Midvaal Density Policy

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MIDVAAL DENSITY POLICY

1. INTRODUCTION

The Midvaal Local Municipality appointed Urban Dynamics Gauteng to prepare a Density Policy for Midvaal. The primary purpose of the Density Policy will be to provide a tool to manage spatial density within Midvaal to ensure that appropriate urban densities are achieved that adhere to sound planning principles and sustainable urban development.

Density is a quantitative measure of the intensity with which land is occupied by either development or population. The relative distribution of development and population has major implications for the provision of infrastructure and amenities, such as public transport, municipal services infrastructure and social facilities.

Densification in modern cities across the world is largely pursued to curb urban sprawl and this is largely done in order to protect environmental sensitive areas and high-potential agricultural soils, to enable the cost-effective provision of social amenities and municipal infrastructure, and to promote the efficient operation public transport systems. As such, densification is often directed towards areas that have sufficient infrastructure capacity, that have access to public transport networks, and have intrinsic characteristics that support higher densities, such as the characteristics that nodal areas have.

1.1 Aim of the Strategy

The purpose of the Midvaal Density Policy is to provide a strategy and a tool for urban densification in Midvaal, in accordance with the directives of national and provincial legislation. This policy will make proposals for the densification of specific locations within Midvaal that have specific characteristics and it will therefore aim to enable officials, planners, developers and the public to make informed decisions for densification such areas in the municipal area. In addition, this document will inform and be incorporated into the Midvaal SDF proposal to ensure alignment between this policy document and the Midvaal SDF.

As mentioned above, the Midvaal Density Policy will focus on location-specific densification in order to achieve a sustainable and efficient urban structure. This approach will produce density targets for individual and specific locations and it will sets minimum requirements for the densification of those locations. Thus, the homogenous densification of the municipal areas will not be encouraged through this process. Rather, the Density Policy will be applied with discretion and local knowledge at local level to achieve a diverse range of densification outcomes to ensure individual living environments that cater for a diverse range of people.
FIGURE 1: STUDY AREA LOCALITY
The management of the higher densities proposed by this Density Policy will be of critical importance. Good management of development densities will not only create a sustainable and efficient urban environment, but it will also enhance the living condition and costs of the local population, if dealt with correctly. It is therefore important that the Density Policy be a co-operative venture between the public and private sectors in order to encourage developers and land owners to utilise their properties to its maximum potential. This co-operation will largely be achieved through the public participation process that will run concurrently with the compilation of the Midvaal Density Policy.

### 1.2 Key Density Issues

Densification must be conducted in a manner that takes into account environmental, infrastructural and a number of other issues in order for it to be implemented properly and appropriately. Key issues that must be taken into account when preparing a Density Policy are as follows:

- Community resistance to higher density living
- Urban sprawl and the unsustainable cities it creates
- Environmental and agricultural resources and the effect of urban sprawl on these resources
- Social amenities need certain population thresholds, which can only be achieved through densification
- **Municipal services provision needs certain density thresholds and densification must therefore be linked to infrastructure planning**
- Densification requires the application of a wide range of housing and tenure options
- The efficient use of transport and specifically public transport requires support higher-density residential and business areas

### 1.3 Contextual Setting

Midvaal (often simply referred to as the Study Area) is a local municipal area within Gauteng and forms part of the Sedibeng District Municipal Area. As depicted on Figure 1, the Study Area is situated directly south of Johannesburg and southeast of Ekurhuleni. The northern parts of the Study Area are largely centred on the R59 freeway, linking Midvaal to Ekurhuleni and Johannesburg in the north and Vereeniging in the south. The primary urban conglomeration is centred on Meyerton, which abuts the R59 freeway. Vaal Marina is largely a vacation settlement situated on the Vaal Dam, which is located on the southern boundary of the Study Area.
2. NATIONAL AND PROVINCIAL LEGISLATION

The Density Policy must be informed by national, provincial and municipal legislation and policies, such as the Gauteng Spatial Development Framework.

2.1 Development Facilitation Act

The Development Facilitation Act of 1995 states that strategic policies that are drafted for municipal areas must promote efficient and integrated development and that, to this end, it must discourage urban sprawl in urban areas and contribute to the development of more compact towns and cities.

To curb urban sprawl and promote compact urban areas requires a number of actions. These may include promoting smaller stand sizes, encouraging a range of higher-density housing typologies, such as walk-ups, and promoting urban infill, where urban growth is encouraged to occur within the existing urban boundary.

2.2 Gauteng Planning and Development Act

The Gauteng Planning and Development Act of 2003 provides a number of principles to promote spatial development and restructuring. Included in these is the principle to encourage development that promotes more compact urban areas, the curbing of urban sprawl and the protection of high-potential agricultural land. In addition, the Gauteng Planning and Development Act encourages the development of land in a manner that optimises the use of existing resources, such as engineering services and social amenities.

2.3 Gauteng Spatial Development Framework

The Gauteng Spatial Development Framework identified five critical factors for sustainable urban development within the province. These are:

- Contained urban growth
- Resource-based economic development
- Re-direction of urban growth to economically viable areas
- Protection of rural areas and the enhancement of agricultural activities
- Increased access and mobility.

All of the critical factors mentioned above have to do with urban densification in some way or another. For example, redirecting urban growth to economically viable areas implies inward-directed development and therefore densification.
3. STATUS QUO

Density can be interpreted in a number of ways. It can either be interpreted as population density, which is generally expressed as the number of people living on a hectare of land. Or it can be interpreted as residential density, which is generally expressed as the number of residential dwelling units on a hectare of land. Or it can be expressed in terms of stand sizes. These density measures are applied to Midvaal to determine the general density patterns distinguishing the Study Area.

3.1 Population Density

Population density in Midvaal is depicted on Figure 2.

Most of Midvaal has a low population density of less than 1 person per hectare and this is mostly due to the fact that the Study Area is largely rural in nature. Most of the Study Area comprises large-cadastral farms housing only the farmer, farm workers and their families. Even the denser agricultural holdings found within the Study Area do not achieve densities higher than 1 person per hectare.

The areas with population densities higher than 1 person per hectare are mostly located along the R59 and to a lesser extent along the R82. Areas such as Henley-on-Klip, Riversdale and Rothdene achieve densities of between 2 and 5 persons per hectare. Lakeside and parts of Meyerton achieve densities in excess of 10 persons per hectare.

3.2 Residential Density

Residential density in Midvaal is depicted on Figure 3 and residential density in Meyerton, as a more detailed example, is depicted on Figure 4.

On the municipal scale, the Midvaal Study Area mostly comprises low residential densities associated with the farms and agricultural holdings found within the Study Area. The highest residential densities achieved by agricultural holdings are 1 dwelling unit per 4000m2.

When considering the R59 corridor in more detail, specifically the area surrounding Meyerton, higher residential densities become apparent. In this region, residential densities of between 1 dwelling unit per 2000m2 and 1 dwelling unit per 4000m2 are achieved. However, this residential density is low when compared with metropolitan areas such as Johannesburg and Ekurhuleni. The basic assumption can be made that, as Midvaal urbanizes over time, urban residential densities in key locations will have to be increased in order to achieve a more sustainable urban development pattern.
FIGURE 2: MIDVAAL POPULATION DENSITY
FIGURE 3
MIDVAAL RESIDENTIAL DENSITY
3.3 Stand Size

Stand sizes found within Midvaal is depicted on Figure 5 and stand sizes in Meyerton, as more detailed example, is depicted on Figure 6.

Geographically, most of Midvaal comprises farms and agricultural holdings and stands sizes are largely related to these spatial entities. Farms are typically 50000m² (5ha) or larger in size, whereas agricultural holdings are typically 10000m² (1ha) to 50000m² (5ha) in size. The agricultural holdings are largely situated in the north-western parts of the Study Area.

Smaller stand sizes occur in the proclaimed township areas abutting the R59, such as Meyerton. In these areas stand range between 700m² and 4000m² in size. However, stands located within areas such as Meyerton and Henley-on-Klip are quite large when compared to similar areas situated in metropolitan areas, such and Johannesburg and Ekurhuleni.

4. THEORETICAL PARAMETERS

The densification of the Midvaal municipal area is bound by a number of parameters. These parameters guide and influence urban development in general and the densification of the municipal area in particular.

4.1 Sustainable Neighbourhoods

Sustainable urban development needs to be a primary goal when developing urban areas. The Municipality and the community at large need to share a common goal to create more sustainable urban areas within Midvaal, which:

- Prioritise walking and public transport and minimises the need to use private vehicles
- Deliver a quality of life and provide access to economic opportunities
- Provide a range of social amenities that are easily accessible
- Present an attractive and quality public realm that is easily maintained
- Promote the efficient use of land and energy
- Provide a mix of land uses to minimise transport and travel distances
- Promote social integration and provide accommodation for a diverse range of household types
- Enhance and protect the natural environment and biodiversity

Underlying the principles of sustainable development set out above has, in some way or another, to do with density and the densification of urban areas. In other words, urban density needs to be applied in a manner that will enable the creation of sustainable urban environments.
To date, a largely low-density environment has been developed within Midvaal. Such an environment encourages urban sprawl over large areas, which forces the households living within such an environment to own a private vehicle to access community facilities, shopping destinations and employment opportunities. Consequently, the low-density areas are not suited for pedestrians and the operation of public transportation.

There is general agreement in literature what constitutes a sustainable urban environment or neighbourhood that effectively applies density to achieve sustainability. Such a neighbourhood is limited in area and is structured around a defined centre or node. The node is the higher-density part of the neighbourhood and it is the focus of the neighbourhood’s public buildings, such as a post office, a community hall and a library, shops and workplaces. The density of the neighbourhood decrease with increasing distance from the nodal core of the neighbourhood. The outer edge of the neighbourhood may be assigned to very low-density residential use, such as golf estates, it can be designated for rural purposes, such as agricultural holdings, or it can be set aside for the conservation of ecological sensitive areas. A 20 minute walk or 2km drive delineates the outer ring of the neighbourhood.

### 4.2 Land Use and Transportation Integration

Land use and transportation integration forms the backbone of an efficient urban structure. It not only ensures the cost-effective operation of a city’s public transportation system, but it also tends to limit urban sprawl by
concentrating urban development at higher densities close to major transportation routes.

The key to successful land use and transportation integration is obtaining higher land use densities at major intersections and public transit stations, such as bus stations, taxi ranks and commuter railway station. These are the points where access is obtained to the public transport systems and attempts should thus be made to optimally use these strategic locations.

The integration of higher-density housing development and public transportation is of critical importance. On the one hand, higher-density housing units provide the necessary commuter thresholds to support public transport and, on the other hand, households that live in higher densities are typically more reliant upon affordable and efficient public transport to access employment opportunities.

Housing densities exceeding 20 units per hectare should be encouraged at major transport intersections, with higher densities encouraged close to transit stations, such as bus stations, taxi ranks and commuter railway station. This will necessitate developing housing typologies that defer from conventional single dwelling units, towards higher-density housing typologies.

### 4.3 Urban Development Boundary

The Urban Development Boundaries (UDB) is a mechanism to contain urban sprawl and to define a line beyond which only limited municipal services are provided. An UDB also plays an important role in the protection of environmental areas and high-potential agricultural soils. Thus, an Urban Development Boundary to assist in controlling unsustainable urban growth and settlement development. In general, an Urban Development Boundary:

- Limits an urban area’s footprint and urban sprawl to prevent the excessive consumption of land
- Focuses on in-fill development and the redevelopment of brownfield areas
- Supports cost efficient infrastructure provision
- Encourages an urban form that supports the efficient use of public transport
- Protects environmentally sensitive areas
- Provides strategic direction in terms of capital investment, specifically investment in municipal infrastructure

An Urban Development Boundary needs to be used with other development strategies to ensure the densification in specific urban locations. Strategies might include promoting mixed-use developments to ensure better land use concentration, the improvement of infrastructure provision and the provision of public transport.

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An Urban Development Boundary does not necessarily prohibit development outside the demarcated boundary, but it does prohibit intensive, high-density development, which is more suited for urban environments, outside the boundary. As such, the demarcation of an Urban Development Boundary must be done with urban density in mind. The Urban Development Boundary must enable the densification of strategic areas, such as areas that are located in close proximity to bulk infrastructure and social amenities. In turn, these higher densities will reduce the pressure for development on areas located beyond the Urban Development Boundary.

4.4 Infrastructure Services

Infrastructure availability or potential availability is a pre-requisite for densification. However, existing infrastructure alone should not dictate future areas for densification. The location criteria for densification, such as proximity to nodal areas, should also be used to determine appropriate locations for future densification and infrastructure provision. If a criteria-based approach is taken, infrastructure provision should follow densification and strategic investment in infrastructure should occur accordingly.

It is imperative that bulk services contributions be maintained at a level that effectively contributes to the upgrading of bulk infrastructure in order to increase densities in strategic locations. This may result in higher bulk services contributions to fund infrastructure provision in certain localities that support urban densification.

4.5 Protection of Agricultural Land

Large parts of Midvaal comprise high-potential agricultural land, implying that many parts of Midvaal are not suitable for urban development from an agricultural point of view. In selected cases, the development of moderate-potential agriculture areas could be considered for urban development. This is especially relevant in areas where higher urban densities are required. For example, areas abutting public transportation spines or stations are often more suitable for higher-density development than for agricultural development. Developing such areas at higher densities will limit urban sprawl and lessen the pressure for urban development on peripheral, high-potential agricultural areas.

5. HOUSING AND DENSITY

A critical factor in developing cities into sustainable urban environments is the use of higher urban densities than in the past. Higher housing densities in particular can contribute to more sustainable urban environments. Higher densities are important for several reasons:
• Higher densities lead to a significant saving in land cost per unit, as less land is needed and land is used more efficiently.
• One of the main arguments for encouraging higher densities is the efficient provision of infrastructure. Low urban densities translate into long infrastructure runs and therefore higher cost per consumer for the installation, operation and maintenance of infrastructure.
• Efficient public transport requires medium to high densities to be able to provide frequent and efficient public transport services. Low densities with long walking distances cannot support efficient public transport services.
• Community facilities, such as schools and health clinics, are difficult to reach for many people at lower densities.

Housing typologies are a critical factor influencing urban density, simply because certain housing typologies accommodate more units per hectare than other typologies. Housing types can be categorised according to level of attachment, which is closely related to the housing density that can be achieved. Level of attachment refers to the vertical and horizontal attachment of buildings. There is a tendency, when addressing housing demand, to provide freestanding units with little or no level of attachment. There is little exploration of the densification benefits of attached housing typologies, such walk-ups, row housing and semi-detached units.

<table>
<thead>
<tr>
<th>Housing Typology</th>
<th>Net Density</th>
<th>Building Height</th>
<th>Tenure Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster housing</td>
<td>25 u/ha</td>
<td>1 storey</td>
<td>Full title or sectional title</td>
</tr>
<tr>
<td>Duplex housing</td>
<td>60 u/ha</td>
<td>1-2 storey</td>
<td>Full title or sectional title</td>
</tr>
<tr>
<td>Walk-ups</td>
<td>80 u/ha</td>
<td>3 storey</td>
<td>Rental or sectional title</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2011

The following discussion on typologies is not exhaustive, but rather focuses on housing types that achieve higher urban densities. The Table above provides an easy-reference summary of the attributes of the different housing typologies and how it compares with the attributes of other housing typologies.

a. Cluster housing
Cluster housing developments are characterized by housing units located within a housing complex, which shares communal facilities and a perimeter security wall. These housing units can either be detached or attached to one another, thus sharing at least one wall of the unit. This housing type does not exclude a second and third storey. Ground access, a private garden and on-site parking is possible with the housing typology.

Cluster houses are usually located on stands of a relatively small size. These smaller stand sizes are often achieved through the use of shared walls. Cluster housing yields a nett density of approximately 25u/ha. The smaller stand sizes translate to substantial infrastructure cost savings, making cluster housing more cost-effective than detached housing units. Shared walls also reduce the construction costs of the buildings, compared to detached housing units.

The smaller stand sizes and higher densities achieved by this housing typology, compared to that of detached housing units, make it more suitable as a public transport related development. Although it does not create the desired densities that would significantly boost public transport patronage, it is a better option than detached units. In a sense, this housing typology creates a balance between creating a detached housing unit layout and achieving higher densities that are more transport related. This housing typology is best located along public transport routes.

b. Duplex housing

Duplex housing comprises more than 2 housing units linked to one another, as opposed to cluster housing that can either be detached or semi-detached housing units. Duplex housing units can be attached horizontally and vertically and the number of units to be attached is not limited to a specific number. Usually, 4 attached units create a well-scaled building. Such a building configuration, combined with shared walls, reduces the construction costs of these units. It also allows relatively small stand sizes and this makes substantial infrastructure cost savings possible. Ground level units can have a private garden. On-site parking is possible.

Duplex housing can either be full title (individually registered stands) or sectional title. Duplex housing can only be sectional title if there is a vertical separation of units. The small stand sizes of duplex housing yield a nett density of up to 60u/ha. This density is the minimum density
required to ensure the optimal operation of public transportation systems. Developing such housing types within walking distance of public transport stations would thus better serve public transport than lower density housing options, in particular commuter rail.

c. Walk-ups

Walk-ups provide a low-rise, higher-density housing option. It is only this level of density that really becomes beneficial for public transportation and the cost-effective operation of public transport. With nett densities of approximately 80u/ha, this housing typology places enough commuters within walking distance of a public transportation station to ensure the viable operation of a public transportation system. Also, residents living in walk-up apartments are usually of a household income bracket that uses public transport as their means of transport, which implies a mutually beneficial relationship between walk-up housing typologies and public transport.

This housing type involves individual housing units stacked on top of each other up to 3 storeys high. This housing configuration is located on a single stand, thus only making full title ownership is not possible. Walk-up units are either sold off as sectional title units or applied as rental units. What distinguishes walk-up from flats is the fact that walk-up units are accessed via a staircase, whereas lifts are mandatory in flats. The gardens surrounding the building are in communal ownership and use. On-site parking is possible in the form of a parking lot and garages.

Usually, this housing typology is cheaper to build than flats, because it does not require costly lifts and construction methods. In addition, the higher densities obtained makes substantial savings in infrastructure costs possible. This cost saving not only applies to municipal infrastructure (water, sanitation and electricity), but also to the provision of roads infrastructure.

6. DIRECTIVES

Urban density is a quantitative measure of the intensity with which land is occupied by either development or population. Control of density is a fundamental component of effective land use planning, because the distribution of development and population has major implications for the provision of public infrastructure, such as transport, municipal services and
social amenities. The lack of density in our cities has led to certain implications for the way in which our cities function. These consequences can are as follows:

- Settlement patterns are distorted with residents often having to travel the long distances to access economic and social opportunities
- Our cities are costly, because the long travel distances result in high costs in terms of time, energy and pollution spent
- Provision of efficient and viable public transportation is almost impossible due to low residential densities and the dispersed location of economic activities
- Installation and maintenance of municipal services infrastructure is costly, which impacts on the affordability of the services provided
- Large tracts of land with agricultural potential is being destroyed due to urban sprawl, which is a result of the low urban densities

Based on the aforementioned as a point of departure, the following issues need to be addressed in the density policy:

- To ensure quality living environments for all residents
- To ensure an appropriate balance between the residential density of an area and the capacity of the municipal services infrastructure to service this residential population
- To align densification to areas where adequate social infrastructure is available
- To maintain an efficient intensity of land use on a limited supply of developable land
- To provide a variety in urban form and urban design and to satisfy the demands of different residential and business market sectors
- To ensure development is of an appropriate scale that relates to its landscape setting
- To create clear guidelines for higher density residential developments
- To introduce suitable housing options and typologies that support higher densities
- To reduce pressure on conservation-worthy environmental areas
- To place residential densification in close proximity to economic and employment opportunities
- To ensure effective and appropriate decision making in terms of density proposals

### 6.1 Densification Objectives

Promoting higher urban densities primarily aims to restructure the urban environment in such a way that it becomes more efficient, more equitable and more convenient for its residents to live in. This is not to say it aims to create uniform, high-density areas. Most cities are not uniform areas, but rather consist of areas of concentration and areas of dispersion. However, cities often tend to favour dispersed development, and it is therefore necessary to enhance the areas of concentration in order to correct the
density imbalance within cities. Based on the aforementioned, the objectives of urban densification in Midvaal should be:

a. Minimise the footprint of the urban area

Urban development often transforms greenfield areas into built-up areas, thus destroying the natural environment. This in itself warrants a concerted effort to limit the impact of urban development on such areas by limiting urban sprawl through urban densification. In essence, land should be seen as a scarce and limited resource (even in an area such as Midvaal, which has large land parcels) and should be used in a manner which reflects the scarcity of land as a resource.

b. Prevent the destruction of agricultural land

Urban sprawl often destroys high-potential agricultural land located in close proximity to urban markets. In many developing countries this also significantly impacts on agricultural employment and food security. This high-potential agricultural resource has to be protected from urban sprawl through urban densification.

c. Improve the use of public transport

One of the primary ways of improving the use of public transport is by increasing residential densities in nodal areas and along public transport corridors. Inevitably, this has major implications for the way in which urban areas are developed.

d. Improve the efficiency of urban areas

A more compact urban area generally increases accessibility for local residents and reduces infrastructure development and maintenance costs for local government.

e. Reducing Inequality

Greater density in urban areas ensures greater access to employment opportunities and social amenities, especially for lower-income groups. A fragmented and low-density urban environment usually does not achieve this.

f. Create structural identity

Densification should take place in a focussed manner, which can assist in transforming monotonous urban area into areas with an identifiable spatial logic and identity.

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g. Ensure choice in housing options

A balanced and diverse range of housing options, densities and typologies usually serves the needs and income abilities of all the residents of an urban area.

h. Accommodate diversity

Planning the densification of an urban area needs to recognise a multiplicity of users. A standardised, one-size fits-all approach to densification in different parts of an urban area usually does not accommodate diversity in an urban area.

i. Ensure high quality environments

Densification should bring about a positive change in the liveability of urban environments. Compact, well-planned cities tend to be more liveable than low-density sprawling cities. Aspects such as overcrowding, which can be the result of densification, can and should be prevented.

j. Provide social amenities

It is imperative that, through the process of densification, the need and provision of social amenities be addressed. Higher quality living environments cannot be achieved if higher densities are encouraged without adequately providing for basic social needs.

k. Protect environmentally sensitive areas

Environmentally sensitive areas need to be protected by limiting urban encroachment through densification. Environmentally sensitive areas should be treated as a resource which cannot easily be rehabilitated once it has been damaged. Strategic densification can effectively be used as a method of releasing pressure on environmentally sensitive areas.

l. Promote public transportation

An urban form that is designed around private vehicle usage, with limited public transport opportunities, needs to be remedied using densification. Public transport investment can only occur once commuter thresholds are achieved through densification. Densification should ideally occur around public transport stations and transport interchanges.

m. Protect low density areas

Not all areas are conducive to higher urban density due to the character and nature certain neighbourhoods, environmental considerations, geotechnical considerations and infrastructure issues.
In addition, certain areas should be preserved and protected for varying life styles. For example, lower density residential areas with larger stands are usually the choice location for families with young children. Such issues should also be considered when densifying an urban area.

n. Promote sustainability

In general, densification needs to be planned and implemented in such a manner that ensures that higher density developments are sustainable, that the natural environment is sustainable, that projects are financial sustainable, and that social amenities and municipal service infrastructure can be maintained and used sustainably.

### 6.2 Densification Principles

There are a number of general densification principles which need to be considered when planning for land use, public transport or municipal services infrastructure. Development densities can effectively be used to achieve an efficient urban environment that provides the necessary population thresholds to support social amenities, public transport and municipal services infrastructure, while meeting environmental objectives, such a limiting urban sprawl. The general densification principles are:

- There should be a hierarchy of residential densities to meet the need for a diversity of housing typologies
- Densities should be in line with what the existing and planned municipal services infrastructure capacities can cope with
- Investment in infrastructure, open spaces and social facilities should ideally precede higher density developments
- Higher density developments should be located near rail stations and major public transport interchanges, social amenities and nodal areas
- There should be a decreasing gradation of development densities from density focal points, to enable density interface with lower density areas
- Careful consideration should be given to environmental planning to make sure environmental objectives are met when densifying an urban area
- Retain open space and critical environmental areas near higher-density areas
- To avoid monotonous urban form and to achieve a more interesting urban environment, developments at different densities should be considered
- A low residential density in close proximity to environmentally sensitive areas would be more compatible and will help avoid human disturbance impact on these areas as far as possible
- Densification must contribute to the overall structure and functionality of an urban area in that it takes place in a focussed and structured manner
- Densification should be concentrated around specific areas, such as nodal areas and transit stations.
- Densities should be linked to the characteristics of a particular part or neighbourhood within an urban area.
- Densification must be applied in such a way that the unique spatial characteristics of an urban area is maintained.
- Areas in need of restructuring can be identified as densification areas.
- Areas earmarked for densification must possess existing and future growth potential.
- Development should be promoted within the existing built-up area or Urban Development Boundary in order to limit urban sprawl into Greenfield areas.
- Densification should take into account its impact on surrounding environments.
- An indiscriminate application of densification should be avoided in order to retain quality urban environments.
- High-density developments should promote safety and security by creating defensible spaces.
- Promote walking as a primary form of movement in densification areas.
- Densification areas should be well served by public transport or have the possibility to be well served by public transport in future.

7. UNDERSTANDING DENSITY

Before proceeding with proposals for the implementation of densities within Midvaal, it is necessary to briefly consider density and what it does and does not imply practically.

7.1 Density Misconceptions

As was mentioned, a critical element in developing more sustainable urban areas is applying higher development densities than in the past. This has been necessitated by the past inefficiency and high costs of existing spatial patterns. However, density is often a controversial topic and is often misunderstood, which often hamper to application of higher densities. Some misconceptions regarding densities are:

- Firstly, it is often taken that low densities create high quality environments and high densities create low quality environments. However, high quality environments can be created at both low and high densities and depend more on design considerations than density. Instead, poor living conditions are more a cause of other factors, such as poor architectural design, a lack of infrastructure and public services, scarcity of open space, poor environmental conditions and poverty.
- Secondly, there is a misconception that only one housing type can be created at a certain density. In fact, a wide range of housing types can be provided at most densities, except at the lowest end of the
density scale. For example, studies have shown that similar densities can be achieved by four storey buildings than can be achieved by high rise buildings for various technical reasons. Thus, a high-density environment does not necessarily mean a high rise environment.

- Thirdly, the misconception exists that high densities are appropriate for low-income groups and low densities are only appropriate for high-income groups, because of the cost implications. Internationally, numerous examples exist where varying densities have been applied successfully to all income groups.

- Fourthly, the misconception may exist that higher densities are inappropriate in a rural environment, such as Midvaal. On the contrary, higher densities are just as appropriate in rural areas as they are in urban area. Allowing excessively low densities in rural areas often allow relatively low residential population numbers to sprawl over large commercial agricultural areas, as is also often the case in the peripheral areas of larger urban areas. Also, low densities incur high municipal infrastructure costs, whether in urban or rural areas.

### 7.2 Density Terminology

In general, the methods for controlling density fall into two principal categories: Floor Area Ratio (FAR) and dwellings per hectare (u/ha). Densities are expressed in terms of Floor Area Ratio, height and coverage for the business and mixed-use areas and dwelling units per hectare for residential areas. The zoning terminology used in this regard is defined below. However, the definitions below only for explanatory reason in this policy document and do not replace or substitute the definitions presented in the application Town Planning Scheme.

a. Building Height

The height of a building can either be measured as the height of the roof of the building or as the number of storeys of the building. In this document, the number of storeys is used as the measurement of building height. A storey is that part of a building between the surface of one floor and the ceiling immediately above.

b. Coverage

Coverage means the area of a property which may be covered by a building, as seen vertically from the air, excluding roof overhangs. It is expressed as a percentage of the area of the property.

c. Floor Area

The floor area of a building is the sum of the area of each floor of the building, excluding fire escapes, parking space, access passages, lift housing, and balconies.
d. Floor Area Ratio (FAR)

FAR is a density measure that is applied to mixed-use buildings that contain both residential and other uses. The floor area ratio (FAR) is the ratio of total building floor area to the area of the property. FAR is calculated by dividing the floor area of the building by the total area of the property.

e. Residential Density

Density refers to the intensity of development within a zoning district. In residential areas, density is generally measured by the maximum number of dwelling units permitted per hectare of land (e.g. 20 units/ha). Residential density can be expressed as nett or gross density. Nett residential density (see Diagram below) refers to the density on a specific site, excluding public roads, social facilities and public open space, thus including only the area allocated for residential use. Gross residential density refers to the density of a specific site including the land occupied by infrastructure, social and economic facilities, such as schools, shops, open space and roads.

![Diagram 2: Density Measures](image_url)

It is important to note that net density is always higher than gross density. Whereas net density can be increased by decreasing the size of units and stands and increasing the height and coverage of buildings, the increase in gross density is limited by facility and space standards. By increasing the number of people in an area, more facilities such as schools, streets and open space are needed, thus taking up more space and lowering the gross density. Gross density can be increased by lowering open space standards and by sharing community facilities, such as sports fields.

A nett density is the most commonly used approach in housing development and is appropriate for development on sites where the boundaries of the site are clearly defined and where only residential uses are proposed. It is also appropriate for phased developments where individual housing areas within the development have been identified. **Nett density is the density measure used for residential areas in the Midvaal Density Policy.**
8. IMPLEMENTATION

Density guidelines enable the establishment of a coherent framework for the application of density standards within a municipal area. Density guidelines are used to direct planning at all levels, from strategic planning to development control and they are applicable to all types of land development. However, density guidelines should be used flexibly to take account of varying local circumstances.

A primary purpose of density guidelines is to ensure that adequate municipal services infrastructure and social amenities are planned to serve the needs of the existing and future population and to indicate areas where densities may need to be restricted to achieve this.

8.1 Density Options

There are many benefits to higher density development, because higher-density development allows a higher concentration of people, which in turn deliver the population thresholds required to support community facilities and municipal services. In addition, higher density development can support existing or future public transport systems by providing enough commuters within walking distance of such systems. Building at higher residential densities also means that less land is needed for any given number of dwelling units.

Despite the above, higher densities are not appropriate in all locations and could, if inappropriately applied; result in an urban form that damages the character of an urban area. For example, large dwellings on generous stands that provide a rural lifestyle environment would not be possible if high densities were a requirement for every location within a municipal area. Thus, residential density is closely linked to its location and the quality of the building design. As a rule of thumb, the aim should be to make the most efficient use of a site in terms of density without compromising the quality of the surrounding built-up environment. Based on the above, there are three possible density options that can be considered.

Option 1: A set density range that can be applied across the Municipal Area

One option could be to set an overall density range that would be suitable to be applied across the entire municipal area, with criteria as to when higher density development would be acceptable and when lower density would be acceptable. Higher densities would be provided on merit, such as the site’s proximity to social facilities, public open space or public transport stations. To an extent, this approach would allow densities to vary in different parts of the municipal area, thus encouraging a varied urban form. However, this approach tends to focus on set standards that are applied to individual sites, and is it therefore not a tool that can bring about large-scale changes in density.
Option 2: Different average densities for different areas based on an assessment of surrounding character and appearance

Another option could be to divide the municipal area into different areas based on similar characteristics and appearance; for example, identify areas with similar types of buildings and densities. An average density could be applied to these areas to reflect the location. For example, this approach could identify areas with high levels of public transport and then attribute development higher densities to these areas.

This approach would allow for the characteristics of an area to be taken into consideration. However, it is not necessarily the case that the density and design of existing developments should dictate that of a proposed development. A prescriptive policy approach could result in a replication of existing building typologies and densities and would not necessarily allow for change and innovative development.

Option 3: A criteria based policy that enables the highest density that is compatible with the surrounding environment

This option would allow density to be a product of design and not to be a general standard that is uniformly applied across a municipal area. It would allow for individual site requirements to be taken into consideration and would be applied on a site-by-site basis and could form part of a set of criteria for each individual site. Appropriate densities would thus vary in different parts of the municipal area, according to their characteristics. The criteria could include, amongst others, context, density and built form, impact on social amenities, quality of public realm, and parking provision.

Any proposed development would need to prove that good living conditions could be achieved on site. Good design will prove a fundamental part of this type of approach. The drawback of this approach is that it requires a great deal of management and control, which the Municipality may not be able to exert. Without extensive guidance, this approach will not result in good quality development.

Using a blanket approach (Option 2) would not be appropriate in Midvaal, because it will result in Midvaal urbanising to the extent that it loses its rural character. The criteria approach (Option 3) would not be suitable either, because the Midvaal Municipality in all likelihood does not have the capital and human resources to implement this approach. Option 1 would most probably be the best option to follow in Midvaal. The reason for this is the fact that this approach would only seek to density critical and specific areas within Midvaal, such as nodes, next to public transportation stations and near community facilities, thus retaining the overall rural character within Midvaal. Despite the aforementioned, it also has to be acknowledged that Midvaal is gradually urbanising and that densities related to a more urban environment will increasingly become a factor in determining appropriate densities within Midvaal.
8.2 Appropriate Locations for Increased Density

Increased urban densities are more suited for particular locations within an urban area than for other location within the same urban area. It is the presence of certain factors that make the densification of certain location within an urban area suited for densification. For example, these factors include the availability of municipal services infrastructure capacity and the proximity of community facilities. In fact, certain locations may be completely unsuited for densification due to density-deterring factors, such as poor geotechnical conditions and environmental considerations. Based on the presence of densification factors, the following locations are deemed suitable for densification:

a. Nodal areas

The increase of the residential population within or near nodal areas with its range of employment, shopping and entertainment uses tends to curtail travel demand and therefore has the potential to create sustainable urban development patterns. Increased residential populations within or near nodal areas also assist in the regeneration of older nodal areas, makes more intensive use of existing infrastructure within nodal areas, supports local services and employment, and sustains alternative walking and public transport as modes of travel. The development of infill sites within nodal areas also contributes to the improvement of the built form, if it reinforces the existing street pattern and re-develops neglected parts of the nodal areas. It is important to protect the architectural and environmental quality of existing nodal areas that have an identifiable character. In order to maximise residential populations within nodal areas, higher residential densities must be encouraged within nodal areas, subject to the following:

- Compliance with the policies and standards of public open space adopted by the Spatial Development Framework
- Avoidance of adverse impacts on the amenities of the nodal area and adjoining neighbourhoods
- Conformity with the vision of the nodal area or town centre expressed in the Spatial Development Framework, particularly in relation to height or massing
- Recognition of the desirability of preserving listed or protected buildings and their settings
- Compliance with stand ratio and site coverage standards adopted in the Spatial Development Framework

b. Brownfield sites

Brownfield sites can be defined as ‘any land which has been subjected to land use for which it is no longer suitable’, for example, a redundant industrial area or unused sites within residential areas. Where such significant sites exist and, in particular, where it is located near existing or future public transport corridors, the opportunity for the re-
development of such sites to higher density residential uses should be encouraged. Brownfield residential densification is of particular significance in areas that have spare capacity in existing community facilities, such as libraries and clinics, because the increased residential densities would maximise the use of these community facilities.

c. Suburban infill

The provision of additional residential dwellings within suburban areas in close proximity to existing or future public transport corridors has the potential to revitalise suburban areas by better utilising the capacity of existing social and municipal services infrastructure within these suburban areas. Potential sites may range from small unused residential sites in suburban areas, to larger assembled sites within suburban areas. In suburban areas that have an established architectural character, a balance has to be struck between the reasonable protection of the established character and the need to provide residential infill and densification. Densification in suburban areas should be evaluated on merit, based on the following evaluation criteria:

- Proximity to economic centres: The closer residential areas are to nodal areas, the higher the residential densities that could be allowed.
- Considering surrounding areas, sites and developments: This relates to building design and the privacy of neighbouring land owners.
- Carrying capacity of the residential area: The densification of properties should be based on the demand for property and infrastructure availability within the residential area.

d. Greenfield development

Greenfield development can be defined as undeveloped land on the periphery of towns of cities, which will require the provision of new roads, municipal services infrastructure and community facilities. Typically, such areas are usually developed at low densities. However, low development densities should be avoided in areas where higher residential densities would be more appropriate. Development at densities less than 20 dwellings units per hectare should generally be discouraged in the interests of land efficiency on land that is located near existing or proposed public transport routes and nodal areas. As a rule of thumb, infill development within the Urban Development Boundary should be promoted, rather than opting for greenfield development on the peripheries of towns and cities.

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e. Institutional properties

Typically, a considerable amount of land in cities, towns and suburban locations are owned by government institutions. Such properties are often characterised by large buildings set on large stands. In the event that the municipality or other governmental institutions permits the development of such properties for residential purposes, it should be done with cognisance of the existing open space function of these properties. The objective should thus be to retain some of the open character of the properties, but this should be done in the context of the existing open space lattice in the area. The setting out of density yields should be considered in advance of the development of properties in institutional ownership.

f. Subdivision of properties

Typically, towns and cities contain relatively large stands, whose subdivision for multiple residential dwellings without a dramatic alteration to the character of the surrounding area is achievable. In such areas, particularly those areas that are potentially served by public transport, the subdivision of such stands should be encouraged, subject to maintaining the general character of the area. The subdivision of residential properties is dealt with more extensively in a following section.

g. Previously disadvantaged areas

Considering the densification of previously disadvantaged areas is essentially and issue of placing people closer to employment opportunities. Such areas largely rely on public transportation to access employment opportunities and densification should thus be encouraged around transportation stations, such as bus and taxi ranks and commuter railway stations. The areas abutting public transit stations should be designed to enable the integration of land use and public transport according to the principles Transit Oriented Development (TOD). This involves the clustering of activities and the development of the necessary residential densities within TOD areas and gradually decreasing densities from the station area to allow an appropriate interface with neighbouring lower-density residential areas.

h. Transportation corridors

The concentration of transportation infrastructure (as in the case along the R59) in conjunction with potential development parcels located along such infrastructure; provides opportunities for land use intensification, resulting in corridor development. This provides opportunities, not only for land use intensification, but also to achieve a higher level of land use and transportation integration. The presence of a commuter railway further strengthens, such a transportation corridor, allowing additional land use intensification at its stations.
8.3 Proposed Density

The approach to be followed in this Density Policy is to set a base density that can be applied across the entire municipal area, with criteria stating when higher density development would be acceptable. The base density applied in this Density Policy is 20 units per ha for all single residential areas and 25 units per ha for sectional title developments, for development located within the Urban Development Boundary presented in the Midvaal SDF 2001. Higher residential densities are provided on merit, such as the proximity of a site’s location to community facilities, public open space or public transport stations. To an extent, this approach would allow densities to vary in different parts of the municipal area, thus encouraging a varied urban form.

8.3.1 Residential Densities inside UDB

This section sets out the criteria for residential densification within the Urban Development Boundary (UDB) of Midvaal.

a. Nodes

Nodal areas are the primary structuring element within urban areas and are usually areas where both private and public sector development is concentrated. Usually, nodes are associated with a mix of land uses and higher residential densities. Nodes usually accommodate a range of urban activities, including economic activities, services, entertainment and housing on a relatively intense scale.

The clustering of activities at higher densities within nodal areas achieve economic and infrastructure efficiency. At the same time, nodal areas need to be of a pedestrian scale, which allows walking as be to the primary means of moving around within the nodal areas. Thus, as a rule of thumb, nodes should be small enough to enable a pedestrian to walk from end to end, but not so small that economies of scale cannot be achieved. Higher residential densities are a key means to achieving this balance within and around nodes, as is set out in the Midvaal Nodal Policy 2011.

A residential density of 15 units per ha can be added to the base residential density of a residential development if the residential development is:

- located within 400m of a nodal area;
- the nodal area was identified as the core area of the Central Business District in the Nodal Policy and/ or SDF/ RSDF; and
- the nodal area is located within the Urban Development Boundary.
### Table 2: Permissible Residential Densities Within UDB

<table>
<thead>
<tr>
<th>Category</th>
<th>Categories used as criteria for increased density</th>
<th>Maximum distance from facility</th>
<th>Number of units per ha to be added to base density</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Node identified as the core area of the Central Business District in the Nodal Policy and/or SDF/RSDF</td>
<td>Within 400m</td>
<td>+15</td>
</tr>
<tr>
<td></td>
<td>Node as identified as Neighbourhood Node in Nodal Policy and/or SDF/RSDF</td>
<td>Within 200m</td>
<td>+10</td>
</tr>
<tr>
<td></td>
<td>Shopping facility that is not part of a node</td>
<td>Within 200m</td>
<td>+5</td>
</tr>
<tr>
<td>2</td>
<td>Transit stations (e.g. taxi rank, railway station, etc.) (TOD development)</td>
<td>Within 400m</td>
<td>+15</td>
</tr>
<tr>
<td></td>
<td>Distributor road (Class 3 road)</td>
<td>Adjacent to</td>
<td>+15</td>
</tr>
<tr>
<td></td>
<td>Collector road</td>
<td>Adjacent to</td>
<td>+5</td>
</tr>
<tr>
<td>3</td>
<td>Public open space</td>
<td>Adjacent to</td>
<td>+5</td>
</tr>
<tr>
<td>4</td>
<td>Social facility (school, clinic, library, sports facility etc)</td>
<td>Within 200m</td>
<td>+5</td>
</tr>
<tr>
<td></td>
<td>Special town planning merits (e.g. Transition Zone)</td>
<td>As considered by PPM</td>
<td>+5</td>
</tr>
</tbody>
</table>

*Base density is 20 units per ha and 25 units per ha for sectional title developments*

**Notes:**
- Each application may use a specific category only once. The base density is not a primary right and has to be applied for in accordance with the standard procedures as approved by the Midvaal Local Municipality from time to time.
- In the existence of a Precinct Plan, such densities as stipulated in the Precinct Plan shall be applicable and shall prevail for the for those areas to which the relevant Precinct Plan applies.
- PPM: Planners Permission Meeting

Source: Urban Dynamics Gauteng, 2011
### TABLE 3: PERMISSIBLE RESIDENTIAL DENSITIES OUTSIDE UDB

<table>
<thead>
<tr>
<th>Area</th>
<th>Permissible density for single residential</th>
<th>Permissible density for sectional title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henley-on-Klip</td>
<td>5 units/ha</td>
<td>10 units/ha</td>
</tr>
<tr>
<td></td>
<td>1 unit/ 2000 m²</td>
<td>1 unit/ 2000 m²</td>
</tr>
<tr>
<td>Highbury Ext 1</td>
<td>5 units/ha</td>
<td>10 units/ha</td>
</tr>
<tr>
<td></td>
<td>1 unit/ 2000 m²</td>
<td>1 unit/ 2000 m²</td>
</tr>
<tr>
<td>Ohenimuri</td>
<td>20 units/ha</td>
<td>25 units/ha</td>
</tr>
<tr>
<td></td>
<td>1 unit/ 500 m²</td>
<td>1 unit/ 400 m²</td>
</tr>
<tr>
<td>De Deur</td>
<td>1.26 units/ha</td>
<td>1.26 units/ha</td>
</tr>
<tr>
<td></td>
<td>1 unit/ 7 937 m²</td>
<td>1 unit/ 7 937 m²</td>
</tr>
<tr>
<td>Agricultural holdings and small holdings with piped water as supplied by MLM</td>
<td>1.16 units/ha</td>
<td>1.16 units/ha</td>
</tr>
<tr>
<td></td>
<td>1 unit/ 8 565 m²</td>
<td>1 unit/ 8 565 m²</td>
</tr>
<tr>
<td>Farm portions smaller than 20ha with piped water as supplied by MLM</td>
<td>1 unit/ha</td>
<td>1 unit/ 1 ha</td>
</tr>
<tr>
<td>Farm portions smaller than 20ha without piped water as supplied by MLM</td>
<td>0.2 units/ha</td>
<td>0.2 units/ha</td>
</tr>
<tr>
<td></td>
<td>1 unit/ 5 ha</td>
<td>1 unit/ 5 ha</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2011
### TABLE 4: PERMISSIBLE DENSITIES FOR NON-RESIDENTIAL AREAS

<table>
<thead>
<tr>
<th>Area</th>
<th>Maximum FAR</th>
<th>Maximum Coverage</th>
<th>Maximum Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Business District</td>
<td>1.8</td>
<td>60%</td>
<td>3 storeys</td>
</tr>
<tr>
<td>Neighbourhood node</td>
<td>0.8</td>
<td>40%</td>
<td>2 storeys</td>
</tr>
<tr>
<td>Rural node</td>
<td>0.4</td>
<td>40%</td>
<td>2 storeys</td>
</tr>
<tr>
<td>Commercial areas</td>
<td>0.6</td>
<td>40%</td>
<td>2 storeys</td>
</tr>
<tr>
<td>Industrial areas</td>
<td>0.6</td>
<td>40%</td>
<td>2 storeys</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2011

Notes:
- Midvaal Local Municipality may at its discretion require an application for increase density to taper down the Coverage and FAR of a proposed development in order to achieve a suitable density interface between the Central Business District core area and neighbouring residential areas, as proposed in the Midvaal Nodal Policy 2011.
A residential density of 10 units per ha can be added to the base residential density of a residential development if the residential development is:

- located within 200m of a nodal area;
- the nodal area was identified as a Neighbourhood Node in the Nodal Policy and/ or SDF/ RSDF; and
- the nodal area is located within the Urban Development Boundary.

b. Shopping centres

In modern-day urban areas that are vehicle-oriented, stand-alone shopping centres often function as nodal areas in themselves. Such shopping centres usually accommodate a range of business activities including retail, services and entertainment activities. Despite the fact that such shopping centres are typically inward-facing and therefore do not integrate well with neighbouring residential areas, the existence of the shopping centres need to be acknowledged. Amongst others, this involves creating higher residential densities near shopping centres to place people closer and within walking distances of such shopping centres.

![Diagram 3: Densification Areas](image)

A residential density of 5 units per ha can be added to the base residential density of a residential development if the residential development is:
• located within 200 of a shopping centre; and
• the shopping centre is located within the Urban Development Boundary.

c. Transit stations

Residential densification must be encouraged along public transportation routes to allow the viable operation of public transportation systems. Higher residential densities should especially be encouraged within close proximity of public transport stations to locate commuters within walking distance of such transport facilities. Intensified development around public transit stations is known and Transit Oriented Development or TOD. TOD tends to induce higher pedestrian volumes within walking distance of a transport facility, thus contributing to the viability of the public transportation network as a whole.

The only fixed-line public transportation system operating within Midvaal is the commuter rail line running parallel to the R59 freeway. This commuter rail line has a number of stations that can become the focal points of Transit Oriented Development. Residential densification should be encouraged around railway stations, with the highest residential densities concentrated adjacent to a commuter railway station. Bus and taxi ranks can also be considered public transportation stations around which TOD development and residential densification can take place.

A residential density of 10 units per ha can be added to the base residential density of a residential development if the residential development is:

• located within 400m of commuter railway station, bus rank or taxi rank, or similar public transportation facility; and
• the public transportation station is located within the Urban Development Boundary.

d. Development corridors

A development corridor refers to high activity areas that are located along major road transportation routes, such as a distributor roads or collector roads. Development corridors usually carry relatively high traffic volumes, which promotes the development of land use activity along these corridors. This usually leads to a high demand for residential, office and retail space along such corridors. Typical housing typologies that are often found within development corridors are townhouses, duplexes and walk-ups.

It is important to link development corridors to the road hierarchy. Typically, as in the case in Midvaal, the road network consists of roads functioning on 4 levels (see Diagram below). The first level contains freeways, consisting of national freeways and provincial PWV roads.
These roads provide regional access, connecting an area to neighbouring cities and towns. The second level comprises distributor roads or K-routes, which aim to provide better intra-urban access between suburbs and activity areas. The third level comprises collector roads. These roads connect residential areas to the mentioned distributor road network. On the fourth level, internal streets provide direct access to land uses and link these land uses to the mentioned collector roads.

In essence, freeways and distributor roads are highly mobile and therefore aim to connect people over large distances to activity areas and neighbouring settlements. Collector roads and internal streets provide good accessibility and therefore aim to connect people and land uses to the more mobile roads. Road-based public transportation systems (taxis and busses) mostly use distributor roads and collector roads, as these provide an efficient balance between mobility and land use accessibility, thus making them good locations for residential densification and corridor development.

A residential density of 15 units per ha can be added to the base residential density of a residential development if the residential development is:

- located adjacent to a distributor road; and
- the distributor road is located within the Urban Development Boundary.

A residential density of 5 units per ha can be added to the base residential density of a residential development if the residential development is:

- located adjacent to a collector road;
- the collector road is located within the Urban Development Boundary.
It is important to note that the concentration of higher density development along distributor and collector roads, instead of scattering this development along a large number of routes, will increase the feasibility of developing bus routes along these routes in future, should development within Midvaal reach the necessary thresholds. To this end, it is necessary that distributor and collector roads be identified that are suitable to function as public transport routes in future. These public transport routes must be identified proactively and strategic plans must be prepared for these public transport corridors in advance.

e. Social Amenities

Walking-distance access to community facilities, such as clinics, schools and public parks, is a fundamental requirement of sustainable urban development. To encourage the above, it is necessary to allow residential densification near community facilities, because this will increase the number of people living within walking distance of such facilities.

A residential density of 5 units per ha can be added to the base residential density of a residential development if the residential development is:

- located adjacent to an public open space; or
- located within 200m of a community facility, such as a school, clinic, library or sports facility, and
- the public open space and community facility is located within the Urban Development Boundary.

### 8.3.2 Residential Densities outside UDB

This section sets out the criteria for residential densification located outside the Urban Development Boundary or UDB of Midvaal.

a. Specific areas

Permissible densities for single residential and sectional title have been set for 4 existing residential areas within Midvaal. These residential areas are:

- Henley-on-Klip
- Highbury Ext 1
- Ohenimuri
- De Deur

The residential densities applicable to these areas are set out in the Table 3. Henley-on-Klip and Highbury Ext 1 has a maximum single residential density of 5 units/ha and a maximum sectional title density of 10 units/ha. Ohenimuri has a maximum single residential density and
a maximum sectional title density of 20 units/ha. De Deur has a maximum single residential density and a maximum sectional title density of 1.26 units/ha.

b. Agricultural holdings and small holdings

In rural residential areas, such as agricultural holdings and small holdings, residential densities need to be much lower than those in the urban areas, partly because of the limited capacity of rural roads and municipal services infrastructure to cater for densification. In many cases there is also the need to limit densification in order to protect the rural environment from urban encroachment and to provide a rural lifestyle for those families who wish to adopt such a lifestyle. Typically, agricultural holdings and small holdings have residential densities within the 1 to 0.4 units per ha range.

The subdivision of an agricultural holding and small holding to a maximum density of 1.16 units per ha or 1 unit per 8565m² will be permitted, subject to the following conditions:

- The owner can prove to have adequate water supply;
- that the subdivision will not pose any pollution problems related to sanitation,
- that the road infrastructure can handle the resulting increased traffic volumes, and
- that the relevant farm portion is not located on high-potential agricultural soils.

c. Farm portions

The primary aim of farm portions is for intensive and extensive commercial farming purposes to ensure national food security. Applying appropriate residential densities is key to maintaining this overarching function. Conventionally, 20 hectares is considered the minimum farm portion size that allows commercially viable farming practices. It is therefore not desirable to subdivide farm portions larger than 20 hectares in size. The subdivision of farm portions smaller than 20 hectares is justified in certain cases.

The subdivision of a farm portion smaller that 20 hectares to a farm portion with maximum densities of 1 unit per hectare is subject to the following conditions:

- Piped water is provided by the Midvaal Local Municipality;
- that the subdivision will not pose any pollution problems related to sanitation,
- that the road infrastructure can handle the resulting increased traffic volumes, and
- that the relevant farm portion is not located on high-potential agricultural soils.
The subdivision of a farm portion smaller than 20 hectares to a farm portion with a maximum density of 0.2 units per hectare or 1 unit per 5ha is subject to the following conditions:

- The owner can prove to have adequate water supply from local sources, such as boreholes;
- that the subdivision will not pose any pollution problems related to sanitation,
- that the road infrastructure can handle the resulting increased traffic volumes; and
- that the relevant farm portion is not located on high-potential agricultural soils.

### 8.3.3 Non-Residential Densities

This section sets out the criteria for non-residential densification located within the Urban Development Boundary or UDB of Midvaal.

#### a. Nodes

Typically, nodes are associated with a mix of land uses and developed at relatively high densities, because space is at a premium within nodal areas. Nodes usually accommodate a range of urban activities including retail centres, office buildings and apartment blocks.

The clustering of activities at higher densities within nodal areas achieve economic and infrastructure efficiency and should therefore be promoted. Densification is a key means to achieving this and it logically requires the sensible application of density within nodal areas, which must adhere to the following criteria:

- In a Central Business District, a maximum non-residential FAR of 1.8 at 60% coverage is allowed.
- In a Neighbourhood node a maximum FAR of 0.8 at 40% coverage is allowed.
- In a Rural node a maximum FAR of 0.4 at 40% coverage is allowed.
- The densities are only allocated to properties located within the nodal boundaries delineated in the Midvaal Nodal Policy of 2011 or the Midvaal SDF/RSDFs of 2011.

#### b. Commercial and Industrial

Commercial areas provide space for commercial and light industrial activities, such as distribution centres, storage, wholesale and warehousing, and industrial areas provide space for heavy and noxious industrial activities. In Midvaal:

- commercial areas are allowed a maximum FAR of 0.6 at 40% coverage;
- industrial areas are allowed a maximum FAR of 0.6 at 40% coverage; subject to
- the commercial and/or industrial area being located within the Urban Development Boundary.

In addition, stringent development controls must be implemented within commercial and industrial areas to ensure an acceptable interface between these commercial and industrial areas and neighbouring residential areas. Logically, this requires the sensible application of density within commercial and industrial areas.

### 8.4 Controls and Safeguards

As was mentioned previously, densification should occur in areas where municipal services infrastructure capacity is available, densification must occur within acceptable environmental limits, and densification must aim to increase commuter intensity near public transport stations. To achieve this, densification criteria have been proposed in the previous section of this report. However, these criteria are largely quantitative and thus pose the risk of not being able to address the qualitative aspects of densification. To address this, the following controls and safeguards are proposed to supplement the densification criteria proposed.

#### 8.4.1 General Safeguards

The following general safeguards should be taken into account when assessing applications for higher residential and non-residential densities:

- Higher densities should be considered for all stand sizes, but is usually more appropriate for larger stands.
- Proximity to nodal areas and existing or planned public transport routes are appropriate for higher densities.
- The quality of the architectural design must be paramount when allowing higher densities.
- All development proposals on large stands should be encouraged to have a variety of dwelling types.
- Stands earmarked for higher residential densities should have access to a range of community facilities, shopping facilities and employment opportunities.
- Detailed landscape proposals should be included in all applications for higher-density developments.
- The provision of pedestrian linkages between higher-density developments and to open spaces and community facilities should be required.
- Levels of privacy should be maintained and this has to do with the relationship of buildings to one another, potential overlooking, and the use of screening.
Proposals for traffic calming should form part of a densification application to ensure the safety of the increased pedestrian numbers that are a result of the densification.

8.4.2 Overlooking and Overshadowing

Overlooking and overshadowing is critical issues related to higher residential densities. It is essential that residential dwellings are not subject to undue observation by neighbouring dwellings and that no undue loss of sunlight is caused by overshadowing from adjoining, higher buildings. This applies to all dwellings, whether they are located in new or established residential area.

- Overlooking: With the evolution of more innovative residential layouts and the incorporation of a wider variety of dwelling types, standards regarding overlooking may have to be used flexibly. Flexibility must be employed in the assessment of the overlooking aspects in residential design. However, this flexibility must not be abused.
- Overshadowing: Overshadowing will generally only cause problems where buildings of significant height are involved or where new buildings are located close to adjoining buildings. As a result, buildings that are significantly higher than neighbouring developments may be inappropriate for such a location and can on such grounds be refuted. Higher buildings may be appropriate close to a public open space or in a nodal area.

8.4.3 Public Open Space

Public open space is a key element in defining the quality of a residential and nodal environment. The achievement of higher residential and non-residential densities must therefore be coupled with the provision of public open space. Emphasis should be placed on the quality of open space to be provided. The objective should be to create well designed open spaces that are accessible higher-density housing development within residential areas and non-residential buildings within nodal areas.

9. CONDITIONS FOR SECOND DWELLING UNIT

This section describes the policy for ‘dual occupancy’ or ‘a second dwelling unit’, which is the use of a single residential stand for the purpose of two dwelling units. Dual occupancy essentially allows for the densification of an urban area, but can also be allied to rural residential areas, such as small holdings.

Midvaal has the potential for the increased occupancy of residential areas, largely due to the large residential stand sizes that exist within Midvaal. Due to these large stand sizes, residents within Midvaal do not have many
opportunities to move into smaller dwelling units in the same neighbourhood if the need arises. Allowing second dwellings to be established on existing properties would be responding to the need to:

- increase the supply of rental accommodation within residential areas;
- provide a wider housing choice in terms of type and location;
- encourage the better use of existing open space, services and municipal services; and
- provide more housing opportunities for special housing groups, such as the aged.

Normally, addressing the above would involve the demolition of existing housing stock before new, higher-density housing stock can be constructed. Dual occupancy would allow for a more intensive use of buildings and stands without requiring the demolition of existing housing units. Encouraging dual occupancy in the residential areas of Midvaal will inevitably provide additional housing units in these residential neighbourhoods that are smaller in size, thus also diversifying the range of housing sizes provided within these residential areas.

However, densification through dual occupancy must be subject to the availability of the necessary community facilities, municipal services and open space to serve the increased population numbers. Without the proper control, the impact of second dwelling units on existing residential areas could lead to reduced residential amenity. In response to this concern, this policy outlines the conditions which are intended to control the development of second dwelling units.

Generally, it is intended that any development under this policy would conform to the single family dwelling house character of a residential area and that reasonable levels of amenity would be retained. It is also the intention of this policy that a dual occupancy development remains on the original stand and that such a development is not separately titled. This is because:

- Single titles will assist in the maintenance of the character of a residential area
- Single titles will encourage the provision of rental accommodation
- A separate title would encourage the different treatment of the two dwellings in design terms
- Future redevelopment of the area may require land assembly and this would be impeded by unnecessary stand fragmentation.

### 9.1 General Conditions

A second dwelling unit can be defined as follows:

‘A second dwelling unit is a secondary and separate residential unit containing bedrooms, a kitchen, and bathroom facilities, located on a residentially zoned stand that contains a single-family residence as a
The second dwelling unit can either be attached or detached from the existing dwelling unit located on the stand.

The objectives of this policy on dual occupancy are:

- To supplement the existing supply of housing, particularly rental accommodation
- To encourage better use of existing municipal services and facilities in established residential areas
- To encourage a greater variety of housing typologies
- To enable existing residents to remain in their current neighbourhood in housing more suited to their needs if their needs change
- To ensure that conversions to dual occupancy do not produce undesirable planning, environmental or other consequences in residential areas.

This policy applies to all detached housing stands within Midvaal with a minimum stand area of 750 m$^2$. However, the size of the stand is not on its own sufficient reason to approve a second dwelling. In some cases a stand may not be suitable to accommodate an additional dwelling unit because of its unusual shape, its exposed boundaries, its topography, geotechnical conditions, etc. Thus, applications for dual occupancy must be assessed on individual merit to determine whether the policy should be applied. The policy allows for:

- The development of an additional dwelling on a stand
- The conversion of an existing dwelling into two dwellings
- The demolition of an existing dwelling and its replacement by two dwellings

The additional dwelling may be either detached from the original dwelling or attached to it. In most cases, an attached additional dwelling would provide a more attractive and effective solution for small stands. Where the additional dwelling is detached, sensitive integration of the two dwellings will be required.

### 9.2 Specific Conditions

In assessing applications for the development of a second dwelling on a stand, several circumstances in relation to each individual case and its merits need to be taken into account. These must include:

- Whether the proposal would be consistent with the general planning and development intentions for the area concerned, and specific policy plans and development plans for areas where these have been prepared
- The effect that the proposed development may have on the social amenities of the relevant neighbourhood
- Whether the proposed development could be accommodated within the existing municipal services capacity of the neighbourhood
- Whether the traffic likely to be generated by the proposed development could be accommodated adequately on the road network and whether adequate provision is made for parking
- Whether the proposed development would adversely affect conservation areas or the natural environment.

Based on the above, the following specific condition are set for the approval of a second dwelling unit:

a. Setbacks and interface

Minimum setbacks will be required and determined on the basis of the existing setbacks for the existing detached house. However, greater setbacks may be required in some cases in order to ensure that neighbouring interfacing dwellings are private and retain sufficient daylight.

Applicants for second dwelling units must be required to show what impact building or demolition proposals will have on adjacent properties. In particular, vehicle access and parking areas will need to be related to adjacent developments.

b. Community involvement

Prior to consideration of an application for dual occupancy, neighbours will need to have been informed of the proposal. Neighbours for this purpose are considered having a mutual boundary with the subject stand. Where comments are received from neighbours, these comments must be used to determine whether or not the conditions (set out in this policy) for the development of a second dwelling unit are satisfied and to establish conditions of approval so that the intentions of the policy regarding dual occupancy can be met. **The invitation to comment must apply to the design and positioning of buildings and not to the applicant's opportunity to develop an additional dwelling.**

c. Architectural character

The character of a residential neighbourhood is made up of the architectural design of the houses and the landscape setting. The addition of an extra dwelling unit will need to be assessed in relation to the neighbourhood character, in particular the existing house on the stand. Development of a second dwelling must be harmonious in scale, materials, form and character with the existing detached house on the site and with other dwellings in the neighbourhood, if the other dwellings in the neighbourhood are of a particular and unified architectural character. If a contrasting architectural style is proposed, which contrasts the style of the original buildings (e.g. old versus new), this needs to be done by a **competent architect who understands the use of contrast to enhance overall building design and appearance.**
d. Building height

The impact of an additional dwelling unit may be most apparent in the addition of an extra storey. It is therefore considered important to limit building height to the conditions that neighbours could have expected under the existing design and positioning conditions of the title deed of the stand in question. The maximum height, where an additional dwelling is to be attached to an existing detached house, shall be two storeys. Where an additional dwelling is to be detached from the existing house, single storey development is preferred.

e. Parking

Vehicle parking spaces are required to be provided at the rates depicted by the Table below. The construction of a carport or garage must comply with the design and positioning conditions of the title deed of the stand in question. Car parking spaces are to be located behind the minimum building line and at least two spaces are to have unimpeded access.

<table>
<thead>
<tr>
<th>Combined number of bedrooms</th>
<th>On-site parking spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 or less</td>
<td>2</td>
</tr>
<tr>
<td>4 or 5</td>
<td>3</td>
</tr>
<tr>
<td>6 or more</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2011

Unless parking is controlled it will have an adverse impact on the existing residential character of a residential area. It will therefore be a condition of approval that the area in front of the house is landscaped and not simply converted into a ‘car park’.

f. Landscaping

The quality of a residential environment is largely determined by the street landscape (e.g. tree-lined streets), which is reinforced by the front gardens of residential properties. It is essential that in the application for a second dwelling unit, the area between the building and the front property boundary does not deteriorate. Deterioration could occur through the introduction of an additional vehicular access, parking in front of the building or through a lack of significant planting.

Applicants for a second dwelling unit should be encouraged to take access from a single driveway, in the interests of preserving the existing streetscape. Existing street trees are to be retained where possible, especially existing mature trees on the stand. In order to achieve this, the Council can require the submission of an acceptable landscape design. Screening by using landscaping may be required to prevent overlooking of neighbouring property.
g. Garden

Each second dwelling unit must have access to at least 50m² of useable garden to provide a private outdoor living area. Useable garden space must have a minimum dimension of 3m. Screening by landscaping or walls may be required to prevent overlooking and ensure privacy of each dwelling and its garden area. In exceptional circumstances, joint use of garden space may be permitted.

h. Municipal services

The requirements of Midvaal for access to municipal services capacity must apply. The cost of any augmentation of municipal services infrastructure and the cost of service connections will be borne by the applicant for a second dwelling unit.

10. DENSIFICATION MANAGEMENT

The administrative context for the management of residential density in Midvaal must be based on statutory powers, as well as on administrative measures. This policy provides the statutory powers, which explicitly sets density criteria and provides for its enforcement. The administrative measures can include a range of incentives and disincentives to encourage densification in a spatially desirable manner.

10.1 Incentives and Disincentives

It is imperative that higher densities be sought throughout Midvaal in strategic locations to ensure a more sustainable urban structure, but also to ensure that Midvaal can accommodate future population growth rates within the municipal area. To this end, residents and developers should be encouraged to develop at higher densities within Midvaal. The following incentivises and disincentives that encourage higher density development can be considered:

a. Incentives

- Bulk service contribution reductions can be provided for development application that aims to densify a property in a suitable area and complies with the densification criteria.
- Special provisions can be made by Midvaal for the fast-tracking of land-use applications that aims to densify a property in a suitable area and complies with the densification criteria.

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• Special municipal rates or property taxes can be used to stimulate the development of properties in suitable areas and comply with the densification criteria.

b. Disincentives

• Midvaal could place a moratorium on the approval of higher-density land use rights in areas that are unsuitable for higher urban densities. Such a moratorium could be taken up in the IDP and Spatial Development Framework and given effect through the Land Use Management System.
• Parking control can be used to encourage the use of public transport and the development of higher densities near public transportation routes.
• Suspending infrastructure provision in peripheral areas can be used as an urban containment measure that functions in a similar manner than the Urban Development Boundary does, thus forcing developers to invest inward rather than outward.

10.2 Direct Public Investment

In order to achieve an urban environment that is conducive to densification, Midvaal will have to invest in aspects such as:

• the provision of community facilities and open space in areas earmarked for higher densities
• the provision of an efficient, high-quality public transport network over the long run to coincide with the urbanization of Midvaal
• the provision of municipal services infrastructure to support higher densities

Investment by Midvaal as set out above is essential to provide the appropriate environment for private investment in higher-density development. The practical way of doing this is through the IDP, which aligns the municipal budget to encourage higher density development in appropriate areas of Midvaal.

10.3 Targets and Timeframes

Densification in Midvaal is not a short-term initiative, but will only be achieved over the longer term. It is therefore important to structure the process of densification in such a way that certain targets can be met within certain shorter-term timeframes, which allows each smaller target achieved to contribute to the ultimate, long-term goal of densification.

Short term targets should focus on the existing municipal infrastructure capacity, the availability of community facilities and open space, the existing public transport network (even if only a taxi and provincial bus system), and
budget constraints. These short term targets must endeavour to create some densification within the existing current constraints. Longer term targets can be based on the assumption that Midvaal will eventually develop into a larger urban area, which is integrated with Johannesburg and Ekurhuleni, and which will be able to support higher densities and a more permanent public transport network.