

SECTION 4: LAND USE MANAGEMENT

4.1. LAND USE MANAGEMENT ZONES

Land use management zones have been identified in support of the Parktown-Sunninghill BRT system. These land use management zones are demarcated on Figure 4.1. These zones aim to create a specific land use character in specific areas along the BRT route. Ultimately, these land use management zones will be used to guide rezoning and township establishment applications within the areas that they apply. As far as possible, the proposed land use management zones have given consideration to existing land use patterns, zoning precincts and the Johannesburg MSDF objectives. The following land use management zones are proposed:

Zone 1A: High-density mixed-use nodal core

This zone is used to demarcate the primary node along the BRT route and coincide with the regional mixed-use nodes identified in the Johannesburg MSDF. Consequently, it is the primary land use zone within the Study Area supporting the BRT system and therefore needs to be developed in a manner that best supports the BRT system. This support is best achieved by increasing the densities within this zone, which in turn should increase the number of commuters within this zone. This is best done through higher density residential development, but also by encouraging the development of non-residential uses that generate significant commuter numbers, such as retail and office developments.

Currently, this zone delineates areas that are existing retail and office areas. This land use make-up needs to be further encouraged at higher densities, as these are high-yielding commuter generators. Another land use to be encouraged within this zone is high-density residential uses, with preference given to lower-cost residential types. Medical and community facilities, such as a clinic or post office, should be allowed within this zone. Educational uses are better suited in more peripheral areas. This zone needs to be developed as the highest density zone within the Study Area, allowing a maximum FAR of 2.4, a maximum coverage of 60% and a maximum building height of 4 storeys.

Zone 1B: Medium-density mixed-use nodal periphery

This zone forms the peripheral area surrounding a nodal core (Zone 1A). The primary aim of this zone is to support the nodal core with land uses that are needed within this node, but are not ideally suited for the nodal core. This support function will require that this zone be developed with an intense mix of land uses, at slightly lower densities than the nodal core.

This zone must allow almost the entire range of land uses; provided these land uses can be developed at relatively high densities. Land uses to be included in this zone are medium to high density residential uses, including accommodation uses such as hotels and lodges. The full spectrum of community facilities, educational facilities and medical facilities are to be developed in support of the higher-density residential component in this zone, as well as in Zone 1A. Retail and motor trade uses (i.e. filling stations, showrooms, etc.) are to be accommodated. Formal office development, as well as governmental offices should be encouraged within this zone. Development limits include a maximum FAR of 1.2, a maximum coverage of 40% and a maximum building height of 3 storeys.

Zone 2A: Medium-density mixed-use nodal core

This zone is used to demarcate the secondary nodes along the BRT route. Typically, these nodes coincide with the district mixed-use nodes, as identified in the Johannesburg MSDF. One of the primary functions of this zone is to create or strengthen smaller nodal areas along the BRT route in order to avoid 'dead' zones along the route. 'Dead' zones are areas that do not have high enough densities and/ or a great enough mix of land uses to support the BRT system along that section of the BRT route. By stimulating these nodal areas, the BRT system is ensured active stations along the entire BRT route.

The land use configuration within this zone is similar to that of Zone 1A. The land uses to be encouraged within this zone include retail and office development, as well as selected social amenities. Higher-density residential development is also encouraged within this zone. This zone differs from Zone 1A in respect of its development densities. This zone allows a maximum FAR of 1.2, a maximum coverage of 40% and a maximum building height of 3 storeys.

TABLE 4.1: STANDARD LAND USE MANAGEMENT SYSTEM

Development Controls	Category	Detailed Category	Regional Node		District Node		Residential Area				Parking	
			Zone 1A High-density mixed-use nodal core	Zone 1B Medium-density mixed-use nodal periphery	Zone 2A Medium-density mixed-use nodal core	Zone 2B Low-density mixed-use nodal periphery	Zone 3 High-density residential node	Zone 4 Medium-density residential zone	Zone 5 Low-density residential zone	Zone 6 Very low-density residential zone		
Land Use	Residential	Very low-density (10 u/ha)									•	
		Low-density (20 u/ha)								•		
		Medium-density (30 u/ha)		•		•		•				
		High-density (80 u/ha)	•	•	•		•					
		Accommodation	•	•	•	•						
	Social	Educational		•		•	•	•	•	•	•	
		Medical	•	•	•	•	•	•	•	•	•	
		Community facility	•	•	•	•	•	•	•	•	•	
	Business	Retail	•	•	•	•						
		Office	•	•	•	•						
		Home office						•	•			
		Motor trade		•		•						
	Institutional	Municipal		•		•						
		Government		•		•						
	Industrial	Light										
		Commercial		•		•						
		Heavy										
	Open space	Active		•		•	•	•	•	•	•	
		Passive						•	•	•	•	
Max. FAR			2.4	1.2	1.2	0.6	n/a	n/a	n/a	n/a	n/a	
Max. Coverage			60%	40%	40%	30%	n/a	n/a	n/a	n/a	n/a	
Max. Height			4 storeys	3 storeys	3 storeys	2 storeys	n/a	n/a	n/a	n/a	n/a	
Max. Density			n/a	n/a	n/a	n/a	80 u/ha	30 u/ha	20 u/ha	10 u/ha		

Source: Maluleke Luthuli and Associates, 2007

Johannesburg MSDF Mixed-Use Node Classification:

- Regional: Parktown, Rivonia, Sunninghill
- District: Illovo, Killarney, Morningside (added), Saxonwold (added)

Zone 2B: Low-density mixed-use nodal periphery

This zone aims to create a low-density mixed-use periphery surrounding Zone 2A. Therefore, the accent of this zone is more on the development of a land use mix than on the development of higher densities. Land uses to be accommodated within this zone include medium density residential uses, retail facilities, private and governmental offices and motor trade businesses. In particular, this zone is suited for the development of community facilities that support the higher-density zones, such as schools, hospitals, clinics, police stations, emergency services and other social amenities. This zone does not accommodate a high development density, allowing a maximum FAR of 0.6, a maximum coverage of 30% and a maximum building height of 2 storeys.

Zone 3: High-density residential node

High-density residential development is a primary land use element supporting any BRT system. This zone aims to encourage such higher residential densities, but excludes the land use mix use that is prevalent in Zones 1 and 2. This zone is mostly located within existing residential areas and therefore aims to maintain the residential character, whilst achieving development densities that are more suited for the BRT system. Thus, land uses to be allowed in this zone include medium to high residential uses and uses directly supporting this higher density residential component, such as education, medical and general community facilities. Because this is a purely residential zone, 'units per hectare' is used as a measurement in stead of FAR. A maximum of 80 units/ha is allowed within this zone.

Zone 4: Medium-density residential zone

A BRT system is limited with regard to the commuter volumes it can accommodate and consequently has a ceiling land use density that it can serve along its route. These higher densities are typically spent in the nodal areas (Zones 1, 2 and 3) along the route, thus limiting densities in the areas located between these nodes, even though these areas may be within walking distance of the BRT system. To best utilize these areas and in particular the accessibility of these areas to the BRT system, it are proposed for medium-density residential uses.

A maximum of 30 units/ha is allowed within this zone. These densities typically involve the development of horizontally attached and vertically attached cluster housing. Supporting facilities to be developed within this zone include schools, clinics and home-based offices. Both active and passive open space can be provided within this zone, not only to support this zone, but also to support the higher-density nodes proposed.

Zone 5: Low-density residential zone

As with zone 4, this zone aims to create higher residential densities within walking distance of the BRT system. A maximum of 20 units/ha is allowed within this zone. At this residential density, this zone is suitable for horizontally attached cluster housing. Support facilities to be provided in this zone include education, medical and community facilities, as well as active and passive open space as required.

Zone 6: Very low-density residential zone

This zone is used in existing residential areas that are not earmarked for land use change or densification. In other words, the residential character of these areas needs to be maintained. This involves the strict management of land use development within these residential areas and curbing the proliferation of non-residential land uses, in particular retail and office developments. Allowed non-residential uses include educational, medical community and open space uses. A maximum of only 10 units/ha is allowed within this zone.

4.2. DENSITY INCENTIVES

Land use density is one of the critical elements in achieving a land use structure along the Parktown-Sunninghill BRT route that will support the operation of the BRT system. The primary reason for this is the fact the higher land use densities generate pedestrian (commuter) traffic, which ensure patronage of this public transportation system. In addition to density, the land use mix is another critical element. A land use mix increases the number of reasons for being in a specific node along the BRT route. Land use mix is closely related to density, as different land uses have different densities.

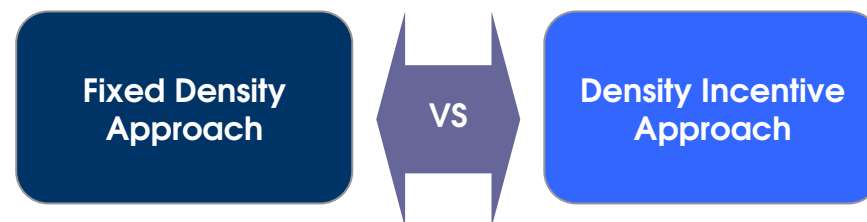


DIAGRAM: DENSITY CONTROL ALTERNATIVES

Land use densities allowed within a given area can either be fixed or it can be incentive-based. A fixed density approach involves pegging the maximum land use density within such an area and enforcing that density through rezoning and township establishment applications. The incentive approach involves a standard maximum land use density for a given area, allowing additional densities for properties that 'earn' these additional densities by complying with certain conditions, as set out by the density incentive programme. The incentive-based approach is also enforced through rezoning and township establishment applications.

Other Advantages of the Incentive Approach

Advantages of the incentive approach are as follows:

- Allows developers a greater degree of flexibility and choice
- Developer friendly as it does not force compliance
- Encourages a greater mix of land uses
- Uses free-market and profit principles
- Enables metropolitan planners to bargain for non-profit land use inclusion (such as affordable housing and public facilities)
- Illustrates to local communities the willingness of developers to create more sustainable developments
- Provides local communities with trade-offs for higher densities

Logically, the incentive approach is more flexible than the fixed approach as it allows developers and local government to 'negotiate' densities on an earn-reward bases. Another major difference between the two approaches is the land use mix that can be obtained. In essence, the incentive approach allows local government greater leverage to negotiate a land use mix than does the fixed density approach. Under the fixed density approach, developers tend to use the allowed density with land uses that provide them with high returns on their investment: usually retail or office space. Land uses that have public objectives, such as providing necessary community facilities and low-cost housing, are not considered. Under the incentive approach, local government has the ability the leverage the inclusion for such land uses in return for higher densities granted to the developer. Another significant difference between the approaches is the administration process involved. Whereas the fixed density approach is a relatively straight-forward and clear-cut approach, the incentive approach requires more administration (additional deeds registration and legal agreements) and the ability of local government officials to negotiate the density and mix with developers, within the parameters set out by the density incentive programme.

In context of the above, it is clear that the incentive approach is not an approach to be applied to all areas within a metropolitan area, but rather a tool to be applied to very specific areas within a metropolitan area where very specific municipal goals and objectives are to be obtained using the incentive programme. The incentive approach is most effective in areas where development pressures are high, as it needs to entice developers to use the density incentives. The incentive approach is almost ineffective in areas with low development pressure.

4.2.1. DENSITY BONUSES

Density Bonuses in a density incentives that have been successfully implemented in a number of North American towns and cities to achieve a number of public goals, including the densification of public transportation spines. To date, this incentive scheme has not been implemented within South Africa, but certainly has the potential to be used in selected cases, such as the creating a more transit-supportive land use structure along BRT routes that traverse high-growth areas within a metropolitan area.

4.2.1.1. DEFINITION AND COMMON USES

A density bonus is an incentive-based tool that permits developers to increase the maximum allowable density on a property (as permitted by the property zoning) in exchange for assisting a municipality in achieving its public policy goals, such as providing low-cost housing. The benefit of this approach is that it is voluntary and flexible, achieving a greater agreement and understanding between the developer and the municipality. ***This tool works best in areas where growth pressures are strong and land availability is limited.***

Density bonuses can be used to further a number of public policy goals. Some of these goals include the following:

a. Environmental Protection

Density bonuses are commonly used to promote conservation or improvement of natural resources and open space. A municipality may allow a developer to build more units than is permitted in an area in exchange for permanently protecting open spaces or by making environmental improvements such as with landscaping or developing a nature

trail in a project area. This technique can be used to protect land on the property being developed or on another property.

b. Affordable Housing

Density bonuses are often used to increase the supply of affordable housing for low income or senior citizen households. Density bonuses permit developers to increase the floor area or number of units allowed on a property if they agree to restrict the rents or sales prices of a certain number of units within their development for low income or senior households. The additional cash flow from these bonus units offsets the reduced revenue from the affordable housing units.

c. Transportation

Providing density bonuses for the development of housing units is often linked to transit and specifically public transit. This is largely done to ease traffic congestion and is implemented by directing new housing to areas that are well-served by public transportation, by allowing density bonuses in designated transit zones. An incentive often linked to density bonuses in this regard is a reduction in parking requirements.

d. Social Amenities

Increasing residential densities using density bonuses inevitably increase the need for social amenities. However, social amenities are not as profitable to provide as, for example, retail, office and even residential space. To address this, density bonuses can be granted in exchange for social amenities. Such amenities can include the development of social facilities, such as schools or clinics, as well as the development of pedestrian facilities, such as pedestrian walkways or plazas.

4.2.1.2. TRANSIT ZONES

Generally, density bonuses only apply to specific areas or zones, where these density bonuses aim to promote a specific land use structure. Transit zones are defined as areas where the use of a public transport system (such as BRT) is promoted through the development of a transit-supporting land use structure. Transit zones exhibits some or all of the following characteristics:

- A mixed-use area centered on a transit station that is planned and designed so that residents, workers and shoppers find it convenient and attractive to patronize transit.
- Increased residential densities within walking distance of a transit station.
- A mix of housing types, including affordable housing types, within walking distance of a transit station.
- Pedestrian access to the transit station with attractively designed and landscaped pathways.
- A public transit system that encourages and facilitate inter-modal transport and discourages the use of private vehicles.

Public benefits obtained through the development of transit zones include a reduction in traffic congestion and increased transit revenue yields, an increased in the affordable housing stock, travel options for different populations groups, the promotion of infill development, the promotion of a safe, attractive and pedestrian-friendly urban environment, the reduction of the need for additional travel by providing goods and services at transit stations, the promotion of job opportunities, improved cost-effectiveness through the use of the existing infrastructure, increased sales and property tax revenue, an a reduction in energy consumption, in particular fossil fuels.

4.2.1.3. INCLUSIONARY HOUSING

Internationally, a number of municipalities are adopting an inclusionary housing policy with the intent of increasing the supply of affordable housing within their areas of jurisdiction. Inclusionary housing encourages the provision of affordable housing in up-market developments or areas, typically by providing density bonuses and other incentives in exchange. These municipalities recognize that, in some residential markets, affordable housing would not be produced without government intervention. Thus, the purpose of inclusionary housing is to:

- Require the construction of affordable housing as a portion of new development within the community; or
- Create incentives for the provision of affordable housing as a portion of certain new developments;
- Implement the affordable housing goals, policies, and objectives contained in the local government's housing plan;
- Ensure that critical governmental service workers (e.g., teachers, firefighters, and police officers) can afford to live in communities where they work, despite their low pay.
- Provide affordable housing for employees of businesses that are located within up-market areas;
- Maintain a balanced community that provides housing for people of all income levels; and
- Implement planning for affordable housing as required by the local government.

In Gauteng a mandatory approach to inclusionary housing is considered by the Provincial Government as part of their housing policy, forcing developers to provide affordable housing as part of their up-market residential developments. However, such an approach does not obtain buy-in from developers. This poses the danger of prompting developers to find and use every loophole in the system to sidestep this initiative. It also creates a potentially negative relationship between developers and governmental bodies, especially those tasked with enforcing the policy.

4.2.2. DENSITY BONUS APPLIED

4.2.2.1. UNDERSTANDING ZONING TERMINOLOGY

The zoning terminology is clearly defined in the Johannesburg and Sandton Town Planning Schemes. The following definitions do not attempt to replace these definitions of the Scheme, but only aim to clarify what is meant by the zoning terminology used within the context of this document. The following zoning terminology is defined for this purpose:

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. Basement parking is not considered a storey.

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. 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). FAR (see below) is applied to mixed-use buildings that contain both residential and other uses.

d. 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.

e. Floor Area Ratio (FAR)

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 (see Diagram below).

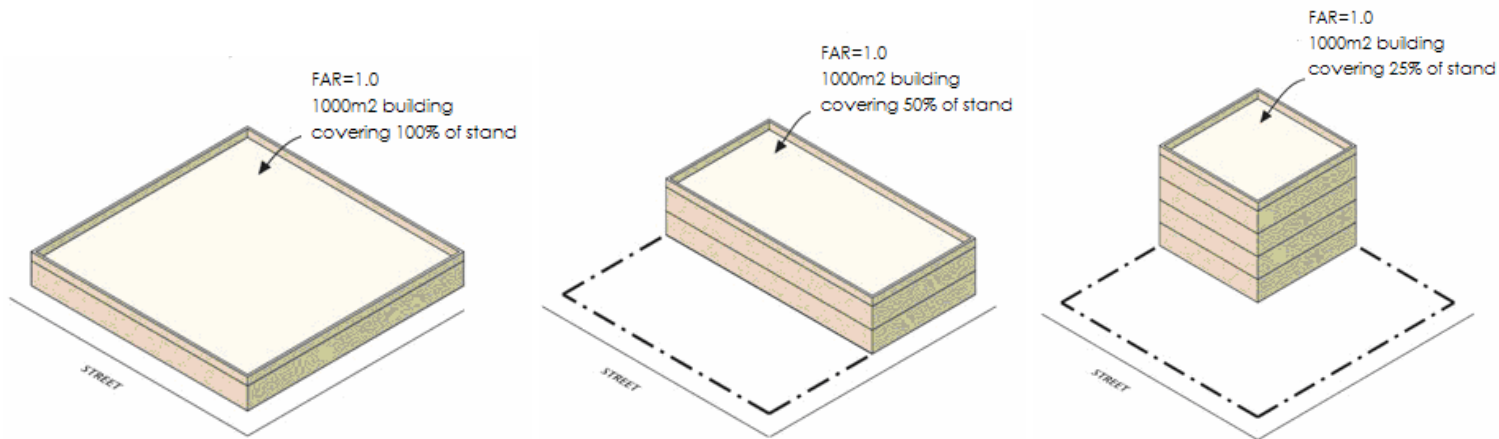


DIAGRAM: CALCULATION OF FAR

f. Parking Requirement

Parking requirement is the number of parking bays required for each use or facility provided within a development. Parking requirement is usually expressed as the number of parking bays to be provided per building floor area (m²) covered by the use or facility. Parking to floor area ratios are calculated based on the amount of traffic generated by specific uses or facilities.

4.2.2.2. CREATION OF DENSITY BONUSES

Bonus density programs offer municipalities a tool to encourage development that furthers specific public policy goals. Many factors go into the creation of density bonus programmes and local governments should exercise care and prudence in developing these tools. There are five basic steps for creating density bonuses:

a. Define the purpose for providing density bonuses

Goals and objectives should be formulated to help define the purpose of a density bonus program, e.g. encourage land use and transportation integration or provide affordable housing in higher-income residential areas.

b. Identify the area where density bonuses are allowed

Areas should be identified that meet the density bonus program goals and objectives. For example, if the purpose is to increase density near public transit, then transit corridors should be identified. Identified areas must be clearly demarcated and mapped to avoid misinterpretation or abuse of the system.

c. Develop specific policy for allowing bonuses

A written policy must complement every area identified and mapped. Policy language should identify allowable density increases (e.g. maximum FAR), as well as the requirements for bonus eligibility.

d. Develop procedures for evaluating applications

Procedures need to be developed for evaluating and approving density bonus application. This requires the designation of an officer or body to approve applications for developments that include density bonuses.

e. Make provision for enforcement

A legal agreement, be it a title deed registration or legal contract, need to be drafted that will ensure that the conditions for granting a developer a density bonus is met by the developer. Therefore, provision needs to be made for the enforcement of the agreement, be it through of fine or other measure.

4.2.2.3. ADMINISTRATION PROCESS

Density bonuses are usually included in zoning bylaws and are therefore administered through rezoning applications or township establishment applications. Of critical importance is the Site Development Plan. On the one hand, the Site Development Plan will enable the calculation of the density bonus. On the other hand, the site development plan needs to be reviewed to ensure that the granting of the density bonus does not have an adverse effect on adjacent properties and that the municipal services network capacity is available to serve these higher densities.

Apart from the Site Development Plan, a range of 'subjective' criteria can also be applied to assess the validity of providing a density bonus. However, it has to be stressed that a density bonus not be refused based on these 'subjective' criteria. These 'subjective' criteria can only be used to strengthen a application for a density bonus. Consideration of the following criteria should be given but need not be limited to these:

- Housing typology mix: The provision of a mix of housing types catering for households of varying incomes and sizes.
- Facilitation of mixed-use: Mixed-use and clustering, which tends to mix living, working, socializing environments, should be considered.
- Infill Development: Development which utilizes infill land parcels (without overburdening existing infrastructure) may be considered more eligible for density bonuses.
- Quality of Life: Projects that utilize design features to enhance the quality of life for residents and the larger neighborhood should be considered more eligible for density bonuses.

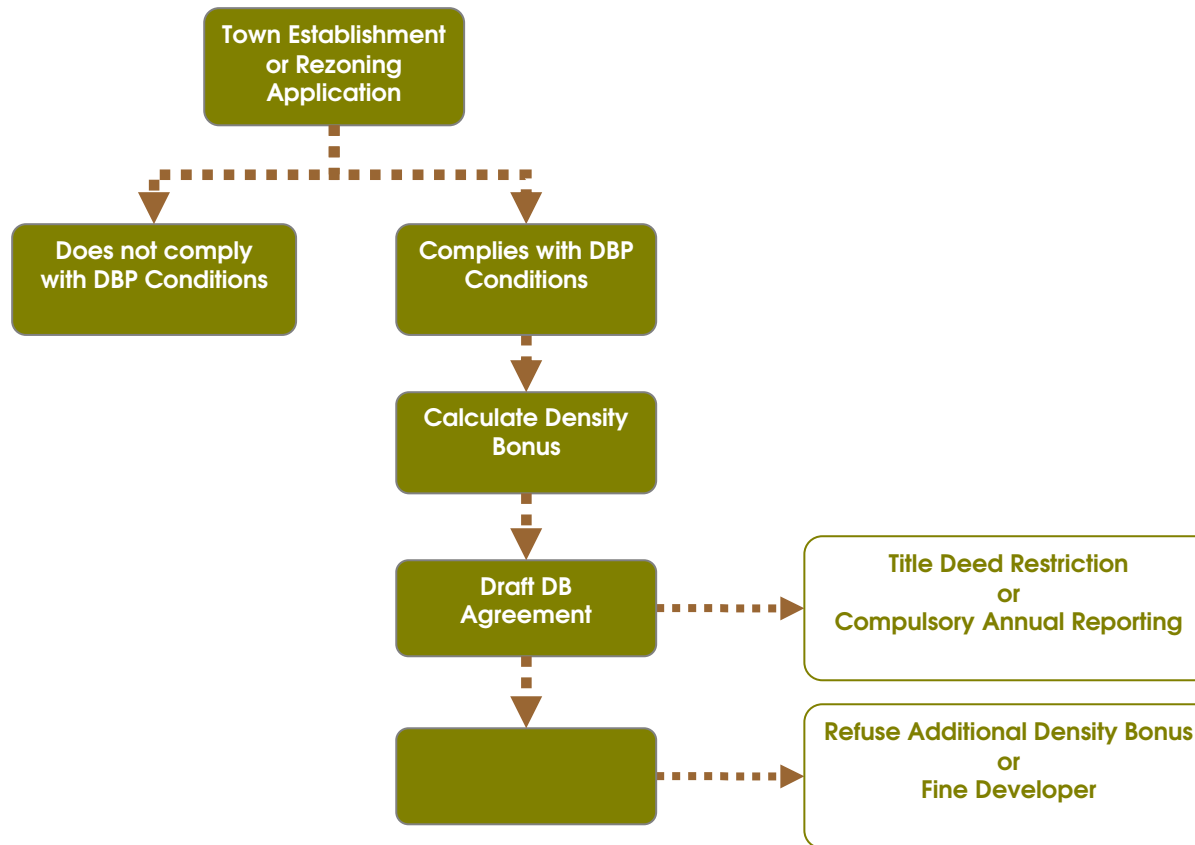


DIAGRAM: DENSITY BONUS APPLICATION PROGRESS

Once a density bonus has been granted, the Municipality will have to ensure compliance by the developer to implement the conditions of the density bonus. These conditions can be a once-off condition, such as constructing and selling affordable housing units at a pre-determined price. It can also be an ongoing condition, such as ensuring that a public facility developed and operated as part of the density bonus agreement remains in operation and open to the public for a pre-determined period of time. Ongoing agreements can be enforced by placing a deed restriction on the property or by requiring the developers to submit annual reports detailing, for example, the operation of a community facility over that period.

Penalties can also be used to enforce compliance. Without a penalty there is little incentive to continue to comply with the rules of the program. For example, the Municipality can refuse to allow the developer any future density bonuses or the Municipality can issue a fine for non-performance. Whatever mechanisms the Municipality develops, it should make sure the developer understands and agrees to the requirements prior to construction. This is best done through a legal agreement.

4.2.2.4. DENSITY CALCULATION

The Density Bonus calculations are structured in a very specific manner to achieve very specific land use goals and objectives along the Parktown-Sunninghill BRT route. Basically, the goal is to achieve a land use structure along the BRT route that will support the BRT system and ensure the optimal functioning of the BRT system. The objectives to implement this goal are as follows:

- a. To increase density in a responsible manner

The BRT system requires higher land use densities in order to function properly, as land use densities determine the number of commuter that are within walking distance of such a public transit system. However, there is a limit to the land use densities that such a system can accommodate, thus requiring that the densities be implemented selectively. Consequently, the Density Bonus calculations are structured to allow relatively high densities close to the BRT route, especially within nodal areas, while tapering off these densities further away from the BRT route.

- b. To create a land use mix with public goals in mind

Creating a land use mix along the BRT route is critical to the success of the BRT system for a number of reasons. Two reasons are of particular importance: (a) a land use mix along the entire route encourages a 2-way use of the system, as opposed to peak-hour demands, and (b) a land use mix provides a number of reasons for visiting an area or node. The Density Bonus calculations thus aim is to discourage the development of single land uses (such as retail or office space) and aims to encourage the inclusion of other uses into the mix, such as community facilities and housing.

c. To maximize pedestrian accessibility to the BRT system

Pedestrian accessibility is a key to the successful operation of a BRT system, because it is pedestrians who use public transport, as opposed to private vehicle users. The Density Bonus calculations are therefore designed to encourage pedestrian accessibility to the BRT route and to discourage private vehicle usage directly in the vicinity of BRT stations.

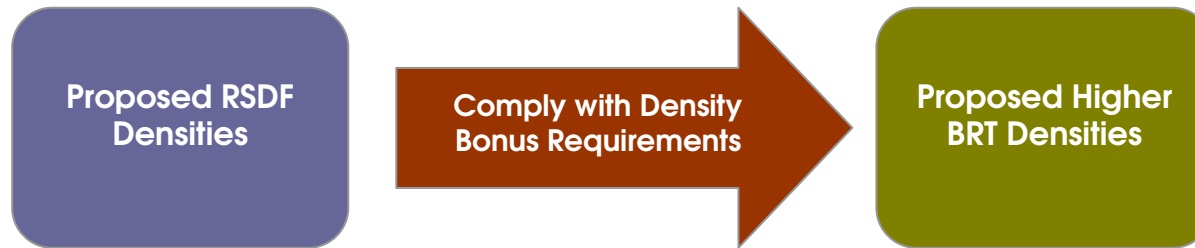


DIAGRAM: DENSITY INCENTIVE SCHEME

Section provides the maximum FAR, coverage and height proposed for the various Land Use Management Zones set out in this document. These are seen as the maximum densities that should be granted by the Municipality without a Density Bonus. In addition, compliance with the density bonus programme, can earn developers additional density (FAR) in certain Land Use Management Zones (see Diagram above). However, these additional densities need to be earned. Density bonus can be earned in the following ways:

- By developing medium-income flats as part of the development mix
- By developing low-income flats as part of the development mix
- By developing very-low-income flats as part of the development mix
- By developing public-access community facilities as part of the development mix
- By developing public-access pedestrian facilities on site
- By discouraging private vehicular traffic through the design and positioning of vehicle accesses

The Table below defines each of the above to ensure no uncertainty exists with regard to the requirement for earning a density bonus.

TABLE 4.2: DENSITY BONUS PROGRAMME

Category	Definition	Regional Mixed-Use Node		District Mixed-Use Node	
		Zone 1A High density mixed-use nodal core	Zone 1B Medium-density mixed-use node periphery	Zone 2A Medium density mixed-use nodal core	Zone 2B Low-density mixed-use nodal periphery
Middle income flats	Flats with a maximum unit selling price of R300000 (year 2007) with a inflation-related annual increase in the maximum unit selling price or rental units with a monthly rent that may not exceed 1% of the selling price for middle income units for a minimum period of 15 years	15% added to floor area if 10% of floor area is dedicated to medium-income units, with a 1.5% floor area increase for every percentage increase in floor area dedicated to medium-income units above 10% and;			
Low income flats	Flats with a maximum unit selling price of R200000 (year 2007) with a inflation-related annual increase in the maximum unit selling price or rental units with a monthly rent that may not exceed 1% of the selling price for low income units for a minimum period of 15 years	20% added to floor area if 10% of floor area is dedicated to low income units, with a 2.0% floor area increase for every percentage increase in floor area dedicated to low-income units above 10% and;			
Very-low income flats	Flats qualifying for and accessing the Housing Subsidy and Restructuring Grant within a Restructuring Zone. Zones 1A, 1B, 2A and 2B are considered Restructuring Zones. The maximum unit selling price may not exceed the combined subsidy and grant amount. The monthly rent of rental units may not exceed 1% of the maximum unit selling price for very low income units for a minimum period of 15 years	25% added to floor area if 10% of floor area is dedicated to very low income units, with a 2.5% floor area increase for every percentage increase in floor area dedicated to very low-income units above 10% and;			
Social facilities	Including a crèche, primary school, secondary school, tertiary education institution, clinic, day-hospital, hospital, community hall, library, post office, police station or emergency service centre open to the general public for a minimum period of 15 years.	10% added to floor area if 5% of floor area is dedicated to social facilities, with a 2% density increase for every percentage increase in floor area dedicated to social facilities above 5% and;			
Pedestrian facilities	Including a pedestrian thoroughfare on property, pedestrian mall on property, town square on property and minimum 2m street-front sidewalk on property all accessible to the general public for the life-span of the density bonus	0.5m ² added to floor area for every 1m ² dedicated to pedestrian facilities and;	0.5m ² added to floor area for every 2m ² dedicated to pedestrian facilities and;	0.5m ² added to floor area for every 2m ² dedicated to pedestrian facilities and;	0.5m ² added to floor area for every 3m ² dedicated to pedestrian facilities and;
Vehicle access	Use of a side vehicle entrance, shared vehicle access, service road access or park and ride facility for the life-span of the density bonus	10% added to building floor area for a side vehicle entrance or a shared vehicle access or a service road access and 2m ² added to floor area for every 1m ² dedicated to a park and ride facility to a;			
Maximum FAR of:		3.6	1.6	1.6	0.9
Maximum Coverage of:		60%	40%	40%	30%
Maximum Height of:		6 storeys	4 storeys	4 storeys	3 storeys
Parking reduction		1% parking reduction for every 0.1 FAR earned using density bonus			
Maximum parking reduction:		12%	4%	4%	3%

Source: Maluleke Luthuli and Associates, 2007

The Table above is designed as a user-friendly reference for the calculation of Density Bonuses. Density Bonuses are calculated for each Land Use Management Zone as set out in the Table above. Figure 4.1 Illustrates the Land Use Management Zones and must be read in conjunction with the Table above. Density bonuses available range from between 5% and 20% added to the FAR up to a maximum density bonus of for each Land Use Management Zone. Density Bonuses earned for a property must be added together, not exceeding the maximum allowable FAR under the Density Bonus Programme. If the total Density Bonus includes a fraction, a fraction of 0.5 or more must be rounded up to the next higher whole number, and a fraction of less than 0.5 must be rounded down to the next lower whole number.

HOW TO CALCULATE DENSITY BONUS AND PARKING REDUCTION
<p>To calculate FAR:</p> <ul style="list-style-type: none"> • Divide the building floor area by the total area of the property. <p>To calculate Density Bonus:</p> <ul style="list-style-type: none"> • Add density bonus percentages earned to obtain total density bonus percentage. • Multiply standard FAR with the total area of the property to obtain standard building floor area. • Multiply standard building floor area with total density bonus percentage to obtain building floor area earned. • Add building floor area earned with standard building floor area to obtain new building floor area. • Divide the new building floor area by the total area of the property to obtain new FAR. • New FAR may not exceed FAR limit set by density bonus programme. <p>To calculate Parking Reduction:</p> <ul style="list-style-type: none"> • Subtract new FAR from standard FAR to obtain FAR earned. • Multiply FAR earned by 10 to obtain the percentage parking reduction earned. • Multiply parking requirement with percentage parking reduction earned to obtain number of parking bays to be reduced.

The Density Bonus Program provides an additional parking reduction incentive, as set out in the Table above. The parking reductions are automatically earned through the earning of density bonuses, thus not requiring specific conditions to be met to earn such parking reductions. In addition, no guest parking is required for parking units created through the Density Bonus Programme. Any fractional parking space is rounded up to 1 whole parking space.

The Density Bonus Programme specifically aims to promote the inclusion of low to very low-income housing in the land use mix of developments along the BRT route. Such inclusionary housing units can either be sold by the developer or can be rented out by the developer. Consequently, such inclusionary housing units are defined by its selling price or by its rental price. Price limits for selling, reselling or renting inclusionary housing units to earn Density Bonuses are defined in the Table above. Note that reference made to 'selling price' in the Table above always refers to the maximum selling price as defined by the Density Bonus Programme in the Table above. Low and very low income dwelling unit maximum selling prices must be escalated by the annual South African inflation rate of the previous year to ensure the maximum selling price, as defined in the Density Bonus Programme, remains market related.

4.2.2.5. CONDITIONS FOR GRANTING OF THE DENSITY BONUS

The following **general** standards shall apply to the granting of the density bonuses:

- That the increased density and incentive will not cause significant adverse effects on the character of the surrounding neighborhood or public health and safety.
- That there will be no adverse traffic, noise, parking, or other impacts resulting from the density bonus or incentive.
- That the design and construction of the conditions for the granting of the density bonus or incentive comply with all of the requirements and standards set by the Municipality.
- That, prior to issuance of any building permit for the development, there will exist an enforceable recorded agreement to ensure the implementation and maintenance of the conditions for the granting of the density bonus or incentive.
- That the overall development will be of a quality that will preserve and uphold the integrity of the existing neighborhood.
- The terms and conditions of the Density Bonus Agreement shall run with the land/ property and will be binding upon any successive owner of the land/ property.

The following **Inclusionary Housing** standards shall apply to the granting of the density bonuses:

- The developer shall agree in an enforceable recorded agreement that all inclusionary housing units are sold and rented as defined in the Density Bonus Programme.

- Should rental units be soled, these rental units must be sold for no more than the maximum selling price as specified under the Density Bonus Programme for such a unit.
- ***Inclusionary housing units created under the Density Bonus Programme shall not be resold for more than the maximum selling price for such a housing unit as specified under the Density Bonus Programme.***
- The inclusionary housing units shall be integrated with other housing units in the development with regard to placement within buildings, and shall not significantly differ in exterior appearance from the other housing units.
- In no event shall the affordable housing units be located in only one portion of the housing development or situated in one building of a multi-building development.

The following ***community facilities*** standards shall apply to the granting of the density bonuses:

- The percentage of the building floor area allocated under the Density Bonus Programme for a community facility shall only be used for such a community facility or remain vacant.
- The building floor area allocated for a community facility shall remain accessible to the public, even if vacant.
- The Municipality shall not be required to provide a density bonus or incentive for a specific community facility if it finds, based upon substantial evidence, that the neighbourhood has an adequate number of this community facilities.
- A community facility operated by the developer shall require the developer to submit to the Municipality annual report on the operation of the facility

The following ***pedestrian facilities and vehicle access*** standards shall apply to the granting of the density bonuses:

- Pedestrian facilities provided under the Density Bonus Programme shall not be demolished or altered without the written permission by the Municipality.
- These pedestrian facilities shall continuously be maintained and can be upgraded with the written permission of the Municipality.
- The building floor area allocated under the Density Bonus Programme for pedestrian facilities shall remain accessible to the public.
- Vehicle access provided as defined under the Density Bonus Programme shall remain in place for the duration of the life the building and can only be altered with a written permission by the Municipality.

4.2.2.6. AFFORDABLE HOUSING DENSITY BONUS AGREEMENT

The conditions for earning a Density Bonus are best included in the title deed of the property and/or included in a legal agreement between the Municipality and the property developer/ owner. With regard to the later, the developer/ owner must enter into a written agreement with the Municipality, prior to the issuance of a building permit for a development for which a density bonus has been awarded or incentives have been granted. The terms and conditions of the agreement must run with the land/ property to be developed. In other words, the agreement must be binding on any successive owner of the land/ property. The agreement must be recorded and must be approved by the City Attorney and must include provisions for the following:

- The conditions for the granting of the Density Bonus.
- Deed restrictions binding on the property.
- Project phasing, including the timing of the completion of the conditions for the granting of the Density Bonus.
- Enforcement mechanisms to ensure that the conditions for the granting of the Density Bonus are implemented and maintained.

4.3. PARKING PROVISION

The level of parking provision within an area or node directly impacts on the use of public transport within that particular area or node. For example, providing ample parking within a node encourages the use of private vehicles to access that node, and consequently discourages the use of public transport within that node. By contrast, limiting parking provision within a node increases traffic congestion within a node, making the use of public transport more attractive. The following section attempts to provide some guidelines in the provision of parking, in particular with regard to parking provision in nodal areas.

4.3.1. GENERAL PARKING GUIDELINES

Some general principles guiding the development of parking are:

- In areas where accessibility is good, parking ratios should be reduced. The accessibility of the development is assessed taking into consideration accessibility to pedestrian links, cycle links, public transport and park-and-ride facilities.
- In areas with high pedestrian flows, on street parking should be provided only when there is enough road reserve.
- Where practically possible, multiple-use of available parking facilities should be encouraged, e.g. parking facilities of an office block could be used for theatre parking in the evening, or adjacent sport complex parking facilities could be used for office block during weekdays.
- The identification of appropriate sites for park and rides should be done within the context of the broader land development proposals of an area.
- In built up areas there should be parking bays reserved for emergency vehicles at all times and must be marked clearly.
- Parking areas for people with disabilities should be allocated and clearly marked.
- Bicycle-parking facilities should be provided at schools, shopping centres, community centres and sport complexes.
- Combating the loss of mobility and growing costs of increasing road congestion is a major challenge for cities. Cities can consider using some form of congestion pricing to address the problem of increasing car usage.
- Instead of using uniform parking fees, different rates could be charged depending on goals of the city for a particular area. Areas with high demand for parking, higher rates could be charged to induce parking turnover. On areas with low demand or those that are targeted for urban renewal, lower fees could be charged to encourage business to invest in the area. In some of the areas parking could be free.
- Holistic approach is needed when solving parking problems, should there be a need to restrict parking. This should go with improvements of pedestrian and cyclist facilities and the improvement of the safety, crime and cleanliness of an area.
- Large employers in the city should be encouraged to introduce car pools or dedicated transport services where viable. Incentives could be used to encourage employers to do this.
- Car use and parking cost should not be cheaper than using public transport anywhere in the city.
- Where park-and-ride facilities are used, transport to the CBD can be provided at a reduced cost to encourage motorists to leave their vehicles at designated facilities

4.3.2. PARKING AND NODAL DEVELOPMENT

The provision of parking should be done in the context of the development of a node as a whole. In particular, this should happen at a detailed level during precinct planning. District nodes will normally have on-street parking, although in some instances they may have off-street parking as well depending on the nature of developments and land uses in a particular

node. Regional nodes would normally have on-site parking. There are different nodal scenarios, which require different forms of intervention with regard to parking provision.

- **Proposed Node:** The impact that parking will have on the node should be addressed as part of the traffic impact study. During planning, provision should be made to accommodate future growth in the node. Where the initial stage of nodal development planning allows for private car-based transport with ample parking, proactive planning must be undertaken to introduce public transport as the backbone of the system. The design of the parking area should be flexible enough to shift from a car-based system to a public transport based system in future, or a combination of the two. This means that where previously the parking area was purely for private cars, it can be converted to a multi-modal facility with a feeder system supporting the node as well as public transport.
- **Emerging Node:** In instances where the node is rapidly growing, there tends to be a high demand for as many parking spaces as possible to attract customers, since parking and easy access are some of the main factors that draw tenants and customers. If good public transport is not immediately available as an alternative means to commute, the maximum threshold for parking should not be imposed in the node. There should still be provision for public transport to facilitate high public utilisation and thereby strengthen the vibrancy of the node.
- **Mature Node:** In a fully functional and mature node, the provision of parking spaces should from time to time be reviewed to ascertain whether it should be reduced or improved to assist with the optimal utilisation of public transport or to promote growth.
- **Stagnant or Declining Node:** Parking provision should, as far as possible, be reduced and densities increased so that population thresholds can be created for public transport which can stimulate re-development and revival of the node. Private sector developers need to indicate how public transport will be catered for in such developments.