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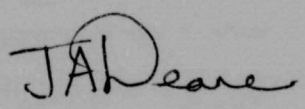
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A MODEL FOR THE DENSIFICATION OF AN INNER CITY SUBURB. A CASE STUDY OF JEPPESTOWN, JOHANNESBURG

by

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Submitted in fulfilment of the requirements for the degree of Master of Arts in the Department of Geography and Environmental Sciences, University of the Witwatersrand, Johannesburg.

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ABSTRACT

Recent changes in the South African political scene have served to renew the impetus by theorists and policy makers in the idea of the compact city, which entails the intensification of land uses and activities. A major component of intensification is the increase in residential densities. Historically, urban growth in South African cities has been shaped by policies of racial segregation, resulting in high density residential settlements on the urban periphery, so that distances to work opportunities and urban facilities are excessive, and transportation expenditure, massive. With the move away from apartheid planning principles, a major change in approach to urban development is required in order to assist in redressing the spatial and structural inequalities. In addition, higher residential densities offer advantages for South African cities by limiting the amount of land consumed by cities, by providing additional accommodation in the urban areas with improved accessibility to urban facilities, and by facilitating the efficient provision of infrastructure. Urban planners are faced with the challenge of managing the process of increasing residential densities in an appropriate manner which keeps in tension the benefits of accommodating additional people while maintaining quality of life.

In this thesis, a model for the densification of an inner city suburb is presented. The model is illustrated by means of a case study of Jeppestown, Johannesburg. The major components of the model include the quantification of existing conditions, the identification of densification opportunities and the evaluation of the impact of increasing residential densities. A scenario-based approach was used to facilitate the testing of options generated by planners, policy makers or communities. It also enabled the benefits of accommodating additional people to be weighed against living space, garden space and degree of privacy. In the case study, the model showed that by using medium-rise medium density housing options, the population of the suburb could be doubled whilst maintaining reasonable levels of living space, private recreational space and privacy.

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LIST OF ABBREVIATIONS

CBD = Central Business District
pph = people per hectare
US = United States
USA = United States of America
OPEC = Oil and Petroleum Exporting Countries
ANC = African National Congress
CWMC = Central Witwatersrand Metropolitan Chamber
RERC = Real Estate Research Corporation
ppa = people per acre
DAG = Development Action Group
UPRU = Urban Problems Research Unit
km = kilometre
JOMET = Johannesburg Metropolitan
GIS - Geographical Information Systems
ha = hectare
Jhb - Johannesburg
HSRC = Human Sciences Research Council
m^2 = square metres
NewHco = New Housing Company
No. = Number
FSR = Floor Space Rate

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CHAPTER 1: INTRODUCTION

CONTEXTUALISATION OF RESEARCH

The dismantling of apartheid legislation in South Africa has served to renew the impetus by planners and urban policy makers in the idea of the compact city, which entails the intensification of land uses and activities. A major component of intensification is the increase in residential densities. The word 'densification' rarely appears in the geographical or urban studies literature, except for isolated conference proceedings and unpublished documents of South Africa origin. However, from an interpretation of wider urban studies, densification can be defined as the process in which residential densities are increased to an 'appropriate' population density to create housing opportunities close to work opportunities and existing urban facilities[1]. In most of the literature, the phrases 'increases in residential densities' and 'higher residential densities' are referred to. In Australia, the term 'urban consolidation' is used.

There are differing views as to what constitutes 'high' and 'low' density, for it is ultimately a value judgement which will vary considerably between countries and according to local conditions. Figures quoted as 'high' by Australia standards, may be medium density elsewhere (Kennedy and Meaton, 1972). Even in the South African context, there are differing views as to what constitutes 'high density'. For example, the President's Council (RSA, 1992: 5.2.4) suggests 20 dwellings per hectare is a fairly high gross density. Dewar and Uytenbogaardt (1991), on the other hand, suggest a figure of approximately 120 dwellings per gross hectare (approximately 540 people per hectare assuming an occupancy of 4.5 per dwelling unit). In South Africa, 'high density' generally refers to densities of approximately 300 people per hectare (pph) and above (Senior, 1984; Behrens, 1993; Arrigone, 1995). The upper limit would be approximately 700 pph, such as that found in the high-rise high density suburb of Hilbrow in Johannesburg (Morris, 1994; Urban Foundation,

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[1] Meiklejohn (1992) and Behrens (1993) distinguish between densification and infill. Meiklejohn (1992, 2) defines densification as "the process whereby the density of an urban development in, or near, the Central Business District is increased". She defines infill as a "complementary process whereby vacant or under-utilised land within the boundary of the existing city is developed" (Meiklejohn, 1992, 3). Behrens (1993, 7) refers to densification as "measures promoting higher residential densities in existing built urban areas" and infill as "measures promoting the development of fairly large vacant sites within built urban areas".

1988). In Hong Kong, however, high densities would typically begin at around 800 pph. The literature also distinguishes between built density (the number of units per hectare) and population density (the number of people per hectare). In this thesis, the word 'higher' residential densities refers to higher population and built densities than the present, and it refers to the use of attached and walk-up dwelling units rather than single-storey dwellings. There is therefore an increase in the gross residential density of an urban area. The phrase 'low density' in this thesis is generally used in association with the phenomenon of 'urban sprawl', characterised by single-storey individual housing. By contrast, 'high density' is usually used in association with the idea of a 'compact city'.

Density can be described according to a number of measures such as floor space rates, people per hectare, units per hectare and bedspaces per hectare. For the purposes of this study, five *densification indicators* were chosen: additional household units, additional population and changes in net, gross and town density. Taken alone, the densification indicators may be misleading, as they are not necessarily an accurate indicator of actual living conditions, such as overcrowding. For this reason, quality of life indicators were used as well. Three *quality of life* indicators were chosen: people per habitable room, which is indicator of the degree of privacy, floor space rates, which are an indicator of the amount of living space, and garden space per person, which is an indicator of the amount of private recreational space per person (see Chapter 4 for details).

In South African cities, urban growth was largely shaped by policies of racial segregation, resulting in high density residential settlements on the urban periphery, which has led to excessive commuting distances to places of employment and urban facilities, and massive transportation expenditure (Lemon, 1991). Generally these areas have a low built density, but high population density as a result of overcrowding. With the move away from apartheid planning principles, a major change in approach to urban development is required in order to assist in redressing the existing pattern of residential development. A compact city, where urban growth is directed inward at higher residential densities, will assist in redressing the current imbalances that have resulted from apartheid policies. Higher residential densities will result in the provision of additional accommodation in the urban areas, which will limit the amount of land consumed by South African cities. Increased residential densities will also

result in improved accessibility to urban facilities and the cost-effective provision of infrastructure. Urban planners are faced with the challenge of managing the process of increasing residential densities in an appropriate manner which keeps in tension the benefits of accommodating additional people, while maintaining quality of life. In planning for higher residential densities, a balance therefore needs to be achieved between accommodating large numbers of additional people, achieving a satisfactory living environment, and ensuring affordable costs.

Largely due to safety and security reasons as well as affordable costs, in South African there is already a strong move towards group housing in the form of duplexes, simplexes, cluster and row housing, as well as two and three storey walk-ups (Rode, 1990;1992; Behrens, 1993). There is therefore a 'natural' process of densification occurring in many South African cities. This process needs to be managed in order to facilitate the densification process and to steer densification to particular parts of the city where it would be most advantageous. While a number of recent policy documents promote a compact city and higher residential densities (the Development Facilitation Bill (Republic of South Africa, 1994a), the White Paper on Housing (Republic of South Africa, 1994b), World Bank (1993)), only sparse literature exists on *how* to increase residential densities. This obvious gap, particularly in South African literature, directs the focus of this research.

AIMS

Set against the increasing recognition of the benefits of compactness, this thesis offers a model for the testing of increasing residential densities in inner city areas of South African cities. The case study of Jeppestown is used to demonstrate how densification can be achieved without fundamentally disrupting the existing residential character. The study aims to develop a tool to achieve a balance between increased residential densities while at the same time maintaining or improving the quality of life. Appropriate densities for Jeppestown are therefore targeted, and not the highest possible density[2]. The model forms only a small part of the total development planning process. The broader planning process, which

[2] Residential developments of greater than four storeys (high-rise) are not considered, due to the costs of installing and maintaining elevators, which are unlikely to be affordable to Jeppestown residents unless substantial subsidies are given (See Chapter 3).

includes the implications for demands on social facilities, infrastructure and financing, does not fall within the scope of this research.

OBJECTIVES

The first objective of the study is to comprehend the historical factors, the local physical and social characteristics of the city which are important for understanding present densification trends in Jeppestown. A second objective will be to explore the potential for increased residential densities for Jeppestown, by identifying ways of achieving higher residential densities. A third objective is quantify densification opportunities and develop a number of scenarios for increasing residential densities in Jeppestown. A final objective is to assess the suitability of the scenarios according to density, quality of life and dwelling costs.

JOHANNESBURG AND THE JEPPESTOWN STUDY AREA

The 'Jeppestown area', which is found on the periphery of the inner city of Johannesburg, forms the study area for this research (Figure 1.1). This area consists of Jeppestown, Jeppestown South, Wolhuter, Doornfontein North and Fairview. It is bounded by Troyeville and Kensington to the north, Malvern to the east, the Benrose light industrial area to the south, and City Suburban to the west (Figure 1.2).

For a number of reasons the Greater Johannesburg metropolitan area was chosen as the area in which the study area would be selected. Johannesburg lies at the core of the most rapidly expanding region of Southern Africa, Gauteng. In this region, increased residential densities will facilitate in enabling the additional people to be housed within the existing boundary of the city, rather than on the urban periphery. Since the discovery of gold in Johannesburg just over a hundred years ago, the city has expanded from a compact, rectangular shape, measuring two kilometres from east to west and one and a half kilometres from north to south (Hart, 1984), to a sprawling metropolis with a diameter of approximately forty kilometres.

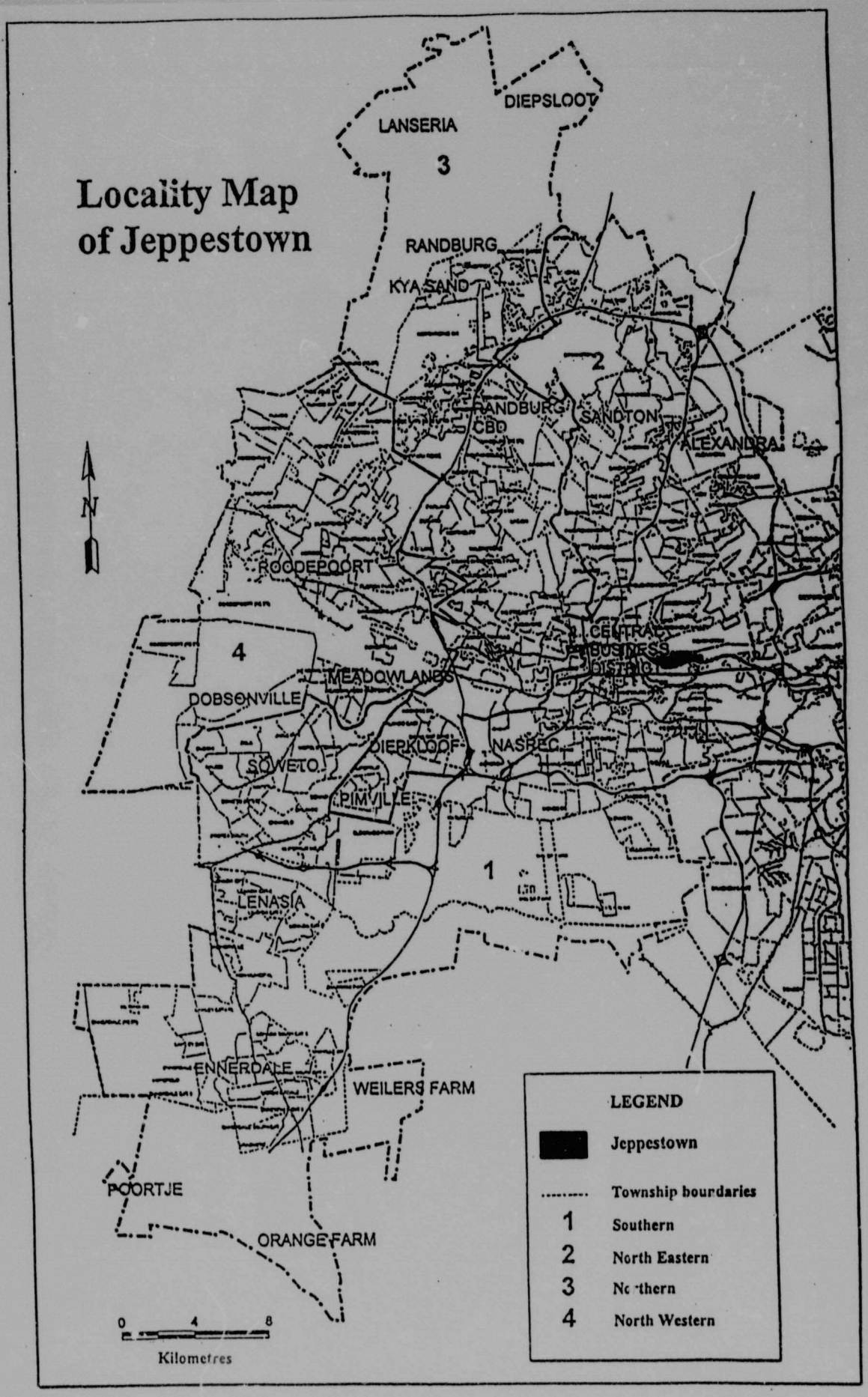


Figure 1.1: Locality Map of Jeppestown (Source: Johannesburg City Council, 1995).

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