

A spatial analysis of gating in Bloemfontein, South Africa

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Abstract. Growing trends of fear and insecurity in cities have sparked the re-visitation of gating, posing significant problems for citizens and policy makers alike. Gated developments are a global phenomenon occurring in diverse countries in both the developed North and developing South. Metropolitan areas in South Africa have also witnessed a rapid increase in the number and spread of gated developments since the late 1980s. Development of enclosed neighbourhoods has become increasingly popular, gaining widespread support for their utopic lifestyle and safety features. On the whole, high levels of crime and fear of crime have led to the construction of defensible space, in the form of gated developments, resulting in elevated levels of segregation. This paper provides a spatial analysis on gated developments in the non-metropolitan setting of Bloemfontein. The pattern and timeframe of gating in this city is shown to be similar to those found elsewhere in South Africa and, indeed, globally. Overall, it is the contention that gating is a trend not only seen in large metropolitan areas, but across the entire urban hierarchy of South Africa, and, as a consequence, requires investigation far beyond its metropolitan regions to more fully understand gated developments.

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1. Introduction

Growing trends of fear and insecurity in cities have sparked the re-visitation of fortification, posing significant problems for citizens and policy makers alike (Lemanski, 2004). 'Gated developments' is a generic term for enclosed neighbourhoods, security villages, complexes, and lifestyle communities with additional or optional amenities such as schools, offices, shops, and golf courses (Landman, Schönteich, 2002). Gated developments are a global phenomenon, occurring in countries as diverse as Argentina, Brazil, Britain, Bulgaria, Canada, China, Philippines, Portugal, Spain, and the USA. In Africa, gated developments are found in Nigeria, Kenya, Zimbabwe, and South Africa (Landman, 2003). Metropolitan areas in South Africa have witnessed a rapid increase in number and spread spatially in gated developments since the late 1980s and early 1990s. Development of enclosed neighbourhoods has become increasingly popular, gaining widespread support for their utopic lifestyle and safety features (Landman, 2004). On the whole, high levels of crime and fear of crime have led to the construction of defensible space, namely gated developments, resulting in elevated levels of segregation which has resulted in elevated levels of class segregation (Landman, 2002; 2004; Spocter, 2004; 2013).

At the most general level the paper is located within a recent call to seek out and analyse geographies beyond the urban poor and the requirement for more intra- and inter urban diversity in the spatial locations of investigations (Visser, Rogerson, 2014; Visser, 2013). The paper is framed by the observation that with the exception of Goldhaber and Donaldson (2012), as well as Spocter (2013), the current South African gated developments discourse has for the most part mainly been concerned with the large metropolitan regions, with Gauteng a particularly strong locational focus (Landman, 2004; Breetzke et al., 2014). This investigation redirects the analytic gaze to a secondary city, and addresses an investigatory oversight in current knowledge pertaining to gated development in South Africa. Overall, it is the contention of this investigation that gating is a trend not only seen in large metropolitan areas, but across the entire urban hierarchy, including smaller cities.

In this paper, a detailed mapping analysis of gating in Bloemfontein, South Africa, is provided. The investigation is structured in four main sections of review and analysis. The first section furnishes a brief overview of current debates concerning gated developments. The second section introduces the study area and the methodology employed in this investigation. The third section provides a spatio-temporal analysis of gated developments in Bloemfontein since the inception of this phenomenon in the late 1970s. The final section provides suggestions concerning the further development of the gated development discourse in South African urban scholarship.

2. Defining the gate: some experiences

Physical features often create the prerequisites for the experience of social space (Landman, 2010). Sense of space is expressed by 'we' and 'they' attitudes on those inside and those outside, enforcing the identity of space (Bagaeen, Uduku, 2010). Social and cultural dynamics in gated developments are marked by minority groups, and oftentimes by the unique, elite enclave (Dear, Flusty, 1998). Globally, the wealthy are withdrawing their support from public spaces and, in effect, diverting their economic strength which heads to the creation of clustered wealth spots (Cséfalvay, Webster, 2010). However, gating is not only for the elite as increasingly the middle class is also seeking out housing in gated developments.

Gated developments, commonly known as gated communities, are premised on the fortification of space. Gated developments have been defined in various ways, with one common underlying thread: restriction to public access. The means of control ranges gates, booms, walls, and fences. Security measures include access control, guard houses, CCTV, and electric fencing, enhanced personal safety, and greater segregation (Atkinson, Blandy, 2005). Absolute definitions of gated developments pose significant problems. For example, should flats with access control, high-rising apartment blocks, and partially walled or detached houses with their own gates be included? Outward definitions will not suffice; the following inward char-

acteristics also need consideration: social and legal frameworks, contractual governance related to conduct, and contributions for maintenance. Defensible space features high in contemporary urban development (Bagaeen, Uduku, 2010). The increasing desire to exclude disadvantaged people has led to the creation of various forms of gatedness. Various urban exclusion designs exist, ranging from symbolic to concrete examples (Landman, 2010), such as private road obstruction, buffer zones and cul-de-sacs express exclusion to the public to some extent. The merits of defensible space are still debatable with questions about whether the pursuit of safer space not at the expense of the wider society (Blakely, 2007).

Blakely (2007) argues that gated developments are as old as community buildings. Archaeological evidence from settlements along the Nile River show fortified walls to keep scavenging hunters out. The early Mesopotamian regions were known for their walls, especially Greece. The initial masterminds behind personal enclaves were the Romans, where the wealthy built compounds to protect themselves from the dangers of the lower classes (Blakely, 2007). Historically, gated developments in England date back several centuries, whereas in the 19th century, Americans began developing privately owned luxury subdivisions for the rich as exclusive neighbourhoods separated from their surroundings.

Gating has in recent research been framed as an expression of the privatisation of public space, grounded in globalisation, neo-liberalisation, commercialisation, and more generally postmodern urbanism (Bagaeen, Uduku, 2010; Ramoroka, Tsheola, 2014). Research on gated developments covers nearly every continent (Bagaeen, 2003; Blandy, 2006; Caldeira, 2000; Glasze, 2006; McKenzie, 1994; Wu, Webber, 2004). Gating has been aligned with several essential elements in postmodern urbanism such as Holsteinisation, Keno capitalism, post-Fordism, post-industrial cities, and late capitalism (Nijman, 2000).

There is a range of impacts associated with gated development that ranges economic, environmental, spatial, socio-cultural, and transport variables (Bagaeen, Uduku, 2010). This investigation is concerned with only the spatial expression of gated development in Bloemfontein. The general con-

clusions drawn in the current gated development discourse is that: the developments are generally found in middle and upper-income areas of cities; they tend to be found in clusters; and very often are found at some distance from the historic CBD towards the periphery of the city and decentralised retail and business nodes.

In South Africa, the idea of gating has mainly been framed by the popular discourse of fear and a quest for privacy. However, addressing gated developments in South Africa requires additional contextual considerations owing to its long history of segregation (Bagaeen, Uduku, 2010). Examples for gating are the Castle in Cape Town in 1666, military forts in the 1700s, *laagers* (strongholds) in the interior during the 1800s and along with fortifications in the Eastern Cape. However, during the 20th century, a whole new level of spatial segregation was achieved through formulating new laws such as the infamous Group Areas Act of 1950. South Africa, known for its long history of racial discrimination and exclusion, culminated gated development ideology in a full-blown segregation plan known as Apartheid (Landman, 2010).

Although gating has, for the most part, been interpreted as a relatively recent urban process, Spocter (2004) has shown that in places such as Cape Town this practice can be traced to at least the mid-1970s. Nevertheless, the gating discourse has mainly been framed by the notion that the post-Apartheid era in South Africa presented a special relationship between modernism, colonialism, and Apartheid (Ramoroka, Tsheola, 2014). The end of Apartheid was seen as liberating, but also threatening, disempowering, and impoverishing. Thus, the condition of South Africa was pre-future, where uncertainty reigned in every aspect, waiting for the materialisation of an unknown future (Thornton, 2000). After the repeal of the Group Areas Act and election of the ANC government, South Africa underwent a profound transition from race-obsessed minority governed republic to an inclusive democracy. Post-apartheid South Africa has, in the view of Butler (2004), been characterised by increased urbanisation, a rise in unemployment, fewer formal job opportunities, high levels of crime and violence, as well as growing levels of fear of crime. This has, according to Thornton (2000), led to the creation of a multiplicity in boundary (re)definitions. The cre-

ation of gated places is seen as a mechanism to demarcate territories and define boundaries. On the whole, gated developments cluster residents together in a common geographical space to fight crime – a sense of a shared identity (community), which some argue does not in any way facilitate social cohesion, as has been assumed (Begaeen, Uduku, 2010) and poses significant undermining risks to governmental service delivery, with an increasing number of needs becoming privatised and self-maintained.

Gated developments, in fact, may give rise to the formation of a neo-Apartheid city in South Africa, which is based on three underlying factors (Ramoroka, Tsheola, 2014). Firstly, according to theory, the physically built environment conveys a particular message which is interpreted in different ways. This holds true for South Africa where gated developments are seen as an effective response to increasing crime, or as others view it, they pose significant consequences by focusing on their apparent impacts. The second factor is the sense of place, as physical space often creates the preconditions for social space. The construction of gated developments in South Africa gives occasion to the 'we' and 'they' attitude among those dwelling in gated developments. For the third factor, the sense of time, meaning is often attached to a particular place, for example a prison, church or a civic centre. Meanings change over time; while many today perceive gated developments as a form of former Apartheid, this may well be forgotten in the future (Landman, 2010).

This investigation is concerned with the spatial manifestation of gated developments. The research record suggests that, in both spatial and temporal terms, gated developments in South Africa have tended to echo international trends. The gated developments are in middle and upper income areas; they tend to cluster, and very often are located some distance from the former CBDs towards the periphery of the city. There have, however, also been gated developments forming in older established neighbourhoods, as seen in cities such as Cape Town, Johannesburg, and Pretoria. The ambition of this investigation is to assess these observations against the spatial backdrop of Bloemfontein - a city's which has not been viewed through the lens of gating as urban process in the academic press.

3. Bloemfontein as study area, and methodology

Historically, Bloemfontein has been highly segregated in terms of both class and race (Krige, 1991). Towards the end of the 19th century, legislation was introduced to separate different race groups (Rex, Visser, 2009). Such interventions were expanded over time. Between 1911 and 1950, Bloemfontein was characterised by two distinct processes of separation: firstly, an outward displacement of Waaihoek's residents toward the east of the railway line running from Johannesburg to Cape Town (serving as a buffer zone), which consisted of mostly Coloured people; and second, relocating the Coloured and African populations into separate residential areas: Heidedal for the Coloureds, and Batho for Africans, partitioned by the main road running from Bloemfontein to Dewetsdorp. The city of Bloemfontein exhibits distinctive living quarters according to a sectoral plan where each population group could spread outward in their subdivision. As a result, Bloemfontein served as a prime example of a model apartheid city of the past (Thornton, 2000) which were purposely divided into a white, western area and an eastern, African zone. Separation was reinforced by industrial areas, transport premises, and cemeteries. From 1950 onwards, planning was strategically aimed to enforce the Group Areas Act which led to the establishment of Botshabelo in 1979 (55 km east of Bloemfontein toward Maseru) for accommodating the African population and to resettling the se Sotho speakers in Thaba Nchu after Bophuthatswana gained independence (Rex, Visser, 2009). As illustrated, Bloemfontein has an extensive history of segregation, be it either racial or economic. Gated developments have become prominent since the 1990s, and are a transfigured continuum of Apartheid, where residents pursue safety and security obsessively.

The Bloemfontein area covers ± 330 km² and is home to $\pm 256,000$ residents, of which the majority reside in low-income township areas. The study area is subdivided into three areas of interest, the northern suburbs (affluent upper class), western and southern suburbs (middle-class areas), and the eastern outlying areas and southern townships (lower-class areas) (Fig. 1). Since the abolishment

of Apartheid the existing form of race division was mainly replaced by class division, which in essence regulates the spatial mobility of the poor (Rex, Visser, 2009). Table 1 provides some socio-economic insights into the study area's demographic, socio-economic characteristics of upper, middle, and lower class respectively, high stands out as the obvious 'more white' affluent area, ranking the highest in overall income levels. 'Middle' portrays the classic middle class areas where residents are largely employed, earning medium-level salaries and still has a predominantly 'white'

character. Finally, 'low' serves as a prime example of a low socio-economic profile, where the overwhelming majority are disadvantaged blacks with high unemployment and low income levels. Education levels prove similar in the high and middle classes, hosting a much larger educated population, in terms of tertiary education than the lower class area. As an undeniable distinction and aid in interpretation of the results, one cannot disregard the racial composition of the high and middle classes, which are predominantly white compared to the lower class area.

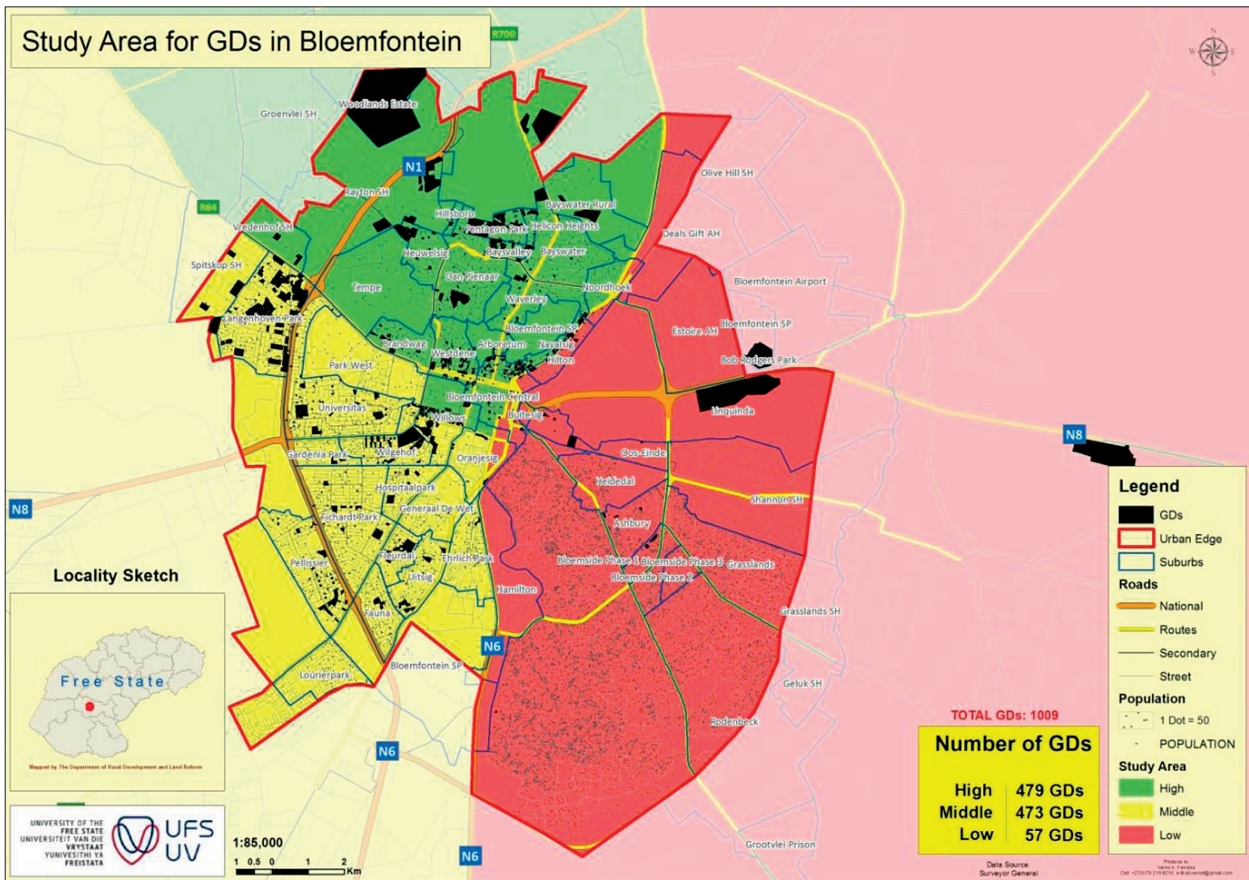


Fig. 1. Study area depicted with demarcated areas for high-, middle- and low-class areas

Source: Authors' survey

Table 1. General socio-economic data regarding the study area sub-divisions

	Area		
	High	Middle	Low
Number of residential properties	5,428	13,579	13,509
Average house price (R)	1,448.311	971.453	394.047
Racial composition (%)	Black = 28.5 Coloured = 3.6 Indian/Asian = 1.7 White = 65.2 Other = 0.9	Black = 26.3 Coloured = 4.3 Indian/Asian = 1 White = 67.9 Other = 0.5	Black = 87.9 Coloured = 5.4 Indian/Asian = 0.7 White = 5.6 Other = 0.4
Income levels (%)	<R6,400 = 37.3 R6,400–R25,600 = 42.2 >R25,600 = 19.5	<R6,400 = 45.8 R6,400–R25,600 = 43.2 >R25,600 = 10.9	<R6,400 = 86.8 R6,400–R25,600 = 11.6 >R25,600 = 1.6

Source: Authors' survey

To identify gated developments spatially, remote sensing was the obvious choice for the vast coverage of the study consisting of +330 km². Obtaining aerial photography for the Bloemfontein area can be tedious, especially obtaining up-to-date photographs. Selecting the right remote sensing source, primarily hinged on its spatial resolutions (1). Satellite imagery such as Landsat and SPOT were to be of no avail since its course resolution of 10-30 m was insufficient for identifying individual housing units. The fieldwork consisted of identifying these developments spatially and collecting information such as gated development name, security measures and housing types. Remote sensing data served as a general guideline to the whereabouts of these developments, and greatly improved the time necessary to locate each gated development and recording its name by georeferencing it accordingly. Gated developments were recorded with a handheld GPS which was then imported into GIS software for further analysis. In total, 1,009 gated developments were identified. Furthermore, having the gated development name was important since it serves as a unique identifier by which the questionnaire information could be georeferenced and analysed. The second part of the fieldwork was to divide the recorded gated development locations into sub-areas of interest for the purpose of improving the random sampling of questionnaires, and minimising uneven feedback.

The Mangaung municipality has sub-meter aerial photographs of Bloemfontein which date to 2011 and are updated every third year. Using these pho-

tographs, and by constructing a raster catalogue using ArcGIS software, a seamless backdrop is created, facilitating rapid identification of gated developments. These developments were identified according to the following criteria:

- Look for clusters of similar housing units.
- Housing units should display similar roofing style, shape, and colour.
- Locate the perimeter fence around the development.
- Locate the entrance (usually the driveway continues inside the development in a circular or semi-circular fashion).

Besides location, other features can also be identified from the aerials such as counting the number of units in the gated development, as well as finding the square coverage of the gated development. However, collecting data about the actual features, such as housing type, degree of security, and name of gated development could not be obtained remotely, and required further fieldwork.

Processing the data was roughly divided into two sections. The first was to take the georeferenced location nametags of the different gated developments obtained via fieldwork and convert them into XY coordinates which could then be mapped. However, extracting the data from the handheld GPS required additional formatting (a spreadsheet) for integration into the GIS package. After the data were projected, the coordinates were labelled and matched to their nearest parcel. Parcel data were obtained from the Surveyor General.

4. Spatial-temporal manifestation of gated development in Bloemfontein

Gating has increased dramatically since the 1990s in South Africa (Landman, 2004). This sudden influx of gating led to large-scale urban development in the form of clustered housing units (Van de Wetering, 2002). Bloemfontein is no exception; this is seen primarily in the rapid growth of gating since the 1980s and further steady accumulation in new developments annually. Figure 2 illustrates gated development applications since 1977. The sudden

downward trend (A) in applications in 1987–1989 was instigated by political change under the old Apartheid Regime (Swilling et al., 1991). The massive spurt (B) in applications from 1991 to 1994 was caused by an unprecedented crime wave and increased uncertainty (Blakely, 2007). From 1994 till 1999, there was a steep decline in applications owing to the global recession in the property market, where 1999 (C) indicates the lowest point. The millennial transition brought about an international housing bubble (D) of growth which collapsed during 2008 as the world hit yet another recession which continued until 2011 (E).

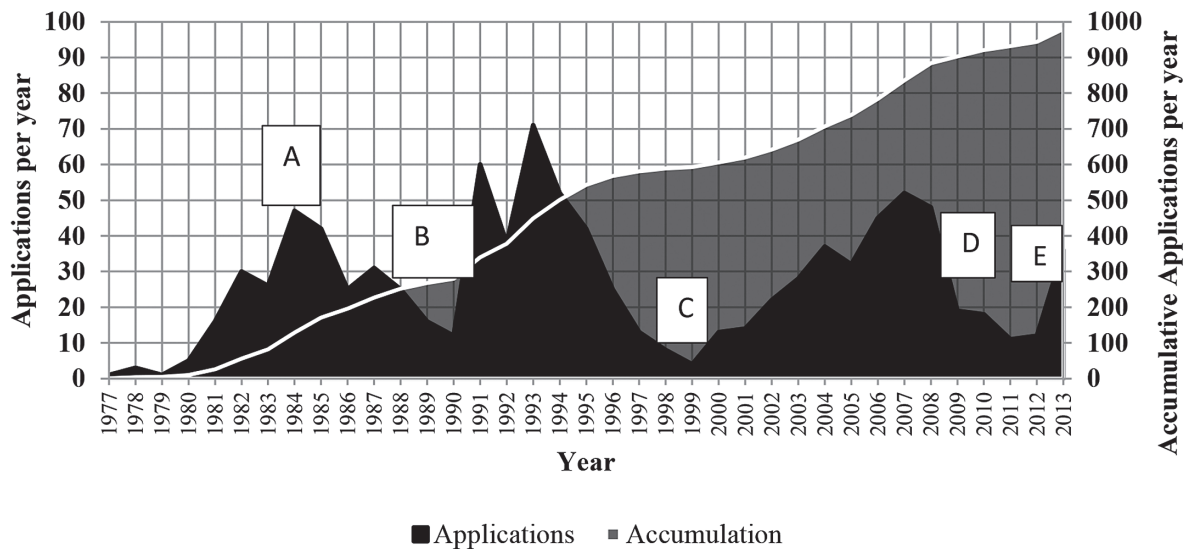


Fig. 2. Gating applications and accumulative number of gated developments

Source: Authors' survey

As illustrated, the number of applications per year went through highs and lows in a cyclical fashion. The spike of gated development applications is marked during the 1994 interval of democratic transition and growing insecurity for whites (Landman, 2003). Furthermore, the number of gated development applications is not declining as the trends show a steady rise in applications since 1973, as indicated in Figure 2. Next follows a spatial analysis of gating by identifying clusters, densities, and patterns of growth.

Looking at the gated phenomenon, one cannot define gated development without consulting its past development. This requires the number of gated developments to be indexed according to

the year of application, and mapped and displayed by year. Furthermore, Bloemfontein exhibits clear-cut signs of gated developments along predefined corridors of segregation. Compiling a sequence of maps from 1977 to 2013 provides insight into the rapid growth since the 1980s. As noted in the sequential illustration in Figure 3, the growth in gated development was initially established close to the CBD and developed outward especially during the 2000s. However, it also demonstrates that as Spocor (2004) has argued elsewhere, gating is an urban process in urban South Africa that has a long lineage. A comprehensive year-by-year time series mapping can be viewed online at <http://youtu.be/5CHYyYnrk1Q>.

The High and Middle income classes situated North and West of the central CBD indicated in green and yellow respectively were former white group areas. Thus, most of the gated developments before 1994 are found there. Rapid gating of Bloemfontein’s north western suburbs took place from 2000. The central areas around the CBD were among the first to densify through gating, as seen from the 1980s onwards. Relatively unprecedented

gating happened to the west of the N1 in Langenhovenpark, which is a predominantly white area to this day. The general trends for rapid gated development growth can be seen from 1984–1994, and from 2000 to the present day. By 2013, the number of gated developments had increased to 1 009 communities. In terms of density, all existing gated developments in Bloemfontein seem to have definite concentrations (2) (Fig. 4).

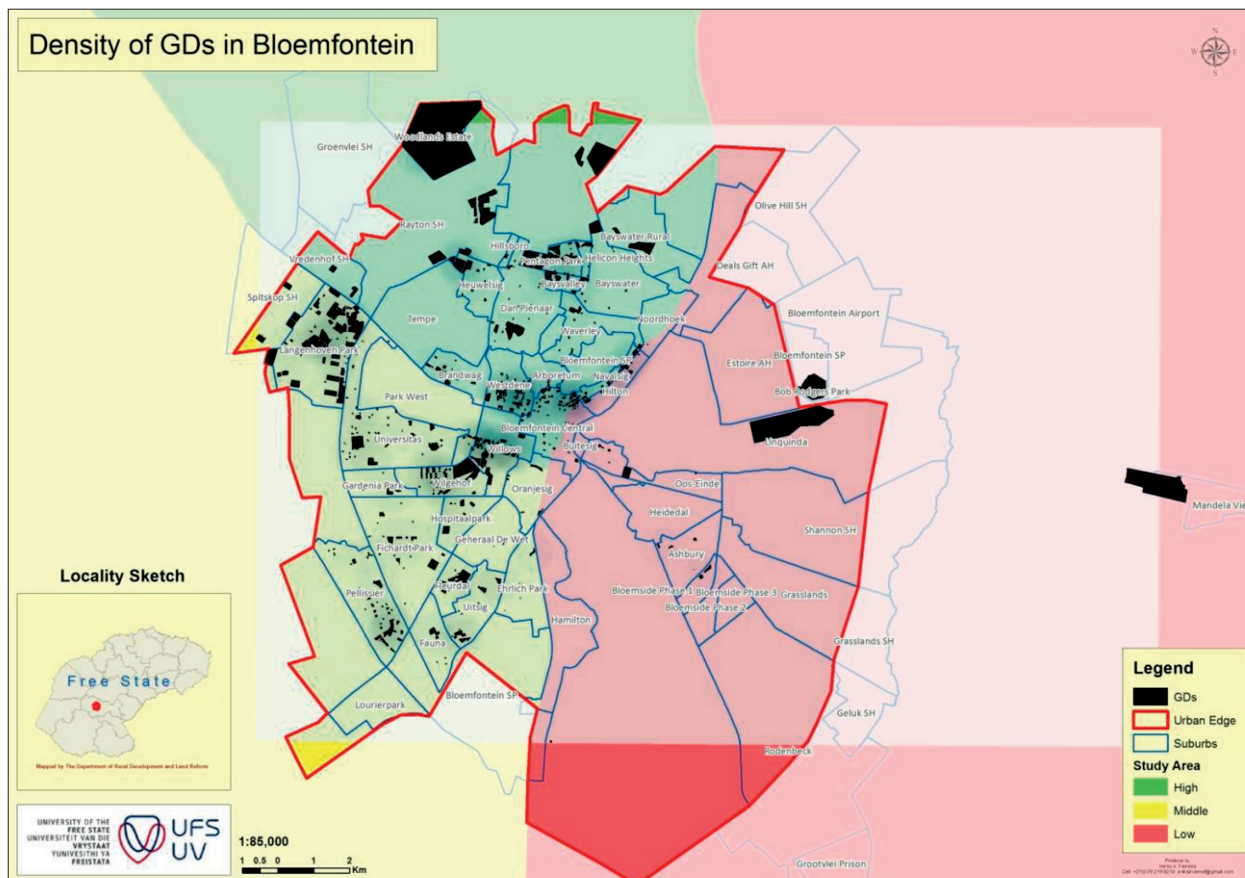


Fig. 3. Density of gated developments in Bloemfontein

Source: Authors’ survey

The dispersion of gated developments in Bloemfontein is found predominantly in high and middle income areas; however, as noted to the far east, newer developments have been established in quick succession along the N8 corridor and are identified as the next corridor for development in the Municipal Spatial Development Framework (Spatial Planning and Land Use Management Services – SPLUMS). Areas in the southern part of the high income areas, such as Westdene and Navelsig suburbs, exhibit high densities of gating. Langenhovenpark on the west of the CBD portrays a rapidly growing com-

munity with predominantly gated developments. The northern part, in areas such as Pentagon Park, Bayswater Rural and the North Ridge High, is one of the more recent additions to gated developments. Moving south in the middle income area, Uitsig, Fauna, and Pellisier have some locations of denser gated development clusters. Overall, the gated developments are relatively evenly dispersed across the middle and high income areas with a few exceptions in the older more established neighbourhoods, such as Fichartpark, Universitas, Hospitalpark, and Dan Pienaar.

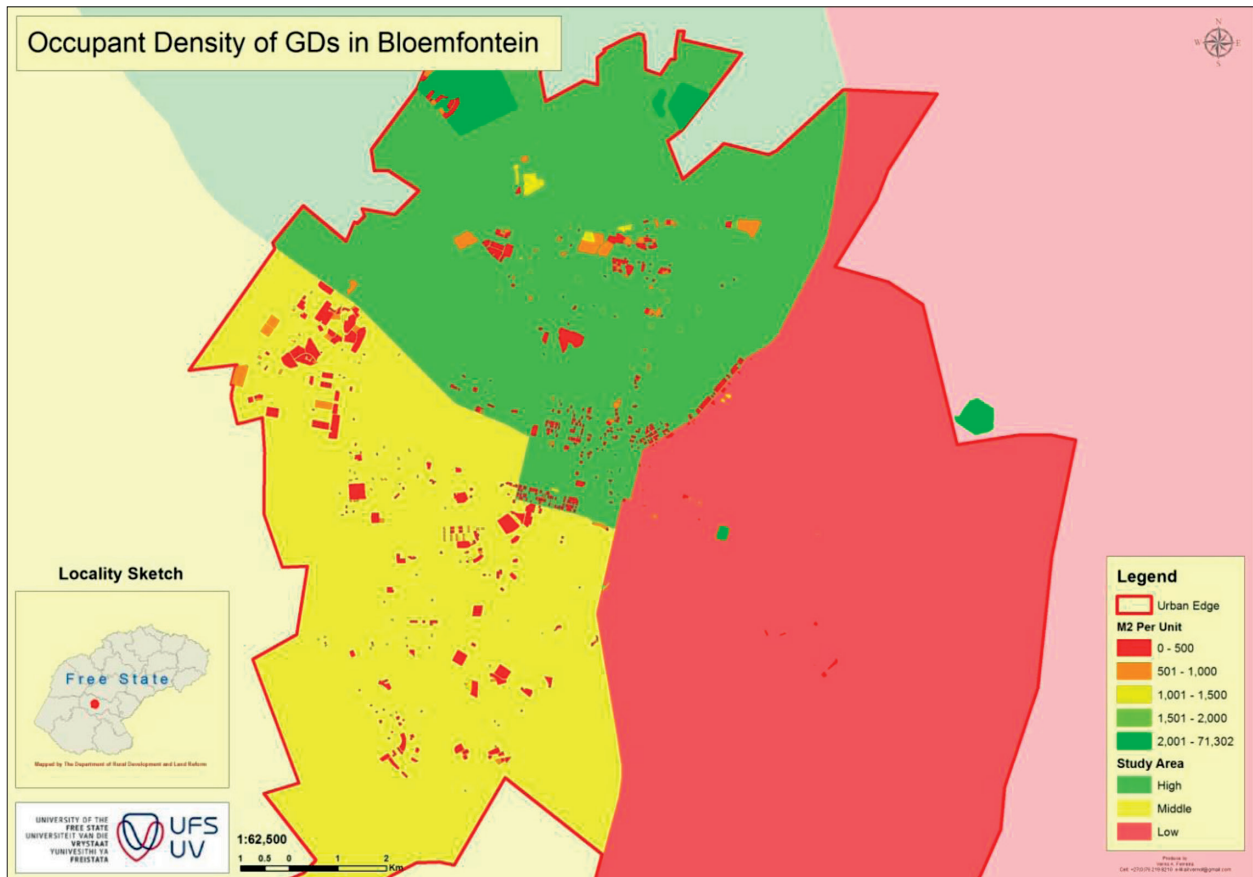


Fig. 4. Occupant density per gated development in Bloemfontein (by square metres per unit)

Source: Authors' survey

Turning to occupant density (3), it is notable that the gated developments situated closer to the centre have higher densities as compared to the more luxurious housing in the north. The majority of gated developments are below average density (those indicated in red and orange), which stands to reason since profit is the goal in these developments (Bagaen, Uduku, 2010). Few gated developments have large open space areas for their occupants. Only a few estates in the north, such as Woodland Hills, Oubos, and a few others, display such characteristics. In the main, gated developments are much denser than average single residential property stands in the city.

Figure 5 illustrates the spatial distribution (interpolation by year) of gated developments before the year 2000 (green) and after the year 2000 (red). One immediately notices the major green areas near the CBD as most of these gated developments are relatively older compared to the ones on the outskirts. Langenhovenpark also contains a green area noted

as the older part of the suburb. The red areas (after 2000) are situated predominantly outward around the high and middle income areas, which illustrates recent additions in gated developments. Another interesting fact is the red area down south which consists of Ehrlich Park and Hamilton (an upcoming black middle income area), as well as Linqinda where recent gated developments are taking place (Rex, Visser, 2009).

Performing a hotspot analysis according to the year of development indicates a strong correlation between higher income cohorts and gated developments (Landman, 2010). The significant area indicated in red portrays an area where most of the gated developments were constructed at roughly the same time as the darker yellow indicates. Compared to the southern suburbs, gated developments were not constructed during a specific period of development but more gradually. This further indicates that gated developments are preferred in the upper class areas.

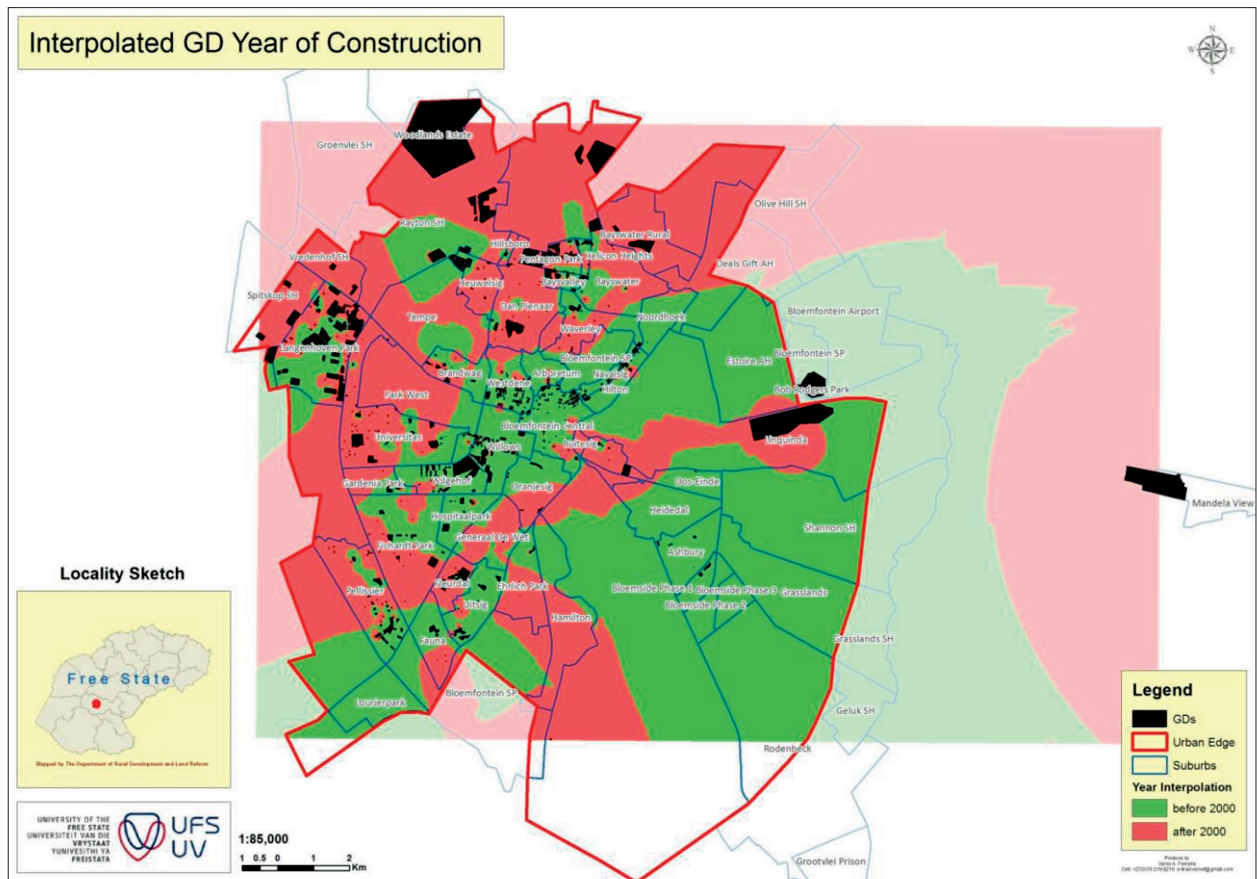


Fig. 5. Interpolated area of development before green (<2000) and red (≥2000)

Source: Authors' survey

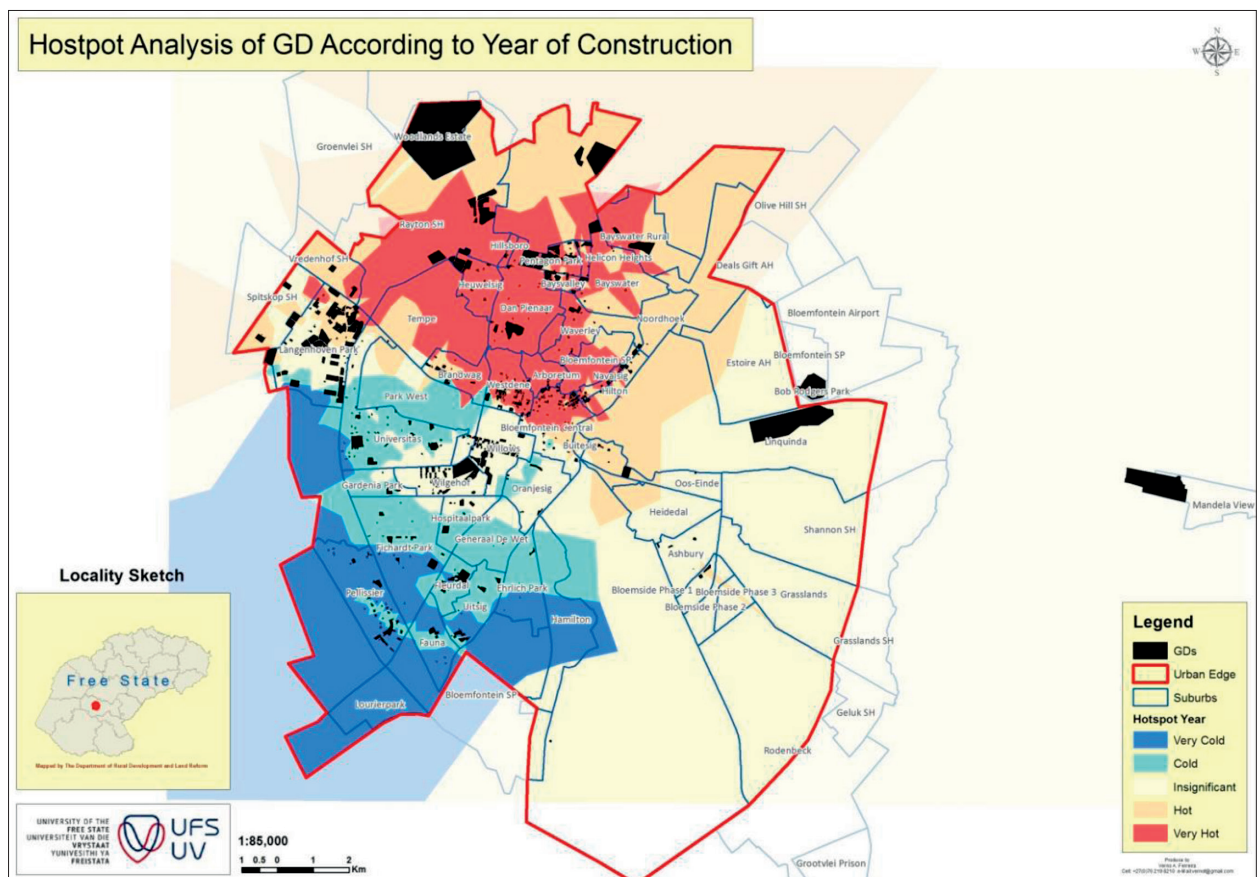


Fig. 6. Hotspot analysis of gated development construction periods (note the red cluster in the north)

Source: Authors' survey

Typical features of a post-modern city are the uncontainable urban sprawl away from the central business district (CBD). Fragmentation of the urban landscape occurs predominantly on the periphery of the city as edge developments (Dear, Flusty, 1998). Since the 2000s, signs of rapid expansion along Bloemfontein’s edges are well de-

finned (as illustrated in Fig. 8) gated developments and are predominantly situated further away from the CBD (Fig. 7). Those indicated in orange are upcoming developments (gated developments), which further proves how quickly edge developments have become the norm in an expanding urban landscape.

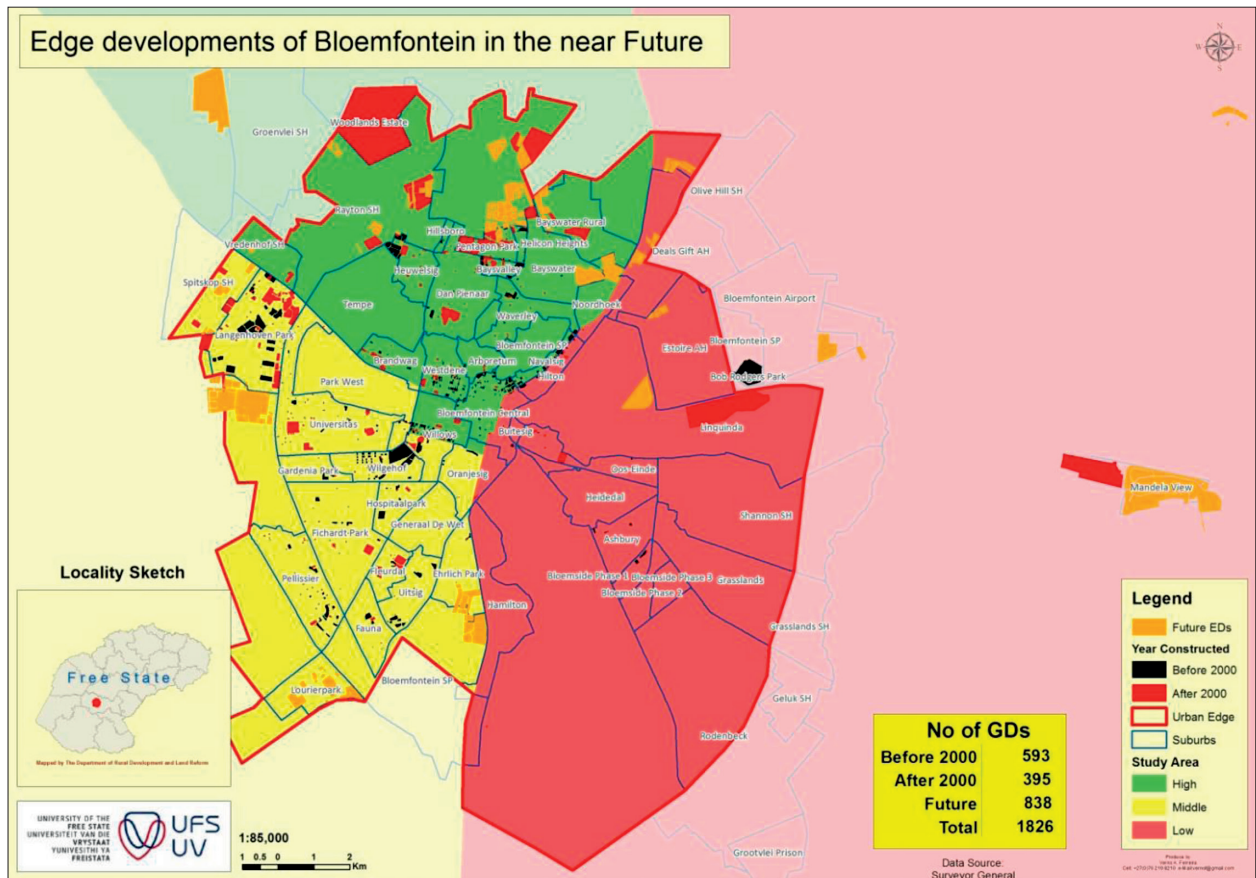


Fig. 7. Edge developments indicated in red with proposed gated developments in orange

Source: Authors’ survey

Dense concentrations of gated development in close proximity were identified. Figure 8 illustrates the marked clusters of gated developments regardless of their relevance to time. Moving sequentially through the identified clusters, Cluster A (Langenhovenpark) is essentially a gated development and less desegregated than any other suburb in Bloemfontein (Rex, Visser, 2009). It represents a neighbourhood that has undergone exceptionally far-reaching change to dense, gated clustered townhouse. This neighbourhood cluster is growing and currently stands at 141 gated developments. Cluster B, the older, more established gated develop-

ments, and initially focus on Westdene, exhibits the highest density, with 207 gated developments (see also Hoogendoorn, Visser, 2007 for expansion on neighbourhood change in this area). Owing to the lack of available spaces for new developments, further gated developments in this area are far less likely. The gate developments are also starting desegregated (Rex, Visser, 2009). Cluster C (Pentagon Park, North Ridge, Bayswater Rural) is a growing cluster (mostly expanding northward) and will in future become the largest, containing a typical upper middle income area poised on investing in their safety. Clusters D and E (Rayton and

Heuwelsig) are growing, where Cluster E (Rayton) is one of the newest developments for the upper class elite. What is interesting is as these neighbourhoods have changed not only in terms of increased densification and gating but has also seen considerable desegregation (Rex, Visser, 2009). Cluster F (Wilgehof and Willows) consists of the middle-income area as well as student housing. Living in these gated developments is not as expensive as the northern ones and gives their residents

close proximity to the CBD. A gradual shift is also marked from the old CBD toward suburbs situated westward such as Westdene (Hoogendoorn, Visser, 2007). New developments are steadily growing in this cluster of 156 gated developments. Clusters G, H, and I (Pellissier, Fauna, Uitsig and Fleurdal), which are lower middle income areas, contain pockets of gated developments that are essentially older ones and are also rapidly desegregating (Rex, Visser, 2009).

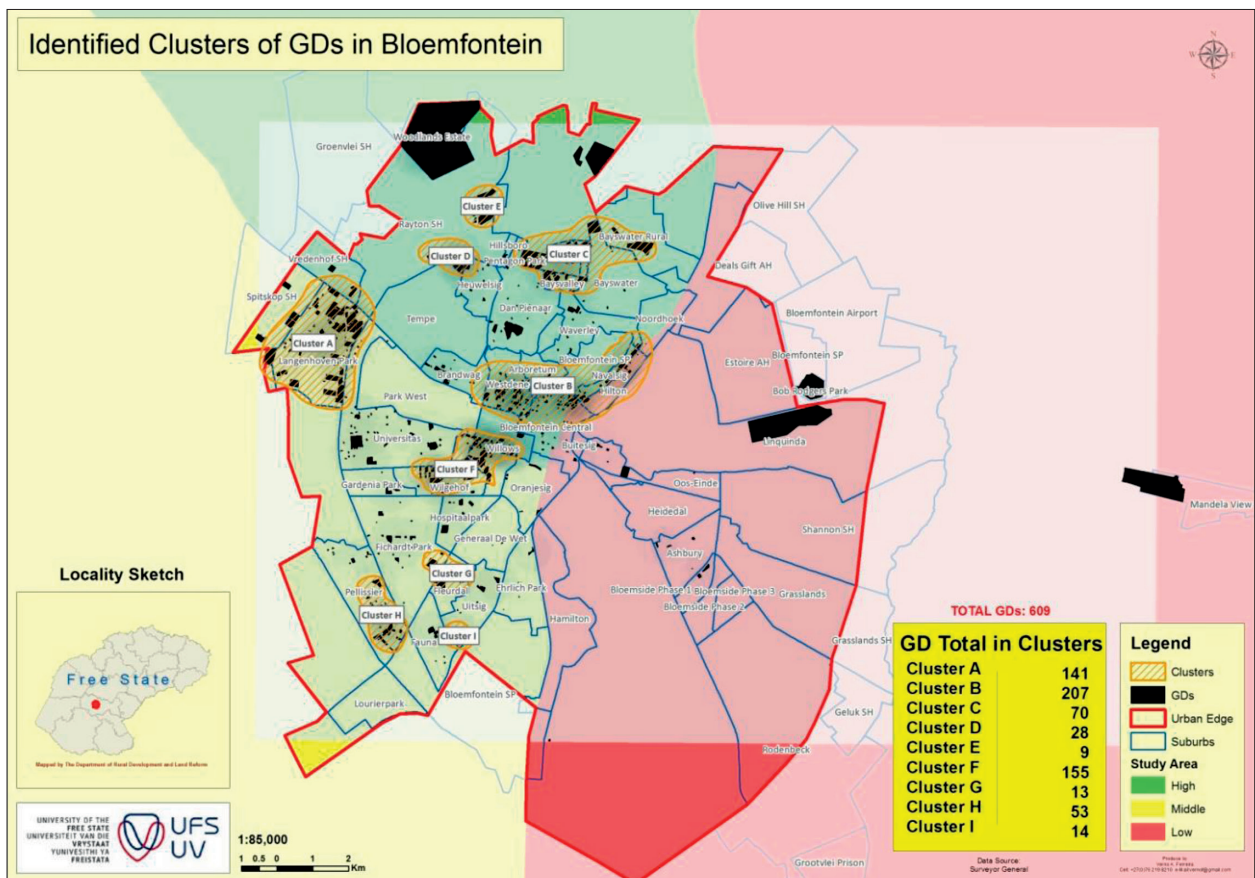


Fig. 8. Clusters of gated developments in Bloemfontein

Source: Authors' survey

5. Conclusion

The investigation has shown that gated developments are a highly visible and common form of residential housing provision in Bloemfontein. A key finding of this investigation is that gated developments in Bloemfontein are well established and significantly pre-date the collapse of apartheid spatial

planning. Gated developments are not only for upper income earners and include much of the middle class neighbourhoods of the city as well (Landman, 2004; 2010). In addition, gated developments are also starting to emerge in lower income areas. There is a rapid expansion of this form of residential provision, and it is taking place on the edges of the city, as seen in so many other postmodern urban contexts (cf. Dear, Flusty, 1998). On the whole, it would ap-

pear that nearly all middle and upper income residential housing provision in Bloemfontein is in the form of gated residential development. There is also evidence to suggest that in the older upper income areas, gated developments are taking shape in the form of densification of former large stands. In fact, the densification trend in some South African cities seemingly always results in the development of gated cluster housing with very high levels of fortification.

Gated developments are not only to be found in edge developments but also in places where older large properties are being densified in neighbourhoods that might be considered as central or in close proximity to CBDs. It would also be far off the mark to think that gated developments are only to be found in larger urban places. The proliferation of gated golf, wildlife, and eco-estates in South Africa demonstrates that gated developments are common even in remote, rural areas. In addition, it would appear that the bulk of middle class and upper income residential accommodation is now provided in gated development format. It is only the exceptionally wealthy, who can afford significant levels of fortification, that build stand-alone residences. South Africa's residential housing is increasingly a massive expanse of gated housing development with little or no direct or accessible linkages to either one another or other urban functions.

Notes

- (1) Square coverage per pixel unit on the photograph.
- (2) Areas of higher significance pertaining to the measured attribute.
- (3) Square metre living space per housing unit.

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