over fifty bays	PERFORMANCE					retai dvlp	retail comm	home dvlp	ptrol offce	garge
	1	2	3	4	5	1	2	3	4	5
is there a demand for p bays in this development type	D	D	B	C	B	68	68	66	67	66
is there relevance for p bay in this development type	D	D	B	C	B	68	68	66	67	66
is it suitable for p bays in this development type	D	D	B	D	B	68	68	66	67	66
is it feasible for p bays in this development type	E	D	C	D	B	69	68	67	68	68

does the dvlpmt type contrib to the need for prkng bays	E	D	A	C	B		69	68	65	67	66
TOTAL	1	2	3	4	5		68	68	66	67	66

traffic & infra ACCESS/EGRESS-SITE	PERFORMANCE					retai dvlp 1	retailcomm dvlp 2	home dvlp 3	office 4	petrol garage 5
	1	2	3	4	5					
is there a demand for major ake in this dvlpmnt type	D	D	B	C	B	68	68	66	67	67
is there relevance for major ake in this dvlpmnt type	D	D	B	C	C	68	68	66	67	67
is it suitable for major ake in this dvlpmnt type	D	D	B	D	C	68	68	66	68	67
is it feasible for major ake in this dvlpmnt type	D	D	D	C	C	68	68	66	67	67
does it contribute to major ake in this dvlpmnt type	D	D	B	C	C	68	68	66	67	67
TOTAL	1	2	3	4	5	68	68	66	67	67

traffic & infra PEDESTRIAN ACTIVITY	PERFORMANCE					retai dvlp 1	retailcomm dvlp 2	home dvlp 3	office 4	petrol garage 5
	1	2	3	4	5					
is there a demand for ped ac in this development type	C	B	D	C	B	67	66	68	67	66
is there relevance for ped a in this development type	D	C	D	C	B	68	67	68	67	66
is it suitable for ped actv in this development type	C	C	C	C	C	67	67	67	67	67
is it feasible for ped actv in this development type	D	D	D	D	D	68	68	68	68	68
does the dvlpmnt type contri to pedes activity	B	D	D	C	B	66	66	68	67	66
TOTAL	1	2	3	4	5	67	67	68	67	67

traffic & infra TRAFFIC CIRCULATION	PERFORMANCE					retai dvlp 1	retailcomm dvlp 2	home dvlp 3	office 4	petrol garage 5
	1	2	3	4	5					
is there a demand for traff circ in this dvlpmnt t	E	D	A	B	C	69	68	65	66	67
is there relevance for traff circ in this dvlpmnt t	D	D	A	B	D	68	68	65	66	68

KENSINGTON B RANDBURG

is it suitable for traff circ in this dvlpmnt t	ID	1D	1B	1B	1B	68	68	66	66	66
is it feasible for traff circ in this dvlpmnt t	1E	1D	1A	1B	1B	69	68	65	66	66
does the dvlpmnt type contri to traff circulation	1E	1D	1A	1B	1B	69	68	65	66	66
TOTAL	11	12	13	14	15	69	68	65	66	67

traffic & infra FUTURE DEMAND	P E R F O R M A N C E					retai dvlp 1	retailcomm dvlp 2	home dvlp 3	office 4	petrol garge 5
	11	12	13	14	15					
is there a futu and in this develop type	1E	1C	1B	1B	1B	69	67	66	66	66
is future demand relevant in this development type	1E	1D	1B	1B	1B	69	68	66	66	66
is it suitable for f demand in this development type	1E	1C	1A	1C	1C	69	67	65	67	67
is it feasible for future de in this development type	1E	1D	1C	1D	1D	69	68	67	68	68
does it contribute to f dema in this development type	1D	1C	1B	1C	1C	68	67	66	67	67
TOTAL	11	12	13	14	15	69	67	66	67	67

traffic & infra DEVELOPMENT POPULATION	P E R F O R M A N C E					retai dvlp 1	retailcomm dvlp 2	home dvlp 3	office 4	petrol garge 5
	11	12	13	14	15					
is there a demand for a major devop pop in this dvlp	1E	1D	1D	1C	1B	69	68	68	67	66
is there relevance for a major devop pop in this dvlp	1E	1D	1D	1C	1B	69	68	68	67	66
is it suitable for a major devop pop in this dvlp	1D	1C	1C	1C	1B	68	67	67	67	66
is it feasible for major devop pop in this dvlp	1D	1C	1C	1C	1B	68	67	67	67	66
does it contribute to a major development population	1E	1D	1C	1C	1B	69	68	67	67	66
TOTAL	11	12	13	14	15	69	68	67	67	66

traffic & infra VISITORS TO DEVELOPMENT	PERFORMANCE 1	2	3	4	5	retai dvlp 1	retailcomm 2	home dvlp 3	ptrol offce 4	garge 5
KENSINGTON B RANDBURG										
is there a demand for visito in this development type	E	C	A	B	B	69	67	65	66	66
is there relevance for visit in this development type	D	C	A	A	B	68	67	65	65	66
is it suitable for visitors in this development type	D	D	B	D	D	68	68	66	68	68
is it feasible for visitors in this development type	E	D	B	D	D	69	68	66	68	68
does it contribute to visito in this development type	E	D	A	D	C	69	68	65	67	67
TOTAL	1	2	3	4	5	69	68	65	67	67

traffic & infra SERVICE VEHICLES	PERFORMANCE 1	2	3	4	5	retai dvlp 1	retailcomm 2	home dvlp 3	ptrol offce 4	garge 5
is there a demand for ser vehicles in this dvlpmnt	E	D	B	B	C	69	68	66	66	67
is there relevance for ser vehicles in this dvlpmnt	E	D	B	B	C	69	68	66	66	67
is it suitable for ser vehicles in this dvlpmnt	D	B	A	B	C	68	66	65	66	67
is it feasible for ser vehicles in this dvlpmnt	D	C	B	C	C	68	67	66	67	67
does it contribute to ser vehicles in this dvlpmnt	E	D	A	C	D	69	68	65	67	68
TOTAL	1	2	3	4	5	69	67	66	66	67

traffic & infra SERVICES	PERFORMANCE 1	2	3	4	5	retai dvlp 1	retailcomm 2	home dvlp 3	ptrol offce 4	garge 5
is there a demand for serv in this development type	E	D	A	C	B	69	68	65	67	66
is there relevance for serv	D	C	B	C	C	68	67	66	67	67

in this development type																					
is it suitable for services in this development type	D	D	B	C	C		69	68	66	67	67										
is it feasible for services in this development type	D	D	B	C	C		68	68	66	67	67										
does it contribute to need for services in this dvlpmt typ	D	C	B	C	C		68	67	66	67	67										
TOTAL	1	2	3	4	5		68	68	66	67	67										

KENSINGTON & HANDBOOK

traffic & infra EXISTING INFRASTRUCTURE	P E R F O R M A N C E					retai dvlp	retail comm	home dvlp	ptrol offce	garge
	1	2	3	4	5	1	2	3	4	5
is there a demand on exist infr in this dvlpmnt t	D	C	A	B	B	68	67	65	66	66
is there relevance for exist infr in this dvlpmnt t	D	C	A	B	B	68	67	65	66	66
is it suitable for exist infr in this dvlpmnt t	D	D	B	C	C	68	68	66	67	67
is it feasible for exist infr in this dvlpmnt t	D	C	A	C	B	68	67	65	67	66
does exist infra contribute adequately for this dvlpmnt	D	C	B	C	B	68	67	66	67	66
TOTAL	1	2	3	4	5	68	67	65	67	66

KENSINGTON B RANDBURG

ANALYSIS MATRIX

TRAFFIC & INFRASTRUCTURE

	1	2	3	4	5	6	7	8	9	10
PUBLIC PARKING	69	67	65	66	66	0	0	0	0	0
PRIVATE PARKING	69	67	67	67	66	0	0	0	0	0
No of PARKING BAYS	68	68	66	67	66	0	0	0	0	0
ACCESS/EGRESS-SITE	68	68	66	67	67	0	0	0	0	0
PEDESTRIAN ACTIVITY	67	67	68	67	67	0	0	0	0	0
TRAFFIC CIRCULATION	69	68	65	66	67	0	0	0	0	0
FUTURE DEMAND	69	67	65	67	67	0	0	0	0	0
DEVELOPMENT POPULATION	69	68	67	67	66	0	0	0	0	0
VISITORS TO DEVELOPMEN	69	68	65	67	67	0	0	0	0	0
SERVICE VEHICLES	69	67	66	66	67	0	0	0	0	0
SERVICES	68	68	66	67	67	0	0	0	0	0
EXISTING INFRASTRUCTUR	68	67	65	67	66	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	821	810	793	802	799	0	0	0	0	0

urban design S C A L E	P E R F O R M A N C E	as is	res	comm/ comm	retai	auto town	offi
	1 2 3 4 5		1	2	3	4	5
does this devlpmnt type arrant the concept of scale	E E B C B		69	69	66	67	66
is scale relevant to this development type	E E A D B		69	69	65	68	66
is scale suitable for this development type	E E A D B		69	69	65	68	66
is it feasible for scale in this development type	E E C D D		69	69	67	68	68
does this develpmnt type contribute to scale	E E B C B		69	69	66	67	68
TOTAL	1 2 3 4 5		69	69	66	68	66

urban design S E N S I T I V I T Y	P E R F O R M A N C E	as is	res	comm/ comm	retai	auto town	offi
	1 2 3 4 5		1	2	3	4	5
is there a demand for sensitivity in this dvlpmnt	E D B B B		69	68	66	66	66
is there relevance for sensitivity in this dvlpmnt	E D A B B		69	68	65	66	66
is it suitable for sensitivity in this dvlpmnt	E D B B B		69	68	66	66	66
is it feasible for sensitivity in this dvlpmnt	E E B C C		69	69	66	67	67
does this develpmnt type contribute to sensitivity	E D B B B		69	68	66	66	66
TOTAL	1 2 3 4 5		69	68	66	66	66

urban design I N T E R G R A T I O N	P E R F O R M A N C E	as is	res	comm/ comm	retai	auto town	offi
	1 2 3 4 5		1	2	3	4	5
is there a demand for interg in this development type	D D A B B		68	68	65	66	66
is there relevance for inter in this development type	D D A B B		68	68	65	66	66
is it suitable for intergrat in this development type	D D A C C		68	68	65	67	67

is it feasible to intergrate in this development type	E	E	B	B	C	69	69	66	66	67
does it contribute to interg in this development type	D	D	A	B	B	68	68	65	66	66
TOTAL	1	2	3	4	5	68	68	65	66	66

urban design DESIRABILITY	PERFORMANCE 1	2	3	4	5	as is 1 res comm	2 comm retai	3 town	4	5
is there a demand for desirability in this dvlpmnt	D	D	D	B	D	68	68	68	66	68
is there relevance for this dvlpmnt type to be desirable	D	D	D	B	D	68	68	68	66	68
is it suitable for this dvlpmnt type to be desirable	D	D	D	B	D	68	68	68	66	68
is it feasible for this dvlpmnt type to be desirable	D	D	D	C	D	68	68	68	67	68
does this dvlpmnt type contribute to desirability	D	D	D	A	C	68	68	68	65	67
TOTAL	1	2	3	4	5	68	68	68	66	68

urban design IDENTITY	PERFORMANCE 1	2	3	4	5	as is 1 res comm	2 comm retai	3 town	4	5
does this dvlpmnt type demand identity	C	C	E	C	D	67	67	69	67	68
is it relevant for this dvlpmnt type to have identit	C	C	E	C	D	67	67	69	67	68
is it suitable for this dvlpmnt type to have identit	D	D	D	D	D	68	68	68	68	68
is it feasible for this dvlpmnt type to have identity	D	D	D	D	D	68	68	68	68	68
does this dvlpmnt type contribute to identity	D	C	D	B	C	68	67	68	66	67
TOTAL	1	2	3	4	5	68	67	68	67	68

urban design	PERFORMANCE	as is res comm/

CHARACTER						as is	res	comm/ retai	mixd town	offi
	I1	I2	I3	I4	I5	1	2	3	4	5
is there a demand for character in this dvlpmnt ty	ID	ID	IC	IB	IB	68	68	67	66	66
is it relevant for this dvlpmnt type to have charact	ID	ID	IC	IB	IB	68	68	67	66	66
is it suitable for this dvlpmnt type to have charact	IE	ID	IC	IB	IB	69	68	67	66	66
is it feasible for this dvlp type to have character	IE	IE	IC	IC	IC	69	69	67	67	67
does this dvlpmnt type contribute to character	IE	ID	IC	IC	IB	69	68	67	67	66
TOTAL	I1	I2	I3	I4	I5	69	68	67		

urban design VIEW FROM THE ROAD	P E R F O R M A N C E					as is	res	comm/ retai	mixd town	offi
	I1	I2	I3	I4	I5	1	2	3	4	5
is there a demand for this dvlpmnt to be viewed from th	IB	ID	IE	ID	ID	66	68	69	68	68
is there relevance for this dvlpmnt to be viewed from th	IC	ID	IE	ID	IC	67	68	69	68	67
is it suitable for this dvlpmnt to be viewed from th	IC	ID	ID	IB	IB	67	68	68	66	66
is it feasible for this dvlpmnt to be viewed from th	ID	ID	ID	ID	ID	68	68	68	68	68
does it contribute to the view from the road	IB	IB	ID	ID	IC	66	66	68	68	67
TOTAL	I1	I2	I3	I4	I5	67	68	68	68	67

urban design VISUAL INTEREST	P E R F O R M A N C E					as is	res	comm/ retai	mixd town	offi
	I1	I2	I3	I4	I5	1	2	3	4	5
does this dvlpmnt type demand visual interest	IC	IC	ID	IB	ID	67	67	68	66	68
is visual interest relevant to this dvlpmnt type	IC	IC	ID	IC	ID	67	67	68	67	68
is this dvlpmnt type suitabl	IC	IC	IC	IC	IC	67	67	67	67	67

for visual interest					
is it feasible for this devl to be of visual interest	D	D	B	D	D
does this dvlpmt type contribute to visual interes	B	C	D	B	C
TOTAL	1	2	3	4	5

	68	68	68	68	68
	66	67	68	66	67
	67	67	68	67	68

urban design AMENITY/ COMFORT	P E R F O R M A N C E				
	1	2	3	4	5

as is	res comm	comm/ retai	upto town	offi
1	2	3	4	5

is there a demand for such amenity and comfort	E	E	B	E	B
is there relevance for such amenity and comfort	C	E	A	E	B
is it suitable for this dvlp type to provide amenity/comf	C	C	C	D	A
is it feasible for this dvlp type to provide amenity/comf	C	C	B	C	B
does this dvlpmt contribute to amenity and comfort	C	B	C	D	
TOTAL	1	2	3	4	5

	67	69	66	69	66
	67	69	65	69	66
	67	67	67	68	63
	67	67	66	67	66
	67	66	67	66	66
	67	68	66	68	66

urban design ARCHITECTURAL RESPONSE	P E R F O R M A N C E				
	1	2	3	4	5

as is	res comm	comm/ retai	upto town	offi
1	2	3	4	5

does the type of dvlpmnt demand an architectural resp	D	D	C	B	D
is an architectural response relevant to this dvlpmnt typ	C	D	D	B	D
is a suitable arch response possible in this dvlpmnt typ	D	D	D	D	D
is an architectural response feasible for this dvlpmnt ty	D	D	D	D	D
does this dvlpmnt contribute to an architectural response	C	C	C	B	D
TOTAL	1	2	3	4	5

	68	68	67	66	68
	67	68	68	66	68
	68	68	68	68	68
	68	68	68	68	68
	67	67	67	66	68
	68	68	68	67	68

urban design CONTROLS	PERFORMANCE					as is	res comm	comm/ retai	moto town	offi
	11	12	13	14	15		1	2	3	4	5
does this devlpmnt type accept the concept of control	ID	ID	IC	IB	IB		68	68	67	66	66
are controls relevant to this development type	ID	ID	ID	ID	ID		68	68	68	68	68
are controls suitable to this development type	ID	ID	ID	ID	ID		68	68	68	68	68
are controls feasible to this development type	ID	IC	IC	IC	IC		68	67	67	67	67
would controls contribute to this development type	IC	IB	ID	ID	ID		67	66	68	68	68
TOTAL	11	12	13	14	15		68	67	68	67	67

urban design ORIENTATION	PERFORMANCE					as is	res comm	comm/ retai	moto town	offi
	11	12	13	14	15		1	2	3	4	5
is there a demand for orientation in this dvlpmnt	ID	ID	ID	ID	ID		69	68	68	68	68
is orientation relevant in this devlpmnt type	ID	IC	IB	IB	IB		68	67	66	66	66
is it suitable for this dvlpmnt type to have orientat	ID	ID	IC	IB	IC		68	68	67	65	67
is it feasible for this dvlpmnt type to have orientat	ID	ID	ID	ID	ID		68	68	68	68	68
does this dvlpmnt type contribute to orientation	IB	IB	IE	IC	IB		66	66	69	67	66
TOTAL	11	12	13	14	15		68	67	68	67	67

urban design LANDSCAPE	PERFORMANCE					as is	res comm	comm/ retai	moto town	offi
	11	12	13	14	15		1	2	3	4	5
is there a demand for landsca in this development type	ID	IC	IA	IA	IC		68 5	67	65	65	67
is landscaping relevant in this development type	IE	ID	IA	IA	IC		69 5	68	65	65	67
is landscaping suitabl	IE	IE	IC	IC	ID		69	69	67	67	68

urban design LANDSCAPE	PERFORMANCE					as is	res comm 1	comm/ retai 2	moto town 3	offi 4	5
	I1	I2	I3	I4	I5						
is there a demand for landsca in this development type	ID	IC	IA	IA	IC		68 5	67	65	65	67
is landscaping relevant in this development type	IE	ID	IA	IA	IC		69 5	68	65	65	67
is landscaping suitable in this development type	IE	IE	IC	IC	ID		69 5	69	67	67	68
is landscaping feasible in this development type	IE	IE	IC	IB	IC		69 50	69	67	66	67
does this dvlpmnt type contribute to landscaping	IE	ID	IA	IA	IC		69 69	68	65	65	67
TOTAL	I1	I2	I3	I4	I5		69	68	66	66	67

urban design ROBUST & FLEXIBILITY	PERFORMANCE					as is	res comm 1	comm/ retai 2	moto town 3	offi 4	5
	I1	I2	I3	I4	I5						
is robustness & flexibility accessable in this devlpmnt	ID	ID	IB	ID	IB		66 5	68	66	68	66
is robustness & flexibility relevant in this devlpmnt ty	ID	ID	IA	IC	IB		68 5	68	65	67	66
is robustness & flexibility suitable in this devlpmnt ty	IC	ID	IA	IC	IB		67 5	68	65	67	66
is robustness & flexibility feasible in this devlpmnt ty	ID	ID	IB	ID	IC		68 50	68	66	68	67
does this devlpmnt type cont towards flexibility & robust	ID	ID	IB	IB	IC		68 68	68	66	66	67
TOTAL	I1	I2	I3	I4	I5		68	68	66	67	66

urban design DISTRICT CONTRIBUTION	PERFORMANCE					as is	res comm 1	comm/ retai 2	moto town 3	offi 4	5
	I1	I2	I3	I4	I5						
is there a demand in the are for this development type	IC	IE	IA	IE	IB		67 5	69	65	69	66
is this dvlpmnt type relevant for the area	IC	IE	IB	IE	IA		67 5	69	66	69	65
is this dvlpmnt type suitable for the area	IC	IE	IA	IE	IA		67 5	69	65	69	65

is robustness & flexibility feasible in this devlpmnt ty	1D	1D	1B	1D	1C	68	68	66	68	67
						50				
does this devlpmnt type cont towards flexibility & robustn	1D	1D	1B	1B	1C	68	68	66	66	67
						68				
TOTAL	11	12	13	14	15	68	68	66	67	66

urban design DISTRICT CONTRIBUTION	P E R F O R M A N S E					as is	res conn	res/ retai	auto town	offi
	11	12	13	14	15	1	2	3	4	5
is there a demand in the are for this development type	1C	1E	1A	1E	1B	67	69	65	69	66
						3				
is this dvlpmnt type relevant for the area	1C	1E	1B	1E	1A	67	69	66	69	65
						5				
is this dvlpmnt type suitable for the area	1C	1E	1A	1E	1A	67	69	65	69	65
						5				
is this dvlpmnt type feasible for the area	1D	1E	1A	1E	1B	68	69	65	69	66
						50				
does this dvlpmnt type contribute to the area	1D	1D	1D	1B	1B	68	68	68	68	66
						67				
TOTAL	11	12	13	14	15	67	69	66	69	66

ANALYSIS MATRIX

DESIGN PRINCIPLES/DEVELOPMENT

	1	2	3	4	5	6	7	8	9	10
SCALE	69	69	66	68	66	0	0	0	0	0
SENSITIVITY	69	68	66	66	66	0	0	0	0	0
INTERPRETATION	68	68	65	66	66	0	0	0	0	0
DESIRABILITY	68	68	68	66	68	0	0	0	0	0
IDENTITY	68	67	68	67	68	0	0	0	0	0
CHARACTER	69	68	67	66	66	0	0	0	0	0
VIEWS FROM THE ROAD	67	68	68	68					0	0
VISUAL INTEREST	67	67	68	67					0	0
AMENITY/COMFORT	67	68	66	66	66	0	0	0	0	0
ARCHITECTURAL RESPONSE	69	68	68	67	66	0	0	0	0	0
CONTROLS	68	67	68	67	67	0	0	0	0	0
ORIENTATION	68	67	68	67	67	0	0	0	0	0
LANDSCAPE	69	68	66	66	67	0	0	0	0	0
ROBUST & FLEXIBILITY	68	68	66	67	66	0	0	0	0	0
DISTRICT CONTRIBUTION	67	69	66	69	66	0	0	0	0	0
	1019	1019	1003	1005	1003	0	0	0	0	0

land use VIABILITY	PERFORMANCE 1	2	3	4	5	as is home offce	comm/ retai	moto town	offces
						1	2	3	4	5
is there a demand for this development type	A	C	B	E	B	65	67	66	69	66
is there relevance for this development type	C	D	B	E	B	67	68	66	69	66
is it suitable for this development type	C	C	B	D	C	67	67	66	68	67
is it feasible for this development type	D	D	D	D	D	68	68	68	68	68
does this development type contribute to viability	E	E	C	C	C	69	69	67	67	67
TOTAL	F	E	3	4	5	67	68	67	68	67

land use FEASIBILITY	PERFORMANCE 1	2	3	4	5	as is comm	res retai	comm/ town	moto	offi
						1	2	3	4	5
is there a demand for this development type	D	D	B	D	B	68	68	66	68	66
is there relevance for this development type	C	C	B	D	A	67	67	66	68	65
is it suitable for this development type	E	E	A	D	C	69	69	65	68	67
is it feasible for this development type	E	E	A	D	B	69	69	65	68	66
does this development type contribute to feasibility	D	D	B	E	B	68	68	66	69	66
TOTAL	1	2	3	4	5	68	68	66	68	66

land use LOCATION	PERFORMANCE 1	2	3	4	5	as is comm	res retai	comm/ town	moto	offi
						1	2	3	4	5
is there a demand for locati in this development type	C	C	C	C	C	67	67	67	67	67
is there relevance for locat in this development type	C	a	e	e	E	67	97	101	101	69
is it a suitable location for this development type	B	C	A	E	A	66	67	65	69	65

is it a feasible location for this development type	1C	2C	3B	4E	5B
consistent with development type	1B	2B	3B	4D	5C
TOTAL	11	12	13	14	15

	as is	res comm	comm/ retail	auto town	offi
	1	2	3	4	5
	66	66	66	68	67
	67	69	67	68	66
	67	69	67	69	65
	66	68	65	68	65
	66	68	66	69	66
	66	68	65	68	66
	66	68	66	68	66

land use
LETABILITY

PERFORMANCE

is there a demand for this development type	1C	2E	3C	4D	5B
is there relevance for this development type	1C	2E	3C	4E	5A
is it suitable for letability for this dvlpmnt	1B	2D	3A	4D	5A
is it feasible for letability for this dvlpmnt	1B	2D	3B	4E	5B
does it contribute to letability for this dvlpmnt	1B	2D	3B	4D	5B
TOTAL	11	12	13	14	15

	as is	res comm	comm/ retail	auto town	offi
	1	2	3	4	5
	67	69	67	68	66
	67	69	67	69	65
	66	68	65	68	65
	66	68	66	69	66
	66	68	65	68	66
	66	68	66	68	66

land use
ACCESS AND CIRCULATION

PERFORMANCE

is a&c a demand for this development type	1E	2D	3A	4A	5B
is a&c relevance for this development type	1C	2C	3C	4C	5C
is a&c suitable for this development type	1E	2E	3C	4D	5D
is a&c feasible for this development type	1E	2E	3B	4C	5C
does a&c contribute to this development type	1C	2D	3C	4D	5C
TOTAL	11	12	13	14	15

	as is	res comm	comm/ retail	auto town	offi
	1	2	3	4	5
	69	68	65	65	66
	67	67	67	67	67
	69	69	67	68	68
	69	69	66	67	67
	67	68	67	68	67
	68	68	66	67	67

land use

PERFORMANCE

as is res comm/ auto offi

FLEXIBILITY	1	2	3	4	5
is there a demand for flexibility in this dvlpmnt	E	D	C	C	C
is there relevance for flexibility in this dvlpmnt	D	D	C	C	C
is it suitable for flexibility in this dvlpmnt	D	D	B	C	B
is it feasible for flexibility in this dvlpmnt	E	D	B	C	B
does it contribute to flexibility in this dvlpmnt	E	D	A	D	B
TOTAL	1	2	3	4	5

as is	comm 1	res 2	comm/ retai 3	mixed town 4	offi 5
is there a demand for flexibility in this dvlpmnt	69	68	67	67	67
is there relevance for flexibility in this dvlpmnt	68	68	67	67	67
is it suitable for flexibility in this dvlpmnt	68	68	66	67	66
is it feasible for flexibility in this dvlpmnt	69	68	66	67	66
does it contribute to flexibility in this dvlpmnt	69	68	65	68	66
TOTAL	69	68	66	67	66

land use PARKING PERFORMANCE	1	2	3	4	5
is there a demand for parking in this development type	E	D	A	B	B
is there relevance for parking in this development type	D	C	A	B	B
is it suitable for parking in this development type	E	D	C	C	C
is it feasible for parking in this development type	E	E	C	D	D
does it contribute to parking in this development type	E	D	A	C	C
TOTAL	1	2	3	4	5

as is	comm 1	res 2	comm/ retai 3	mixed town 4	offi 5
is there a demand for parking in this development type	69	68	65	66	66
is there relevance for parking in this development type	68	67	65	66	66
is it suitable for parking in this development type	69	68	67	67	67
is it feasible for parking in this development type	69	69	67	68	68
does it contribute to parking in this development type	69	68	65	67	67
TOTAL	69	68	66	67	67

land use VISIBILITY PERFORMANCE	1	2	3	4	5
is there a demand for visibility in this dvlpmnt t	B	D	E	C	B
is there relevance for visibility in this dvlpmnt t	C	C	C	C	C
is it suitable for	B	D	C	C	B

as is	comm 1	res 2	comm/ retai 3	mixed town 4	offi 5
is there a demand for visibility in this dvlpmnt t	66	68	69	67	68
is there relevance for visibility in this dvlpmnt t	67	67	67	67	67
is it suitable for	66	68	67	67	66

visibility in this dvlpmnt t					
is it feasible to obtain visibility in this dvlpmnt t	B	D	D	D	C
does it contribute to visibility in this dvlpmnt t	B	C	C	C	C
TOTAL	1	2	3	4	5

	66	68	68	68	67
	66	67	67	67	67
	66	68	68	67	67

land use IMAGEABILITY	PERFORMANCE				
	1	2	3	4	5

as is	res	comm/ retai	mxtd town	offi
1	2	3	4	5

is there a demand for imagea for this development type	B	C	D	A	D
is there relevance for image for this development type	C	C	D	B	D
is it suitable for imageabil for this development type	B	C	B	E	A
is it feasible to obtain ima for this development type	C	D	C	E	B
does it contribute to imagea for this development type	D	D	D	B	C
TOTAL	1	2	3	4	5

	66	67	68	65	68
	67	67	68	66	68
	66	67	66	69	65
	67	68	67	69	66
	68	68	68	66	67
	67	67	67	67	67

land use COMPATIBILITY	PERFORMANCE				
	1	2	3	4	5

as is	res	comm/ retai	mxtd town	offi
1	2	3	4	5

is there a demand for compatibility in this dvlpmn	D	C	A	B	C
is there relevance for compatibility in this dvlpmn	D	D	B	A	C
is it suitable for compatibility in this dvlpmn	E	D	A	B	C
is it feasible for compatibility in this dvlpmn	E	D	B	B	C
does it contribute to compatibility in this dvlpmn	E	E	A	A	B
TOTAL	1	2	3	4	5

	68	67	65	66	67
	68	68	66	65	67
	69	68	65	66	67
	69	68	66	66	67
	69	69	65	65	66
	69	68	65	66	67

Land Use PRESENT POLICY	P E R F O R M A N C E					as is	res comm	res/ retail	mixed town	offi
	11	12	13	14	15	1	2	3	4	5
are there pressures on p. pol for this development type	15	15	10	10	15	66	69	65	68	65
is there relevance in p. pol for this development type	15	15	10	10	10	69	69	66	69	65
is it suitable for p. policy to fuel this development type	10	10	10	10	10	65	68	66	69	65
is it feasible for p. policy to accept this development	15	15	10	15	15	69	69	66	69	66
does this development type contribute to present policy	10	15	10	10	10	69	69	65	66	65
TOTAL	60	65	50	55	60	68	67	65	68	65

KENSINGTON 'B' BANDBURG

ANALYSIS MATRIX — L A N D U S E

	1	2	3	4	5	6	7	8	9	10
VIABILITY	67	68	67	68	67	0	0	0	0	0
FEASIBILITY	68	68	66	68	66	0	0	0	0	0
LOCATION	67	73	73	75	67	0	0	0	0	0
LETABILITY	66	68	66	68	66	0	0	0	0	0
ACCESS AND CIRCULATION	68	68	66	67	67	0	0	0	0	0
FLEXIBILITY	69	68	66	67	66	0	0	0	0	0
PARKING	69	68	66	67	67	0	0	0	0	0
VISIBILITY	66	68	68	67	67	0	0	0	0	0
IMAGEABILITY	67	67	67	67	67	0	0	0	0	0
COMPATIBILITY	69	68	65	66	67	0	0	0	0	0
PRESENT POLICY	68	69	65	68	65	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
	743	753	735	748	731	0	0	0	0	0

KENSINGTON 'B' RANDBURG

TRAFFIC FLOW PROJECTIONS AND INFRASTRUCTURE REQUIREMENTS

	MOTOR	RETAIL SIZE sq.m		MOTOR	RETAIL SIZE sq.m		MOTOR	RETAIL SIZE sq.m	
		100	5700		100	6500		100	3450
P.P.D/DAY		6	342		8	520		8	276
P.P.D/MONTH			6840			10400			5520
V.P.D/DAY		50	2850		50	3250		50	1725
V.P.D/MONTH			57000			65000			34500
SV.P.DAY		1	24		3	72		3	72
SV.P.MONTH			480			1440			1440
BAY AREA	24			24			24		
	prk area	/100	no of bay area	prk area	/100	no of bay area	prk ar	/100	no of bay area
office	144	2	6 300	144	2	6 300	0	3	0 0
retail	2592	6	108 1800	2160	6	90 1500	2160	6	90 1500
showrm	1584	2	66 3300	2112	2	88 4400	936	2	39 1950
other	288	4	12 300	288	4	12 300	0	4	0 0
prkg bay tot	4608	— 166	192	4704	188	196	3096	62	129
internal	635	0.2	26	186	0.1	8	1609	0.63	67
area site	40%	7223	4334	40%	8214	4928	60%	4250	1700
bldg area	1871		2889	2126		3286	1962		2550
FAR	0.79	0.26	0.9	0.79	0.26	0.1	0.81	0.46	1.2
landscaping	5%		361	5%		411	5%		213
height	2.0	0.6	2.2	2.0	0.6	2.0	1.4	0.8	2.0
covered p		-0.88	-3829		-0.89	-4374		-0.88	-1488
open p	55%	166	3973	55%	188	4518	35%	62	1488
street p									
private transport									
PERSONS		55%	188.1	65%	338		65.00%	5.2	
V.PERSONS		100%	2850	85%	2763		######	50	
public transport									
BUS		20%	68.4	15%	78		15.00%	1.2	
MICRO BUS		5%	17.1	5%	26		5.00%	0.4	
TRAIN		10%	34.2	10%	52		10.00%	0.8	
PEDESTRIAN		10%	34.2	5%	26		5.00%	0.4	
		1		1			1		
private transport									
CARS/PERSONS		0.70	132	0.70	237		0.70	4	
CARS/V.PERSONS		1.00	2850	1.00	2763		1.00	50	
ROAD 1									
ACCESS/EGRESS									
EXIST FLOWS			19567			19567			19567
NEW FLOWS			22547			28566			19621
ROAD 2									
EXIST FLOWS			12056			12056			12056
NEW FLOWS		65%	14040	50%	13674		50%	12085	

ROAD 3								
EXIST FLOWS		2345			2345			2345
NEW FLOWS	25%	3189		25%	3272		25%	2361

KENSINGTON 'B' RANDBORG

ROAD 4								
EXIST FLOWS		5783			5783			5783
NEW FLOWS	25%	6627		25%	6710		25%	5799
	EAR							

KENSINGTON 'B' RANDBURG

FEASIBILITY REPORT

P A R A M E T E R S

ZONING	AREA erf no	SITE AREA sq.m	DENSITY (F.A.R) policy	DENSITY (F.A.R) actual	BULK sq.m	COVERAGE sq.m	COVERAGE % policy	COVERAGE % actual	BUILDING LINES	RESTRICTED ZONE	PARKING bays/100sq.m	PARKING REQUIRED
											0.50	
MOTOR TRADE KENSINGTON		4250	0.6	1.2	5059	2550	60%	60.00%		1.5	129	101
MOTOR TRADE KENSINGTON		7223	0.6	0.8	5700	2889	40%	40.00%		2.0	166	171
MOTOR TRADE KENSINGTON		8214	0.6	0.7	6000	3286	40%	40.00%		1.8	188	120
MOTOR TRADE KENSINGTON		8214	0.6	0.8	6500	3387	40%	41.24%		2.0	182	124

E X P E N D I T U R E

COSTS/SQ.M in RANDS	BLDG COST in %	INFRASTRUC COSTS	LAND COST TIME	CONSRT ESCALATION ON COMPLETION	CONSTR COST	CONTINGENC CHARGES	FINANCIAL FEES	PROFESSION FEES IN RANDS	TOTAL EXPENDITURE
				1.0%		15.00%			
	20.00			1.0%	5.0%	15.00%			
950	4806050.00	108420.00	2000000.00	6	288363.00	5462974.65	260141.65	1119446.20	9.0% 491667.72	9074088.57
950	5415000.00	286100.00	3000000.00	7	379050.00	6384157.50	304007.50	1407623.63	9.0% 574574.17	11366355.30
950	5700000.00	324060.00	3400000.00	8	456000.00	6804063.00	324003.00	1530609.45	9.0% 612365.67	12347038.12
950	6175000.00	313780.00	3400000.00	8	494000.00	7332129.00	349149.00	1609819.35	9.0% 659891.61	13001839.96

I N C O M E

LETTABLE OTHER SPACE	LETTABLE RATIOS	COVER PARKING sq.m area	OPEN PAR no of ba	RESID AREA	RETAIL	OFFICE	INDUSTRIAL	WAREHOUSE	RETAIL/OFFI MIX	COVERED PARKING	OPEN PARKING

	64.77%	31.78%	24	62	3.43%	30.00	0.00	28.00	0.00	1.00	120.00	60.00
9.50												
	95.00%	0.00%	24	166	5.00%	30.00	21.00	28.00	15.00	1.00	0.00	60.00
9.50												
	95.00%	0.00%	24	188	5.00%	30.00	21.00	28.00	15.00		0.00	60.00
9.50												
	95.00%	0.00%	24	182	5.00%	30.00	21.00	28.00	15.00		0.00	60.00
9.50												

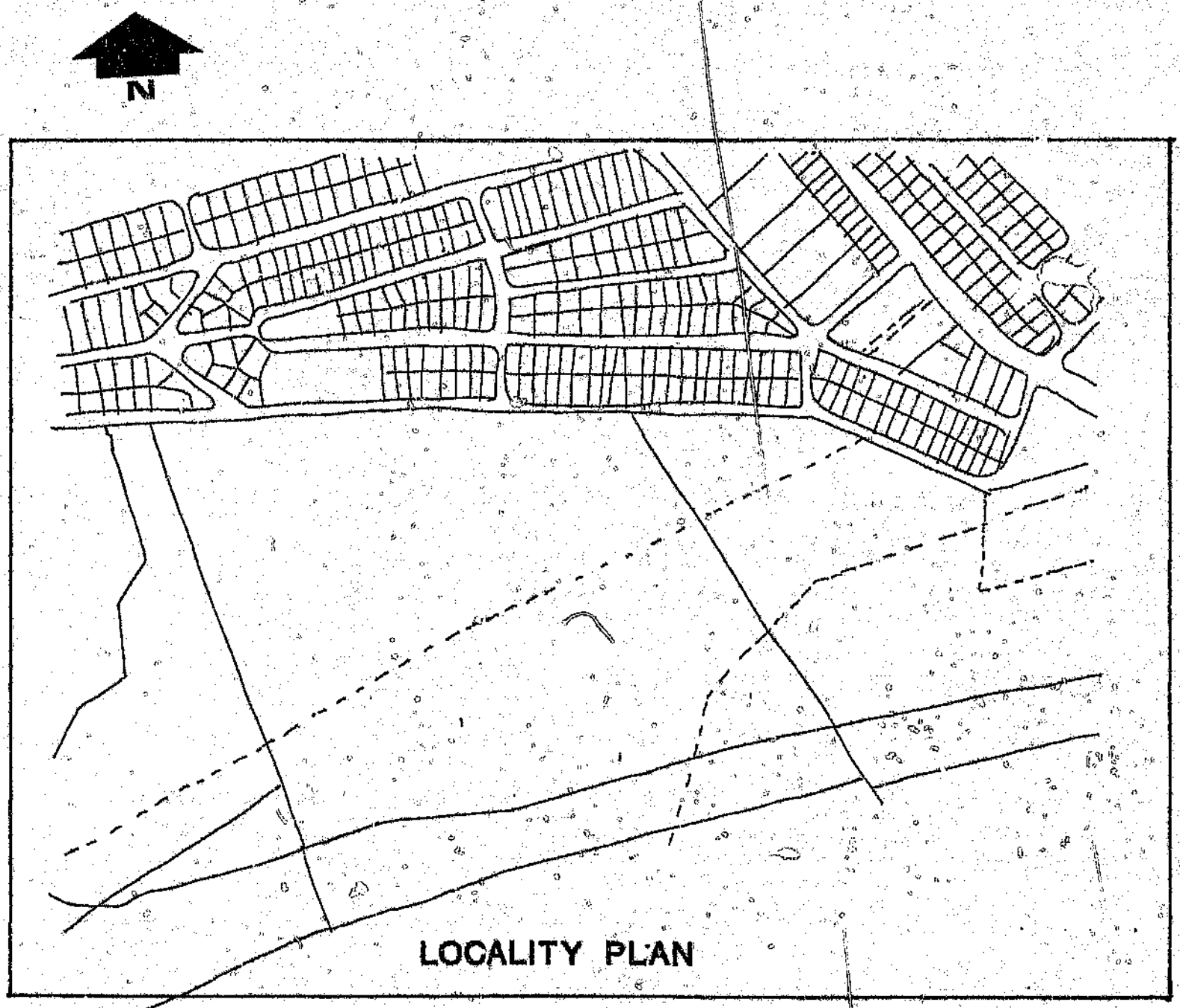
75.88

3450.00	3277.50	1608	1488.00	173.50	513000.00	0.00	622440.00	0.00	918000.00	96480.00	44640.00
19779.00											
5700.00	5415.00	0	3984.00	285.00	547200.00	71820.00	1117200.00	51300.00	1676592.00	0.00	119520.00
32490.00											
6000.00	3700.00	0	4512.00	300.00	752400.00	71820.00	925680.00	102600.00	1182960.00	0.00	135360.00
34200.00											
6500.00	6175.00	0	4368.00	325.00	513000.00	71820.00	1308720.00	102600.00	1922112.00	0.00	131040.00
37050.00											

RETURNS

CAPITALIZATION RATE	RESIDUAL LAND VALUE	RESIDUAL LAND VALUE ($/SQ.M)	PRICE
11.70%			
13.50%			
12.84%			
13.20%			

11079820.51	2005731.95	471.94	2005731.95
14366888.89	3000533.59	415.41	3000533.59
15748130.84	3401092.72	414.06	3401092.72
16395681.82	3393841.86	413.18	3393841.86


N
LOCALITY PLAN

CASE STUDY 3
SOUTHCREST EXT 3

1.0 INTRODUCTION

The 37.7561 Ha site is located immediately to the south of Southcrest Township in the north western corner of the Alberton municipal area, on the peak of the Kliprivіersberg range of hills which run from east to west through the property.

The N103 Johannesburg Southern Bypass and Sybrand van Niekerk Freeway are situated 600 metres to the south of the proposed township and the Alberton town centre approximately 2 km to the south east.

The township area slopes downwards to the south and east and the land is generally very rocky and broken with some steep and deep rifts. There are however certain portions with reasonable slopes which are not only capable of being developed for middle to high density housing development, but include individual homes. The magnificent views which the site enjoys would enhance the value of the proposed township and be incorporated into the marketing strategy of the development.

2.0 PROCESS

With particular reference to the site, the opportunities are inherent to provide a development strategy that will from inception provide the framework for guiding the form and nature of the development.
It is this strategy that will be outlined as the bases of the proposal.

S T A G E 1

2.1 SITE APPRAISAL AND DATA COLLECTION

A sub-regional analysis will be undertaken to establish the relevant criteria for development. This will include broader issues that will have an impact on and reflect upon the propensity of the development. Issues relating to location, access, traffic flows and infrastructural capacities will be investigated.

Further, a site sensitivity analysis will be undertaken to define not only the practicality for development, but to assess the appropriate landuse and spatial dispositions for the various typologies. This will entail aerial and topographical surveys and general site analysis.

S T A G E 2

2.2 DEVELOPMENT PROPOSALS

Options will be explored and the optimum development strategy selected. Urban Design modelling techniques will be implemented in this process, which will include broad feasibility studies and development phasing.

A development framework will be created which will form part of the Urban Design principles for the township. This will take the form of design layouts with respective directives and controls relating to road systems, landuse and activities, open space system, vegetation, security and public access, service infrastructure, individual site boundaries, and development densities.

A conceptual framework directing the form and architectural character of the development will express the 'VISION' for the township. This would include design layouts and architectural services if so required.

S T A G E 3

2.3 PROCLAMATION

The proposal will follow the Section 125 application for township proclamation procedures.

S T A G E 4

2.4 IMPLEMENTATION

Upon approval of the Township application, development may commence as guided by the development framework and design layout established in STAGE 1 with the appropriate phasing and development strategies.

3.0 FEES FOR TOWNSHIP DEVELOPMENT

PROFESSIONAL FEES

a. URBAN DESIGN and ARCHITECTURAL FEES

The following is a preliminary breakdown of ARCHITECTURAL fees for group housing :

Residential 2

No. of units	40
No. of prototypes	2
Area of unit	100 sq.m
Estimated total cost/unit	R 96 810.00

PROVISIONAL FEES R 104 994.00

Residential 3

No. of units	60
No. of prototypes	3
Area of unit	87 sq.m
Estimated total cost/unit	R 86 663.00

PROVISIONAL FEES R 104 994.00

Residential 4

No. of units	250
No. of prototypes	4
Area of unit	70 sq.m

Estimated total cost/unit R 68 734.00

PROVISIONAL FEES R 409 657.12

The fee structure is in accordance with the Recommended Tariff of Fees as laid out by the Government Gazette No.13707 of 3 January 1992.

The following is an estimate of URBAN DESIGN fees for Stages 1 and 2 ;

Fees are based on hourly rates as recommended under Clause 14.1 (Appendix 3) of the same Gazette.

PROVISIONAL FEES R 32 500.00

Allow 10% for disbursements on Architectural and Urban Design services (plan prints, photostats, travel, application fees, etc.). An amount for VAT charges should also be allowed for.

b. PLANNING

i. Layout	R 26 000.00
ii. Administration	R 50 000.00
iii. Section 125 Application	R 2 500.00
TOTAL	R 78 500.00

Allow 10% for disbursements (plan prints, photostats, travel, application fees, etc.) = R 7 650.00

c. **SURVEY**

i. Contour plan (if applicable) R 7 500.00

(dependant on topographical conditions)

ii. General Plan R 20 000.00

TOTAL R 27 500.00

This estimate does not allow for any survey work related to subdivision of the Residential 2, 3 or 4 sites when development takes place. Allow 10% for disbursements (plan prints, photostats, travel, application fees, etc.) = R 4 125.00

The total estimate costs thus amount to R117 975.00 (say R120 000.00). A final cost estimate can be provided once more details are known. The expectations are that the total costs could be less than the estimate provided. It should be noted that no provision has been made for VAT.

d. **CIVIL ENGINEERING**

WORKS

RESIDENTIAL (Unit costs)

	Medium Cost	Upper Market
Services	R 6 500.00	R 8 000.00
Electrical	R 3 800.00	R 4 400.00

Services	(350 (medium income)x 6500) + 20(high income)x 8000	R 2435000.00
Electrical	(350 x 3800) +(20 x 4400	R 1418000.00
	Total	R 3853000.00

FEES

Fee calculated for the above:
R 49 630 + 7% + Disbursements R 368 000.00

(The average cost for a services stand would therefore be R 11 400.00 per stand.)

3.1 BULK SERVICE INFRASTRUCTURE CONTRIBUTIONS

RESIDENTIAL DEVELOPMENT

	Sewerage	R 148.60 /ha
	Water	R 443.90 /ha

COMMERCIAL

	Sewerage	R 498.40
	Water	R13 317.00

Germiston Purification Contributions

RESIDENTIAL

	R1	R 430.79 /unit
	R2	R 344.63 /unit
	R3	R 344.63 /unit
	R4	R 287.19 /unit

COMMERCIAL R 3 144.77 /Sellable ha.

ELECTRICAL SERVICES R250 000.00

4.0 CONCLUSION

The proposal is based on a development encompassing approximately 7 hectares of the site. Development is essentially based on group housing, individual houses, and the potentiality of a business stand for a local shopping precinct. This will provide a diversity not only in the character of the development, but allow development to occur along more demanding parts of the site.

Residential 1, 2, 3, 4 have been suggested with an emphasis towards higher density development (RESIDENTIAL 4).

At this preliminary stage then Township may consist of the following;

1 Erf of 5ha 'Residential 4' landuse (250 dwelling units) (Coverage = 40%, floor area ratio = 0.6)

1 Erf of 5ha 'Residential 3' landuse (60 dwelling units) (Coverage = 30%, floor area ratio = 0.4)

1 Erf of 2ha 'Residential 2' landuse (40 dwelling units) (20 Units per hectare)

20 Residential erven of approx. 1'000m sq.

1 Erf of 1ha for 'Business' landuse

Total extent: 24 erven on 12ha + 2ha for roads = 14ha

The study outlines the following with respect to the group housing
component of the development;

RESIDENTIAL 2

No of units	40
Area of unit	100
Erf size	400
Cost / sq.m	750
Estimated total cost	R 96 810.00
Estimated selling price	R122 926.00

RESIDENTIAL 3

No of units	60
Area of unit	87
Erf size	290
Cost / sq.m	750
Estimated total cost	R 86 663.00
Estimated selling price	R110 202.00

RESIDENTIAL 4

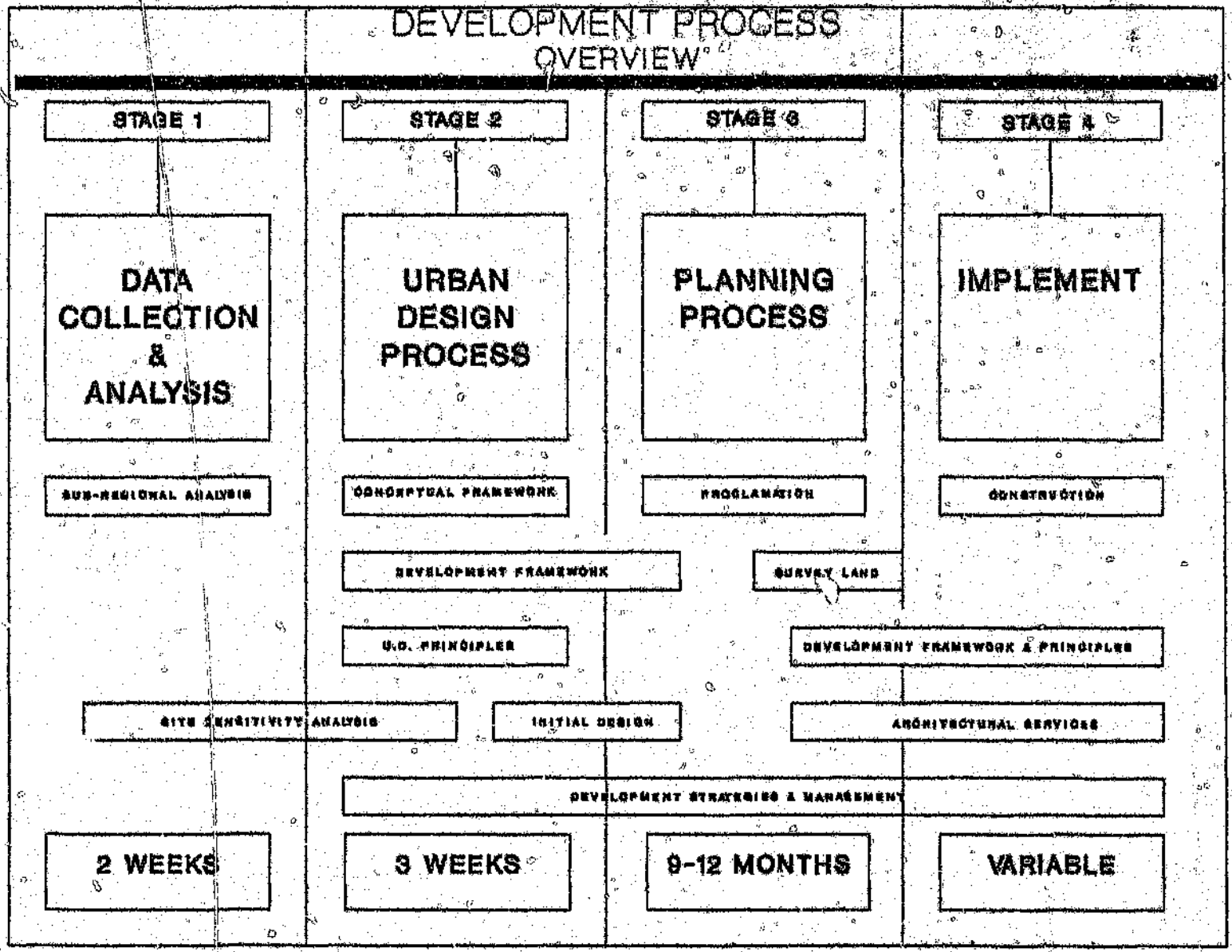
No of units	250
Area of unit	70
Erf size	175
Cost / sq.m	750
Estimated total cost	R 68 734.00
Estimated selling price	R 86 274.00

It is noted from the preliminary study that RESIDENTIAL 4 development would provide the optimum investment returns, whilst RESIDENTIAL 2 development performs the poorest, All however show a favourable development return. Land allocated for RESIDENTIAL 1 provides the potential for returns on land that would be otherwise

unsuitable for higher density development. A shopping precinct and the provision for open space systems would allow for public access, and further enhance the overall vision of the area.

The management with respect to development and financial strategies are seen as sensitive and critical elements that will play a major role in determining the ultimate success of the venture.

DEVELOPMENT PROCESS OVERVIEW



NSHIP DEVELOPMENT															
UTHCREST EXT 3	res 8					res 4					res 8				
BERTON	RESIDENT					RESIDENT					RESIDENT				
	CLUSTERS					TOWNHOUSE					TOWNHOUSES				
TE AREA		28000	5%				50000	12%				20000	5%		
NSOLIDATION															
BDIVISION		377561					377561					377561			
NSITY	60 p/hectareunits					90 p/hectareunits					60 p/hectare units				
VERAGE	30%	87	actual			40%	70	actual			30%	131	actual		
.R.	0.4	5220	0.26			0.4	17500	0.35			0.4	4000	0.2		
BAYS REQUIRED															
OF BAYS															
OF ERVEN		60	60				250	250				40	40		
F SIZE		290					175					435			
ERF OF LAND	87%	17400				88%	43750				87%	17460			
ADS	8%	1600				8%	3750				8%	1600			
NDSCAPING	5%	1000		150		5%	2500				5%	1000			
FRASTRUCTURE															
ND COSTS		rands	metre	r/sq.m			rands	metre	r/sq.m			rands	metre	r/sq.m	
te clearance		120000		6			350000		7			120000		6	
te terracing		0		0			0		0			0		0	
etain walls		0	400	0			0	0	225			0	0	225	
total		120000					350000					120000			
TE SERVICES															
ard landsc		120000		75			281250		75			120000		75	
oft landsc		25000		25			62500		25			10000		10	
ewer reticulati		45000	300	150			270000	1800	150			37500	250	150	
ater reticulati		45000	300	150			270000	1800	150			37500	250	150	
ire mains		21000	150	140			126000	900	140			0	0	140	
torm water		17415	129	135			38880	288	135			16605	123	135	
lectr retic		240000	125	4000			1000000		4000			160000		4000	
illing						1.8	90000	500	100						
ecurity							50000								
total		513415					2188630					381605			
o/f.a.r/size/r/	cov	f.a.r	height	size		cov	f.a.r	height	size		cov	f.a.r	height	size	
ROTOTYPE 1		0.30	1	87			0.40	1	70			0.2		100	
ROTOTYPE 2		0.30	1	87			0.40	1	70			0.2		100	
ROTOTYPE 3		0.30	1	87			0.40	1	70			0.2		100	
ROTOTYPE 4		0.30	1	87			0.40	1	70			0.2		100	
o s t/type				r/sq.m					r/sq.m					r/sq.m	
ROTOTYPE 1		69600		800			52500		750			75000		750	
ROTOTYPE 2		69600		800			52500		750			75000		750	
ROTOTYPE 3		69600		800			52500		750			75000		750	
ROTOTYPE 4		69600		800			52500		750			75000		750	
o s t	no					no					no				
ROTOTYPE 1	15	1044000				60	3150000				10	750000			
ROTOTYPE 2	15	1044000				60	3150000				10	750000			
ROTOTYPE 3	15	1044000				60	3150000				10	750000			
ROTOTYPE 4	15	1044000				70	8675000				10	750000			
UILDING COST		4176000					13125000					3000000			
AND COSTS		120000					350000					120000			
ITE SERVICES		513415					2188630					381605			
AND IMPR COST		4809415					15663630					3501605			
SCALATION															
re-contract	2	144282				2	469909				2	105048			

cost-contract	7	868494		10	1174772		7	188884			
fin charges-cons	5%	621789		5%	846243		5%	196889			
fin charges-land	0%	0		0%	0		0%	0			
LOSS OF CAPITAL		6090			25000			6000			
contingency	2.5%	180286		8.5%	991691		12.5%	87540			
marketing	4%	169642		4%	131021		4%	196839			
PROFESS FEES	4%	233889		4%	466846		4%	140069.2			
TOTAL COSTS		6068648.	land(r/sq.m)		19698461	land(r/sq.m)		4479939	land(r/sq.m)		
RES LAND VALUE		605840	10.10		698883	13.96		53525	3		
LAND PRICE		75000	3.75		195000	3.9		75000	3.75		
SELLING PRICE											
PROTOTYPE 1	20%	1086086		80%	81888		20%	115212			
PROTOTYPE 2		1086086			81888			115212			
PROTOTYPE 3		1086086			81888			115212			
PROTOTYPE 4		1086086			81888			115212			
RENTALS											
PROTOTYPE 1											
PROTOTYPE 2											
PROTOTYPE 3											
PROTOTYPE 4											
INFR/UNIT COST		10557			10155			12540			
FEES/UNIT COST		3893			2506			3208			
LAND/UNIT COST		1850	17879		799	15043		1875	21015		
BULK CTR-PR/UNIT		944.63			287.19			344.63			
NET INCOME		6361570			20471971			4608484			
NET EXPENDITURE		6157930			19773748			4554959			
NET YIELD/INCOME	3%	203640		4%	698223		1%	53525			

WNSHIP DEVELOPMENT UTHCREST EXT 3 BERTON	res 3 RESIDENT CLUSTERS			res 4 RESIDENT TOWNHOUSE			res 2 RESIDENT TOWNHOUSES		
TE AREA	20000	5%		50000	13%		20000	5%	
NSOLIDATION									
BDIVISION	377561			377561			377561		
NSITY	60 p/hectareunits			90 p/hectareunits			60 p/hectare units		
VERAGE	30% 87		actual	40% 70		actual	30% 131		actual
.A.R.	0.4 5280		0.86	0.4 17500		0.35	0.4 4000		0.2
DAYS REQUIRED									
O OF BAYS									
O OF ERVEN	60	60		250	250		40	40	
RF SIZE	290			175			435		
ERF OF LAND	87% 17400			88% 43750			87% 17400		
OADS	8% 1600			8% 3750			8% 1600		
ANDSCAPING	5% 1000		150	5% 2500			5% 1000		
NFRASTRUCTURE									
AND COSTS	rands	metre	r/sq.m	rands	metre	r/sq.m	rands	metre	r/sq.m
ite clearance	120000		6	350000		7	120000		6
ite terracing	0		0	0		0	0		0
etain walls	0	400	0	0	0	225	0	0	225
total	120000			350000			120000		
ITE SERVICES									
ard landsc	120000		75	281250		75	120000		75
oft landsc	25000		25	62500		25	10000		10
ewer reticulati	45000	300	150	270000	1800	150	37500	250	150
ater reticulati	45000	300	150	270000	1800	150	37500	250	150	
ire mains	21000	150	140	126000	900	140	0	0	140
torm water	17415	129	135	38880	288	135	16605	123	133
lectr retic	240000	125	4000	1000000		4000	160000		4000
alling				1.8 90000	500	100			
ecurity				50000					
total	513415			2188630			381605		
o/f.a.r/size/r/	cov f.a.r	height	size	cov f.a.r	height	size	cov f.a.r	height	size
ROTOTYPE 1	0.30	1	87	0.40	1	70	0.2		100
ROTOTYPE 2	0.30	1	87	0.40	1	70	0.2		100
ROTOTYPE 3	0.30	1	87	0.40	1	70	0.2		100
ROTOTYPE 4	0.30	1	87	0.40	1	70	0.2		100
o s t/type			r/sq.m			r/sq.m			r/sq.m
ROTOTYPE 1	69600		800	52500		750	75000		750
ROTOTYPE 2	69600		800	52500		750	75000		750
ROTOTYPE 3	69600		800	52500		750	75000		750
ROTOTYPE 4	69600		800	52500		750	75000		750
o s t	no			no			no		
ROTOTYPE 1	15 1044000			60 3150000			10 750000		
ROTOTYPE 2	15 1044000			60 3150000			10 750000		
ROTOTYPE 3	15 1044000			60 3150000			10 750000		
ROTOTYPE 4	15 1044000			70 3675000			10 750000		
UILDING COST	4176000			13125000			3000000		
AND COSTS	120000			350000			120000		
ITE SERVICES	513415			2188630			381605		
AND IMPR COST	4809415			15663630			3501605		
SCALATION									
re-contract	2 144282			2 469907			2 105048		

ost-contract	7	252494		10	1176972		3	183824			
in charges-cons	5%	221989		5%	876742		5%	176828			
in charges-land	0%	0		0%	0		0%	0			
OSS OF CAPITAL		6000			29250			6000			
ontingency	2.5%	120035		2.5%	391591		2.5%	87540			
arketing	4%	180517		4%	138933		4%	194162			
ROFESS FEES	4%	239584		4%	626545		4%	140064.2			
OTAL COSTS		6093517.	land(r/sq.m)		19585271	land(r/sq.m)		4489783	land(r/sq.m)		
ES LAND VALUE		600600	30.03		1833166	36.66		289304	14		
AND PRICE		75000	3.75		195000	3.9		75000	3.75		
ELLING PRICE											
ROTOTYPE 1	30%	112823		28%	86457		28%	121352			
ROTOTYPE 2		112823			86457			121352			
ROTOTYPE 3		112823			86457			121352			
ROTOTYPE 4		112823			86457			121352			
ENTALS											
ROTOTYPE 1											
ROTOTYPE 2											
ROTOTYPE 3											
ROTOTYPE 4											
NFR/UNIT COST		10357			10155			12540			
EES/UNIT COST		3893			2506			3502			
AND/UNIT COST		1250	17879		780	15843		1875	21015		
ULK CTR-PR/UNIT		344.63			287.19			344.63			
ET INCOME		6769405			21614284			4854087			
ET EXPENDITURE		6168805			19781058			4564783			
ET YIELD/INCOME	10%	600600		9%	1833166		6%	289304