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A model for the densification of an inner city suburb : a case study of Jeppestown, Johannesburg

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It was the reaction against rationality, functionality and efficiency that marked the beginning of what has been termed 'post-modernism'. There is much dispute concerning the meaning of the term and as to when post-modernism began. For example, Cherry (1988) argues that the modernist city maintained its dominance until about the 1960s. Jencks (1984, 9), on the other hand, dates the end of modernist architecture as 3:32 pm on July 5th 1972 when Pruitt-Igoe housing development in St Louis was demolished as it was an unliveable environment for the low-income people it housed (Harvey, 1989). Jameson (1984) says that the post World War Two era signalled the end of modernism. Certainly the rapid increase in the use of the private car in the 1950s and 1960s was primarily responsible for a dispersed, low density form of urban growth known as 'urban sprawl'. In the United States, one single megalopolis sprawls on the east coast from south of Washington, D.C., to north of Boston. In America, the increase in automobile ownership was paralleled by a vast expansion of the nation's highway system resulting in increased commuting distances. Suburban residence for city workers therefore became more feasible. Other changes that took place in the post World War Two era include the rise in liquid fuel prices in the 1970s, brought about by the OPEC countries. This led to the contention that a more compact city form would be advantageous (Bunker, 1987). In the 1970s, the recognition of the many of the limits of urban sprawl, such as limits to fiscal and environmental resources as well as increased commuting costs, resulted in a move towards more compact cities (Windsor, 1979).

In the 1990s there have been important criticisms of the urban sprawl and the Garden City movement on environmental grounds, which has contributed towards the move to more compact cities. The European Commission's Green Paper on the Urban Environment (Commision of the European Communities, 1990) presented the case for compact cities and criticised the notion of peripheral development on environmental and social grounds. In 1991, Friends of the Earth and the Policy Studies Institute have condemned the wastefulness of garden cities and have advocated higher densities in existing cities (Elkin, McLaren and Hillman, 1991). The renewed interest in preservation of the historic past and environmental aspects is characteristic of post-modernism (Cherry, 1988), as is the renewed interest in the compact city.

OTHER FACTORS AFFECTING RESIDENTIAL DENSITIES

When considering the densification of existing areas such as Jeppestown, the theoretical literature emphasises the importance of understanding the physical, social and economic characteristics of the city. These characteristics, which include urbanisation rates, the amount of land available for densification and land prices, are discussed in this section.

The amount of land available for densification is affected by physical (rivers, geotechnical factors), as well as political factors. Topography and the shortage of available land has influenced the pattern of residential densities in small countries such as Japan and Britain. Japan has had a history of high-rise high density living (densities of 4 000 pph are not uncommon in Japan). Japan has a limited supply of land and residential land prices that are much higher than any other advanced industrial country (Kirwin, 1982). The high prices of Japanese land has meant that only a small percentage of Japanese can afford singly-family housing. Consequently, most Japanese live in high-rise high density flats. Residential densities in Britain have been influenced by the shortage of available land, resulting in medium-density housing in the form of semi-detached or row housing. Field (1989) shows that the move towards high-rise high density housing in Singapore was primarily influenced by the country's size and demography. In Rio de Janeiro, topography has been a key constraint upon the city's urban development. It has seen the wealthier sections of the population willing to pay a higher price to live in the attractive southern zone, even in this meant living in high-rise apartments at very high residential densities (Gilbert, 1988). In South Africa, there has not been a shortage of land such as in Japan and consequently densities are lower.

In countries where there is no shortage of land, high-rise developments are used sparingly. The resistance to high density living is founded in concerns over feelings of overcrowding, oppression, alienation, social isolation and lack of privacy that have emerged from sociological and psychological studies of high-rise developments (Schutte, 1984; Rapoport, 1975; Swart, 1972; Cuthbert, 1985; Jacobs, 1962; Blowers, Hamnett and Sarre, 1974). For example, high-rise generally appears to be unsuitable for families with children.

In Africa, where land is plentiful, low-income housing is interspersed with cultivation and spacious high-income suburbs. Low density development in African cities is not only a reaction to plenty of land, it is also often a reaction to the imposition of first world planning concepts such as the Garden City idea and the Neighbourhood Unit idea. For example in Lusaka, the traditional white suburbs were planned at very low densities according to garden city principles, which has resulted in increased servicing costs (Rakodi, 1986). In Africa, dwellings are single-storey, and therefore most residential growth continues to be horizontal (Underwood, 1986; O'Connor, 198). In certain instances, such as in Zimbabwe, a wide variety of formal low cost residential units can be found today, including apartments, terraced housing, semi-detached and detached houses.

Demography, life cycle, culture and people's preferences are social factors influencing residential densities (Marsh, 1972; Mills, 1986; Rapoport, 1975). Lehrman (1987) has shown the importance of life cycle in the planning of housing in Canada. He notes that an increase in the number of non-family households, empty nesters, single parent families and elderly people in Canada has resulted in fewer space needs and consequently smaller housing units. Concerning the needs and preferences of the residents, Pruitt-Igoe in the USA is an example of a development that did not meet the needs of the residents - an entire area comprising high-rise slab blocks was demolished by the housing authority in 1975 as the buildings were abandoned (Lewis, 1988). In recent years in South Africa there has been a greater desire for security which has seen denser residential patterns in the form of townhouses, especially in Johannesburg (Fox, 1993; Rode, 1990; 1992). The need for military defences in the form of fortifications also influenced the density of towns in that the fortifications occupied space usually greater than that occupied by the whole town. The result was that new growth could often only take place vertically. This was particularly so during the Baroque period (1600-1750) of the Renaissance when high-rise high density urban developments were found in many European towns (Mumford, 1961). Edinburgh, with its tall tenement flats, is an example of how reasons of safety and defence served to increase residential densities (Beckett, 1972).

The cost-effective provision of infrastructural services has had an impact on residential densities in Australian, Canadian, American and many Chinese cities. Newman (1992) sees

the economic dimension as the most significant factor affecting the need for a more compact city in Australia. Over recent decades a key focus of Australian planners, and to a lesser extent the general public, has been 'urban consolidation', rather than suburban spread (Freestone, 1989; Bunker, 1987). In Australia, the need for higher residential densities and more compact cities has resulted from a crisis in low density Australian cities, such as Perth, as they become less efficient economically, less sustainable in environmental terms, less socially equitable and less liveable in human terms (Newman, 1992; McLoughlin, 1991; Badcock, 1993; Houghton, 1990). In Canada, economics have also influenced residential densities. Housing in Canada has traditionally taken the form of single family units at low densities, but economics has seen some row housing and walk-up apartments at higher densities. There has been an increase in housing density in Canada from 10-15 dwellings per hectare in the 1970s to 10-36 dwellings per hectare in the 1980s (Lehrman, 1987). In Vancouver, Canada's third largest city, residential development is increasingly orientated towards denser, multiple-dwelling types. High-rise residential developments are found in the inner city (Hutton, 1994). This has resulted from the recognition of the land constraints imposed by topography, the high costs of servicing single-family housing and the high growth rate. While low density living has been a salient feature of American way of lie since the end of World War Two, there has been a re-evaluation of low density living.

Variations in investment in infrastructure has also influenced the form and density of cities. Frost (1991) distinguishes between two distinct types of city in the nineteenth and also the twentieth century in the First World. The first was the traditional high-density cities of Europe, the east coast of North America and the east coast of Australia, such as Sydney. He argues that in traditional high density cities, a high proportion of the city's capital accumulation is directed into industry so that there is little available for infrastructure and services. Housing is therefore dense. In the second type of city that Frost notes, the low-density 'new frontier' towns of west and southern North America and Australia (Perth, Adelaide and Melbourne), a far higher proportion of capital is directed into urban infrastructure, facilitating low density housing. Frost's explanation appears to be applicable to First World, not Third World countries. In the Third World generally small amounts of money are directed towards industry or urban infrastructure resulting in a higher service costs to residents which in turn results in more families occupying smaller plots. High density

squatter settlements therefore develop on the urban periphery (Balbo, 1993; Stren, 1978; Gilbert, 1993).

TRENDS AND INFLUENCES ON URBAN DENSITY IN SOUTH AFRICA

South Africa, like many cities of the developing world, is currently experiencing very rapid growth and change which is generating interest and debate on the ways our cities should develop. While most of the Third World are overcrowded and require a reduction in residential densities, South Africa is calling for 'densification' and 'compaction' of its urban centres. Residential densities in South Africans are low in comparison with international figures. Johannesburg, for example, has a very low overall density of approximately 12 people per hectare, compared to much higher town densities of some other major cities in the world (Table 2.1). Within South African cities, a density distortion exists. In 1986 Soweto, which is found on the periphery of Johannesburg, had a density seven times higher than Johannesburg (Lamont, 1991). The current low densities in South African cities have been influenced by colonial ideas, the ideas of proponents of the 'low density utopia', rapid urbanisation, segregation and apartheid ideologies, and the repeal of apartheid legislation.

Table 2.1: Town Density of Some Major Cities of the World

	Population (Millions)	**Town Density (People per Hectare)**
Detroit	4.5	8
San Francisco	4	9
Sydney	2.8	10
Johannesburg	**3**	**12**
Toronto	3	14
Los Angeles	8	14
Paris	10	15
London	10	16
New York	15	18
Moscow	10	31
Peking	5	34
Sao Paulo	11	34
Tokyo	24	46
Mexico City	17	65
Hong Kong	4.5	68
Cairo	9	74
Bombay	8	78

(Source: Morkel, 1988)

In tracing the development of urban policy and practice in South Africa, Davies' (1981) three phase classification is useful in that it traces the major effects that political policy had on urban form. Much of the literature on South ·an urban development focuses on the issue of race or apartheid planning (Maylam, 1990, Wilkinson, 1984; Davies, 1981; Lemon, 1991). Very little has been documented on the technical aspects of cities, such as the implications that apartheid planning had on density.

Local planning and building standards in South Africa have followed the British model (Arrigone, 1995). For example, in the first phase identified by Davies (1981), the settler-colonial period which lasted from the beginning of white colonisation in 1652 to the early years after the Union in 1910, planning tended to favour the location of the indigenous people on the periphery of the cites in high density townships compared to the lower density colonial areas situated closer to work opportunities (Lemon, 1991; Pirie, 1988). The townships on the periphery were characterised by high population densities, rather than high building densities. The significance of colonial planning is that it initiated the spatial pattern of existing urban residential development.

The second phase noted by Davies (1981) saw the beginning of the first conscious attempt at urban segregation, marked by the Native (Urban Areas) Act of 1923. The Act proposed that local authorities set aside land for Africans in segregated locations or Native villages where fixed tenure would be promoted (Davenport, 1991). Maylam (1990) notes that the importance of the 1923 Act lies in its effect it had on pioneering segregationist thinking, as well as the framework that it established for future legislation.

While high densities were occurring in the townships on the periphery, low density Garden City ideas were being pioneered in many South African cities. This dates back to 1917 when Richard Stuttaford, a member of the Union Cabinet, visited Ebenezer Howard in Britain to view one of Howard's projects, Letchworth. Stuttaford returned to South Africa motivating Garden City principles by maintaining that it would be economically sound to plan a town properly (wide streets, sufficient recreation space) from the beginning, instead of first planning narrow streets that would later have to be widened (Myers, 1953). Stuttaford also maintained that garden city principles would be beneficial for sanitary reasons - the flu

epidemic had accelerated new thinking about the need to reshape South African cities and towns (Mabin and Smit, 1992). He launched a Garden Citi Association and initiated the plans for the first Garden City in South Africa, Pinelands, in 1919 (Garden Cities, 1972; Mabin and Smit, 1992). Five other Garden City projects spread throughout the Cape Peninsula during the next fifty years. In the 1950s, Meadowridge, the second Garden City, was planned, and Elfindale, during the 1960s. Maylam (1995) notes the establishment of 'superior' housing areas for the aspirant black middle class in Langa in Cape Town, and Lamontville to the south of Durban. The McNamee township in Port Elizabeth was another township planned as a 'garden village', as well as Dube in Soweto which was also geared towards the urban African middle class (Parnell, 1990). The literature therefore does contain examples of townships located on the periphery that were planned as garden cities. This however, appears to be the exception, rather than the norm.

The Group Areas Act, which aimed at achieving racial segregation in all aspects of social and economic life (Saff, 1991; Lemon, 1991; Wilkinson, 1984), marked the beginning of the third phase noted by Davies. Under the apartheid ideology the state exerted far-reaching control over the rate and pattern of urban growth in South African cities (Turok, 1994). The intention, in the cities, was to create self-contained areas that were racially distinct and financially independent, with separate public amenities, administrations and infrastructure. Under the Group Areas Act of 1950, a number of policies were used to restrict black urbanisation (Wilkinson, 1984). For example, Africans had to live in townships on the periphery, and were not allowed to own property. Migration to the cities was limited by the 'pass laws' which were permits issued selectively to Africans wanting to live and work in the cities (Turok, 1994). Another strategy that the state used in the 1960s to restrict black urbanisation was the homelands policy which involved the removal of Africans from the cities to remote rural areas. Town planning procedures during the apartheid era actively sought, through racial zoning, to control the shape, location and density of development. Physical planning was one of the main means of imposing apartheid ideology on towns and cities. Local authorities had to work within the Group Areas Act, irrespective of local political preferences. A number of 'urban renewal' projects, entailing the removal of minorities to make way for the expansion of white land ownership in the inner city transition zone, were

carried out in Durban, Johannesburg and in District Six in Cape Town (Mabin and Smit, 1992, 17).

Under apartheid planning, a limited amount of land was allocated to certain race groups, which resulted in high density townships, backyard shacks and infill development such as in Soweto. Tomlinson (1990, 101) notes that one of the means employed under apartheid to restrict access to urban areas was "overcrowding to the point of intolerability". Table 2.2 shows the contrast in population density for a selected number of residential areas in the Central Witwatersrand. It shows that while Alexandra has a density of approximately 60 times higher than Sandton, Sandton only has about half the population of Alexandra (Turok, 1994). One form of high density accommodation often associated with overcrowding, and which has been given particularly strong treatment in the literature, is the mining compound. This was viewed as a convenient form of accommodating workers close to their work opportunities (Maylam, 1995).

Table 2.2: Population Density for a selected number of Residential Areas in the Central Witwatersrand

LOCAL AUTHORITY	POPULATION PER HECTARE OF DEVELOPED LAND
Predominantly black areas	
Alexandra	688
Dobsonville	229
Soweto	158
Diepmeadow	151
Predominantly white areas	
Johannesburg	44
Randburg	22
Roodepoort	14
Sandton	12

(Source: Turok, 1994)

Residential densities in South Africa have also been influenced by the changing needs and nature of families at different stages of their life. In the 1970s, the Garden City movement in South Africa pioneered the development of grouped housing for whites and established criteria for acceptable higher densities in residential layouts (Myers, 1972). The planning of Edgemead incorporated innovative forms of housing such as grouped housing, atrium houses and the traditional single detached houses (Garden Cities, 1972). Edgemead was designed in the 1970s at a predetermined population density of 37 people per hectare. After the planning of Edgemead, the Garden City of Bloubergsvlei was planned during the late 1970s.

In the mid-1980s, government policy statements encouraged higher urban density development, as attempts to bring work opportunities to the masses through the decentralisation programme did not create significant sustainable work opportunities and proved too costly. Jobs created due to decentralisation cost 3-4 times the establishment and running cost of their metropolitan equivalent. The President's Council (1985, 11.81) noted the importance of promoting shorter commuting distances by increasing residential densities and 'filling in' buffer areas. The White Paper on Urbanisation (Republic of South Africa, 1986), which centred around ordered, planned urbanisation, recommended the striving towards a more compact urban structure and higher residential densities. It advocated "matching residential areas and places of employment as closely as possible in order or to minimise travelling distances and times" (Republic of South Africa, 1986). In 1990, the Urban Foundation (1990a, 7) noted that "seventy percent of central Johannesburg's employees are black and yet there are no centrally located legal residential opportunities available for the black population". Greater Soweto houses approximately 60 percent of the Metropolitan Region's population, but only 10 percent of formal work opportunities exist there (Symon, 1993).

The Move Towards Higher Residential Densities

Since the late 1980s the urban landscape in South Africa has been undergoing rapid transition. There has been growing recognition that the present typical South African city, which is characterised by low density sprawl, fragmentation and separation of land uses, races and income groups (Dewar, 1991), requires compaction. This compaction, which

Wills (1991, 2) says is a "conscious closing of the gaps created by decades of apartheid-inspired planning and urban management", aims to achieve a more efficient urban environment. The existing city structure generates enormous amount of movement at great cost; it creates a huge dependence on the motor car resulting in traffic jams and air pollution; it results in inefficient utilisation of existing bulk infrastructure; ineffective provision of services; decreased consumer thresholds and waists valuable agricultural land (De Loor, 1992; Dewar and Uytenbogaardt, 1991).

The repeal of the Pass Laws in 1986 contributed towards the increasing number of black people moving to the cities, as well as a high rate of natural population increase of the urban black population during the 1980s. People living in overcrowded conditions in the townships moved onto open land on the periphery of built-up areas (Crankshaw and Hart, 1990). Also, the city centres gradually became desegregated due to a surplus of accommodation in the inner cities as a result of the movement of many whites to the suburbs (Mandy, 1989; Zack, 1989). Much of the surplus accommodation was let out to blacks in defiance of the Group Areas Act, resulting in the breakdown of the low density, old white city (Lemon, 1991; Saff, 1994; Morris, 1994; Beavon, 1992). Housing in inner city areas, such as Hillbrow, became characterised by higher household occupancies to the extent of overcrowding.

With the abolition of the Racially Based Land Measures Act in 1991, a number of options have been promoted concerning urban development. McCarthy and Smit (1988) highlighted two broad spatial options for South African cities: The first is the neo-apartheid option which involves deconcentrated urban growth. The second option is that of compaction. The compaction option centres around densification and infill, as well as two other specific option: The first is the 'cities within cities' approach of Currie (1978) in which he views metropolitan areas as consisting of a "cluster of compact, walkable, planned communities of sufficient size to be true cities" (Currie, 1978, 182). The second options is Dewar's (1984) model of a compact city with 'mixed-use activity spines' which are surrounded by densely patterned residential areas, and which link higher and lower income areas. Dewar's model is generally seen to be applicable to the South African city as it is more realistic than Currie's model (McCarthy and Smit, 1988). Dewar's ideas have been used in Gauteng in a policy

document entitled "Interim Strategic Framework for the Central Witwatersrand" (CWCM, 1993), which promoted the idea of a compact city containing mixed-use activity spines.

Since 1991, the World Bank has influenced urban policy thinking in South Africa by focusing on economic efficiency. In their third visit to South Africa in 1993, the need to restructure South African cities to facilitate the location of low-income households closer to employment opportunities, emerged as a major planning issue. The World Bank, in conjunction with many other planners, focused on the compaction of the city as a means to economic efficiency. Both the World Bank and the Urban Foundation place emphasis on efficiency considerations. Robinson (1992, 300) views the Urban Foundation and the World Bank sceptically as a "modernist planning discourse" having a "fixation with economic growth". Both focus on the modernist idea "that planning and development should focus on large-scale, metropolitan-wide, technologically rational and efficient urban plans, backed by absolutely no-frills architecture" (Harvey, 1989, 66). Rogerson (1989a) notes his concerns in adopting World Bank thinking. He perceives that there is a danger that an emphasis on planning with market forces may absolve government of many of its responsibilities such as poverty alleviation. Swilling (1992) observes that if planning with market forces is emphasised, the compact city will never be achieved because the urban poor are likely to get pushed onto the periphery.

Contributions to the growing call for increases in residential densities and a move towards more compact cities, arise from diverse sources such as the World Bank (1993), the Urban Foundation (1990b), the Development Bank of Southern Africa, urban planners, academics, local authorities, political organisations and non-government organisations (De Loor, 1992; Symon, 1993; Vago, 1993; Taitz, 1993; Adler, 1993; du Plooy, 1993; Central Witwatersrand Metropolitan Chamber, 1993; African National Congress, 1994; Behrens and Watson, 1992, 1993; Dewar and Utenbogaardt, 1991). Many of these papers were presented at the 21st World Housing Congress in Cape Town in May 1993.

A number of key local publications since the election of the African National Congress (ANC) to power in April 1994, refer to the need for more compact cities, which shows that the move for more compact cities is no longer isolated, but is overt policy:

> "policies, administrative procedures and legislation should promote integrated land development in that they ...discourage the phenomenon of 'urban sprawl'; {and}... contribute to the land development of more compact cities" (Republic of South Africa, 1994a, 10).

> "location of residential and employment opportunities in close proximity to or integrated with each other ... contribute towards the development of more compact settlements, towns and cities" (Republic of South Africa, 1994a, 52).

Activities and Role Players in the Greater Johannesburg Area

The need for higher residential densities in Johannesburg has gained acceptance from planning and policy makers. One of the major role-players in the Witwatersrand area is Central Witwatersrand Metropolitan Chamber (CWMC). The Chamber aims to promote increases in population densities in areas where transport is good, employment opportunities exist and services are under-utilised; to promote the development of vacant and under-utilised land, as well as the renewal and upgrading of the inner city (Central Witwatersrand Metropolitan Chamber, 1993). Another role-player addressing the issue of densification in Johannesburg is the Central Johannesburg Partnership, which has formed a section 21 company called the Inner City Housing Upgrading Trust. The Johannesburg City Council has recognised the Inner City Belt (an east-west belt of land north of the M2 and Main Reef Road, surrounding the CBD) as an area holding much potential for densification due to its proximity to the CBD, accessibility to other places of work and the existence of physical and social infrastructure (Rosen, 1991; Zimmerman, 1990). According to Vago (1993) the Johannesburg inner city is the main commuter node for Gauteng which makes the inner city an attractive residential proposition. Vago (1993) notes that surveys amongst this commuter population indicate a need for good, affordable CBD accommodation in Johannesburg.

In Johannesburg, a project is currently underway by the Johannesburg City Council to release strategically located land parcels in the Jeppestown/Fairview/Troyeville area. The aim of this Jeppestown/Fairview/Troyeville project is to provide affordable housing for lower income

groups, and to test the feasibility of affordable, higher density housing development in the inner city (Symon, 1993).

It is evident that South Africa's urban system has been primarily influenced by the legacy of apartheid planning. With the move to urban reconstruction and development following the abolition of apartheid legislation, a new approach to urban management, which argues for compact growth, is needed. In developing a methodology for increasing residential densities, the legacy of apartheid planning needed to be understood, as well as the local factors affecting residential densities in cities.

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This chapter examined the ideological, historical, the physical and social factors that have influenced residential densities, internationally and in South Africa. It found that planners have not only sought to obtain optimum densities, but maximise quality of life. Howard, for example sought to solve the problem of high urban densities by advocating the decentralisation of people away from the crowded nineteenth century city. He also maintained that this would combine all the advantages of the town and the country. Le Corbusier, on the other hand, sought to obtain optimum densities and maximise quality of life by the sharing of buildings and grounds through the use of high density skyscrapers. Jane Jacob argued that higher densities in cities has benefits in that it provides the best living environment and the most economic opportunities. The literature also revealed that local conditions will also influence the densities at which planning takes place. Physical or topographical factors, such as the amount of land available for urban expansion, affect residential densities. Local social factors include life cycle, culture and preferences. Besides these factors, economic factors, such as the cost-effective provision of infrastructural services, has had a significant impact on residential densities, especially for the provision of housing to lower income groups.

A substantial amount of South African literature focuses on the historical development of apartheid planning and the resultant spatial structure of the typical South African city. Until

recently, few publications refer to the impact that apartheid planning had on density, and on the need for higher residential densities. Publications that do refer to the need for increased residential densities, seldom refer to *how* this could be achieved. The following chapter, which examines the implications of increasing residential densities and the ways in which residential densities can be increased, informs the development of such a model.

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