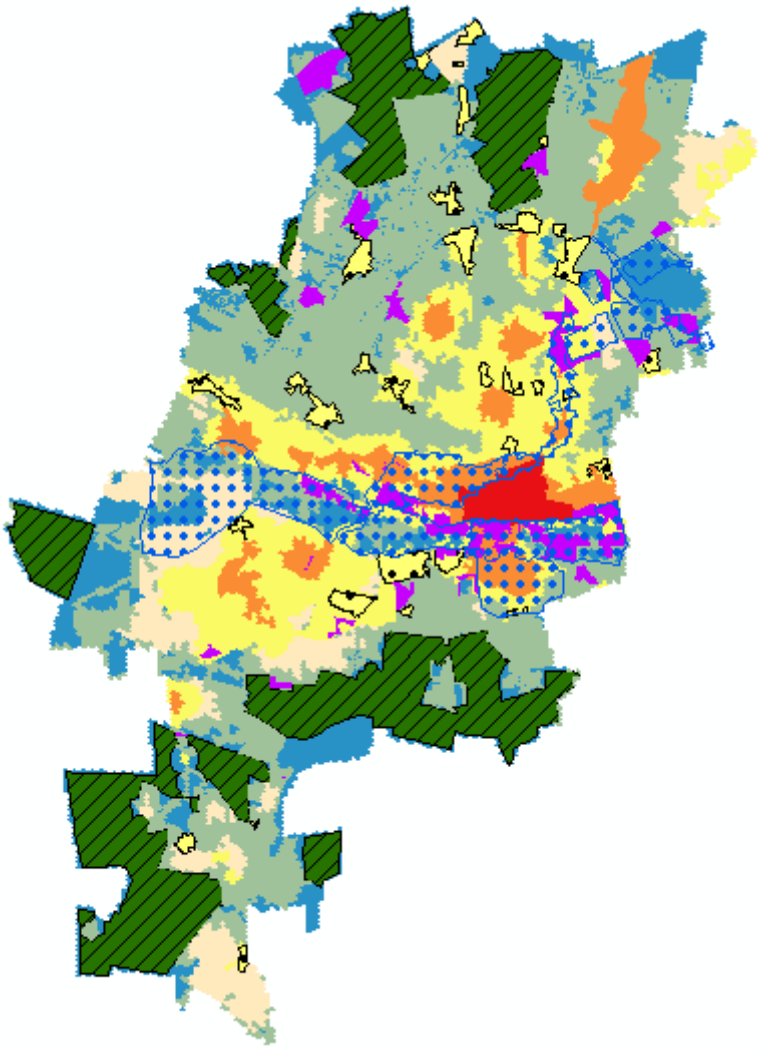
NODAL REVIEW POLICY 2019/20

City of Johannesburg



City Transformation and Spatial Planning
February 2020

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1. Introduction

The Spatial Development Framework 2040 (City of Johannesburg, 2016) and the SDFs that preceded it use a number of tools to direct urban growth and development. These tools ensure that development occurs in a way that is holistically sustainable: having positive environmental, social and economic effects. According to the SDF, development should be directed in a way that addresses the inequality and inefficiency in the City, transforming it into a more equitable, liveable, resilient, efficient and productive urban form. Additionally, private investment should be directed to match government capital investment, promoting a mutually beneficial multiplier effect.

Since the early 2000s, the City's strategy for urban growth management can broadly be described as one of 'compaction'. As the name suggests this promotes higher density, mixed use development in well located parts of the City, in place of outward sprawl (spreading the footprint of the city). Compact development allows for people to live close to where they work and go to school, makes public transit such as BRT viable, reduces the cost of providing infrastructure and other services, reduces pressure on the natural environment, and through agglomeration and clustering, promotes economic growth.

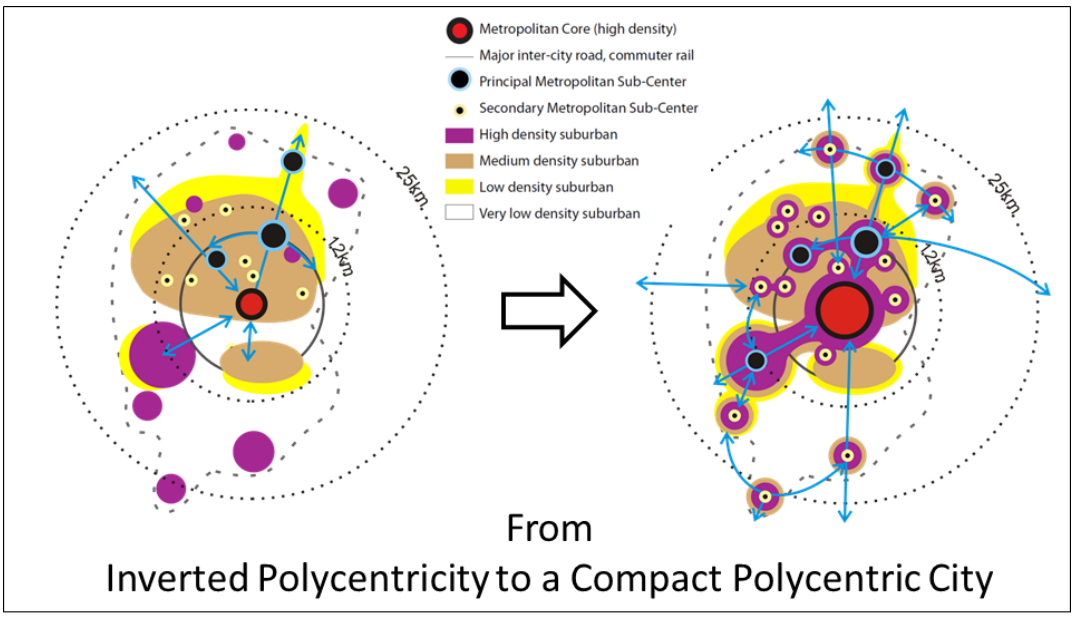

Figure 1: Spatial Transformation Model from the SDF 2040

For this plan to work high intensity development should be concentrated in clearly defined 'well located' areas. These areas are a key tool of the SDF and its predecessors where they are described as nodes, or mixed-use nodes. These nodes may differ from one another (for example some need more housing while others may need more business), but essentially, they are areas where high intensity and mixed-use development (supported by government infrastructure investment) should take place.

1.1. Why a Nodal Review?

In 2016, the Spatial Development Framework 2040 for Johannesburg was approved. That document, and the council minutes which adopted it, called for this Nodal Review to be drafted.

The nodes that are currently being used in the SDF 2040 are the same as those used in the 2010/11 SDF, various Regional Spatial Development Frameworks (RSDFs) from 2010/11, and subsequent Precinct Plans and Urban Development Frameworks. While it was initially intended that nodes be reviewed in the SDF 2040, it was decided that a dedicated process should rather take place following the adoption of the SDF, as outlined in the excerpt below.

> *"This SDF does not include new alterations of any nodes (district, specialist, metropolitan, local or industrial), which remain the same as the most recent boundaries approved by council… The SDF process will be followed by a Nodal Review process, in which nodal boundary changes and additions will be considered. This process will include an urban potential modelling exercise, and public participation on nodal additions and/or amendments." (City of Johannesburg, 2016, pp. 24-25)*

As such, this document reviews the nodes of the City, aiming to:

- Reflect the policy intentions of the SDF 2040
- Reflect the intentions of SPLUMA
- Respond to current realities in the CoJ
- Have a strong foundation in evidence-based planning
- Respond to changes that have taken place since the previous nodal delineation
- Address limitations of the previous nodal definitions

This document outlines the process that was followed in reviewing the nodes in the city, and describes a new 'transect' or 'node and development zone' approach which is an evolution of the nodal strategy. It then indicates the development guidelines that should be applied in each of the nodes/development zones of the city.

The following section describes how this Nodal Review relates to current spatial policies in the city.

1.2. Guiding Principles of the Nodal Review

This Nodal Review is based on the guiding principles of SPLUMA and the SDF 2040. The principles are outlined here, but the full versions of each document are available online.[1]

1.2.1. Spatial Planning and Land Use Management Act (SPLUMA)

The Spatial Planning and Land Use Management Act, 2013 (SPLUMA) came into effect on 01 July 2015. It is a framework act for all spatial planning and land use management legislation in South Africa. The legislation seeks to promote consistency and uniformity in procedures and decision-making related to the spatial planning environment across the country, and across all spheres of government.

SPLUMA reinforces and unifies the NDP's vision and policies in respect of using spatial planning mechanisms to tackle poverty and inequality while creating conditions for inclusive growth by fostering a high-employment economy that delivers on social and spatial cohesion.

The five development principles, as set out in Section 7 (a) to (e) of SPLUMA are summarised as:

- **Spatial justice**: past spatial and other development imbalances must be redressed through improved access to and use of land.
- **Spatial sustainability**: spatial planning and land use management systems must promote the principles of socio-economic and environmental sustainability.
- **Efficiency**: land development must optimise the use of existing resources and the accompanying infrastructure.
- **Spatial resilience**: securing communities and livelihoods from spatial dimensions of socio-economic and environmental shocks through mitigation and adaptability that is accommodated by flexibility in spatial plans, policies and land use management systems.
- **Good administration**: all spheres of government must ensure an integrated approach to land use and land development and all departments must provide their sector inputs and comply with prescribed requirements during the preparation or amendment of SDFs.

1.2.2. Spatial Development Framework 2040

The SDF 2040 is referenced throughout this document, however it does outline a set of core principles, based on SPLUMA and other guiding documents. The document reads:

"To facilitate the spatial transformation needed in the city, the SDF 2040 endorses the following intertwined concepts of the new image of Johannesburg:

[1] SPLUMA: http://bit.ly/spluma - SDF 2040: http://bit.ly/cojcitywide

- **Compact city –** combining density, diversity, proximity and accessibility, reducing distances, travel times and costs, bringing jobs and social amenities to single use, marginalised residential areas, reducing energy consumption and infrastructure costs.
- **Inclusive city –** ensuring balanced service provision (hard and soft) and opportunities for all by diversifying land uses, promoting social mixing and bridging social, spatial and economic barriers.
- **Connected city** –enhancing public transit and ICT infrastructure at provincial and urban scales to re-connect the city, starting from 'the Corridors of Freedom' to street and neighbourhood-level connectivity.
- **Resilient city –** building a metropolitan open space system as a protection buffer, preserving valuable green infrastructure and areas of high agricultural potential, promoting sustainable energy use, reinforcing the urban development boundary and protecting biodiversity resources.
- **Generative city –** focusing investment in transformation areas and nodes towards: achieving positive social, economic and environmental returns on investment; spurring economic growth and job creation and enhancing public space and promoting sustainability (social, environmental and economic)." (City of Johannesburg, 2016, p. 14)

1.3. Applying this Nodal Review in relation to existing spatial policies

This policy, once approved by Council, will form part of the SDF 2040 as an annexure. All nodes defined in the SDF 2040 or any existing RSDF, Precinct Plan or Urban Development Framework, will be replaced by the nodes and urban development zones defined in this document. This section defines how existing approved spatial policies should be applied in relation to the Nodal Review.

As a general principle and as per the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) (see excerpts in Figure 2 & Figure 3 below) the SDF 2040 remains the overarching land use policy for the City of Johannesburg. Where the provisions of older policies are contrary to the ideals and guidelines of the SDF 2040, the SDF should override those policies. This relates to all land use and development control decisions.

Part F

Status of spatial development frameworks

Status of spatial development frameworks

22. (1) A Municipal Planning Tribunal or any other authority required or mandated to make a land development decision in terms of this Act or any other law relating to land development, may not make a decision which is inconsistent with a municipal spatial development framework.

(2) Subject to section 42, a Municipal Planning Tribunal or any other authority required or mandated to make a land development decision, may depart from the provisions of a municipal spatial development framework only if site-specific circumstances justify a departure from the provisions of such municipal spatial development framework.

Figure 2: Status of Spatial Development Frameworks (SPLUMA, section 22. pg. 34)

Deciding an application

42. (1) In considering and deciding an application a Municipal Planning Tribunal must—

(a) be guided by the development principles set out in Chapter 2;

(b) make a decision which is consistent with norms and standards, measures designed to protect and promote the sustainable use of agricultural land, national and provincial government policies and the municipal spatial development framework; and

(c) take into account—

(i) the public interest;

(ii) the constitutional transformation imperatives and the related duties of the State;

(iii) the facts and circumstances relevant to the application;

(iv) the respective rights and obligations of all those affected;

(v) the state and impact of engineering services, social infrastructure and open space requirements; and

(vi) any factors that may be prescribed, including timeframes for making decisions.

(2) When considering an application affecting the environment, a Municipal Planning Tribunal must ensure compliance with environmental legislation.

(3) An application may be approved in whole or in part, or rejected.

Figure 3: Deciding an application (SPLUMA, section 42. pg. 50)

The sub-sections immediately below outline how specific policies are to be read in relation to this Nodal Review.

1.3.1. Strategic Area Frameworks

Guidelines from any Council Approved Strategic Area Framework (SAF) remain in place (subject to sections 22 and 42 of SPLUMA outlined in Figure 2 & Figure 3 above) until rescinded by Council or replaced by another Council approved spatial policy.

1.3.2. Urban Development Frameworks and Precinct Plans

As a new general principle, Council approved Urban Development Frameworks (UDFs) and Precinct Plans (PPs) will be valid for a period of five (5)[2] years from the date of approval, after which they will be automatically rescinded, subject to the following:

a) This provision will only come into effect 180 days[3] from the adoption of the Nodal Review.
b) When a Precinct Plan or Urban Development Framework is coming to the end of its 5 year validity, or during the 180 day period mentioned immediately above, City Transformation and Spatial Planning (through their own initiative, or through an application by an interested and affected party) may assess the policy, and make a recommendation to Council as to whether it should be renewed (endorsed for 5 year renewal, as is), reviewed (renewed with amendments), re-formulated (replaced with a new policy) or if no recommendation is made, rescinded.
c) Applications from interested or affected parties to renew, review or re-formulate an urban Development Framework or Precinct Plan, must be submitted to City Transformation and Spatial Planning within the 180 day period mentioned above, or at least 180 days before a policy is due to reach its 5 year expiry date.
d) Renewal: If City Transformation and Spatial Planning deems a Precinct Plan or Urban Development Framework still valid and in line with the SDF and relevant legislation, it may recommend that that plan be renewed for a period of 5 years by Council. This would be done through a report to Council for approval. If such a process is in place, the policy will remain valid until a decision on the matter has been made by Council.
e) Review: If City Transformation and Spatial Planning deems a Precinct Plan or Urban Development Framework to be mostly valid, and mostly in line with the SDF and relevant legislation, it may recommend that the policy be renewed for 5 years, with amendments. This would be achieved through a report to Council for approval, accompanied by the re-formulated policy. If such a process is in place, 180 days will be given for amendments to be made and submitted to City Transformation and Spatial Planning. If this timeframe is achieved, the policy will remain valid until a decision on the matter has been made by Council.

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[2] This timeline is derived from SPLUMA timeframes, in sections 13, 15, 18 and 20. This is despite the fact that no specific time is given, in SPLUMA (section 20), as to how often Municipal SDF's must be reviewed.

[3] Calendar days, giving 6 months

f) Re-formulation: If City Transformation and Spatial Planning deems a Precinct Plan or Urban Development Framework to be mostly invalid, and mostly not in line with the SDF and relevant legislation, it may recommend that the policy be re-formulated as per the directorate's Precinct Plan and Urban Development Framework guidelines. This would be done through a report to Council for approval, accompanied by the re-formulated policy. When such a process is initiated, the existing precinct plan or urban development Framework would be rescinded after its 5-year lifespan and replaced when the new policy is adopted.

g) Any guidelines from rescinded urban development frameworks or precinct plans will be replaced by those from the SDF 2040 and this Nodal Review, or other relevant policy as per this section 1.3.

1.3.1. SDF 2040 Densities Table

Densities indicated in the SDF 2040 will remain in place and applied to the new nodal and development zone boundaries defined in this document. Table 10 on pg. 51 indicates how the densities table from the SDF 2040 should be applied to new nodes and development zones defined in this document.

References to walking distance from nodes in the SDF 2040 (specifically within 500m walking distance of the CBD, 100m from Metropolitan /Regional Nodes, and 100m of District Specialist nodes) fall away, as in some cases nodes have been extended, and densities have been defined in this document (see section 4) for all parts of the city.

1.3.2. Urban Development Boundary

Two Changes are made to the Urban Development Boundary. First is to accommodate the approved layout of Steyn City, specifically the proclaimed and/or proposed townships Riverside View 46 to 53, 72 to 75 and 79. Second is to allow for the extension of the Anchorville industrial node (near Lenasia) southwards towards the Lawley train station. This is to accommodate existing approved commercial 1 properties that were outside the boundary (before this change), and to allow for much needed economic development in the region. The list of properties that have been removed from "beyond the UDB" are shown in Annexure 5: Anchorville Properties on pg. 61.

Besides these, one council resolution has been approved since the adoption of the SDF 2040 to amend the UDB, to move the boundary to allow for the in-situ upgrade of Dark City Informal Settlement, Poortjie.

The Urban Development Boundary depicted in this document is the official up to date shape at the time of approval.

1.3.3. Existing Neighbourhood Nodes

Neighbourhood nodes defined in a Council approved spatial policy that has not yet been rescinded shall be classified as “General Urban Zone” as per section 0 of this document. Such a neighbourhood node must have defined boundaries and, when used to make an argument for land use applications, should include a map, and verifiable references to the council approved source document.

1.3.4. Industrial Nodes

Industrial Nodes remain unchanged from the SDF 2040. When considering rezoning from industrial to other land uses, careful consideration must be made of whether the proposed land use is appropriate in the specific location and be cognisant of maintaining the jobs and economic activity that industrial land uses provide. Guidelines for industrial nodes should be obtained from the SDF 2040 or the relevant spatial policy that they fall into.

1.3.5. Inclusionary Housing

While the City was developing this Nodal Review, Inclusionary Housing Incentives, Regulations and Mechanisms were being formulated. The Nodal Review (and all spatial policies in the city) should be read in conjunction with the Inclusionary Housing Incentives, Regulations and Mechanisms, when approved. The Nodal Review (and other relevant spatial policies) determine the allowable development controls and land use on a site, and then inclusionary housing bonuses (where relevant) are applied over and above those controls.

2. Developing the Nodal Review

The Nodal Review process has taken place in two broad parts: technical analysis/modelling and public participation. The modelling exercise was used to define the areas of greatest potential in the City for high intensity urban development forming the evidence-based planning component. The public participation aspect has taken place throughout the project. It has been used to source ideas and proposals from the public, and as a means to participate in the debates around results and proposals. The two parts are outlined below.

2.1. Public Participation

The process of public participation started with a call for inputs circulated on the 7th of October 2016, with a deadline for submissions on the 11th of December 2016. The call was widely circulated, and it was requested that recipients circulate it as widely as possible. The call requested:

- *"Proposals for nodal extensions, reductions or re-classifications;*
- *Proposals for new nodes;*
- *Proposals on how nodes should be defined and how the nodal policy should work;"*

Some 80 inputs were received from interested parties including (to name a few) developers, planning consultants, GDARD, heritage organisations, environmental groups, residents associations, and CoJ departments. These inputs were collated in two ways. Firstly, a Geographic Information Systems (GIS) map was compiled including proposals for node extensions, reductions and new nodes. This map was then compared with the results of the modelling exercise (described below). Secondly, written inputs were analysed and collated into themes that gave guidance to the approach taken in the Nodal Review process. This required careful consideration to ensure that the comments incorporated are in line with the ideals of the SDF 2040 and SPLUMA and are in the general interest of the residents of the city.

Secondly, during July and August 2017, public participation sessions were held in each of the City's regions. At these meetings, the draft urban potential model and Nodal Review was presented, and inputs received.

Following this, internal participation was held in the City of Johannesburg, mainly with the Land Use Planning department. Additionally, throughout the process, meetings have been held with individuals/groups of interested parties, upon request by those parties.

Once the draft was advertised for public comment (28th of February 2018), another round of public participation sessions was held, where the process, maps, guidelines and implications were presented to the public in three sessions, where questions and comments were received.

Comments Received during the public participation process are summarised in Annexure 3: Summary of Public comments.

A summary of the public participation is attached as an annexure (Annexure 2: Summary of Public Participation).

2.2. Spatial Analysis: Urban Potential Modelling

Cities are largely founded on connectivity and access. They are places where people and businesses concentrate to gain access to a number of services and amenities. These include (to name a few); jobs, economic activity, markets, schools, healthcare facilities, services, cultural/religious experiences, leisure, entertainment and interaction with other people. The SDF argues that the city needs to transform from a sprawled, car-oriented city, to a compact-polycentric, mixed use, walkable city. Compact cities are argued to be more efficient, productive, liveable and sustainable and they also promote the use of public transit, rather than the private car. (Angel, Parent, Civco, & Blei, 2010) (Harrison, et al., 2014).

As such, along with the public participation component, the Nodal Review has largely been based on a modelling exercise that measures urban potential in the City, based on connectivity and access. This used current street networks and how they promote walkability, access to public transit stations, and various amenities. Importantly, it focussed on walkability and public transit, rather than car use.

The analysis created two indexes (one for commercial nodes, and the other for residential density) that score all parts of the City in terms of Urban Potential and Connectivity. Those areas that score highest inform the location of high intensity nodes, with those that score low indicating areas where development should be limited. Importantly too, it is intended that a gradient of intensity is created across the City. This is as per the SDF 2040, which calls for:

> *"a focus on the Inner City as the core node of Johannesburg, surrounded by mixed use nodes of various intensities connected by effective public transport and a more logical and efficient density gradient radiating outward from cores" (City of Johannesburg, 2016, p. 13).*

The urban potential model uses a sampling grid of 400m by 400m hexagons (easily walkable units) as a basis. This is to create a standard unit of analysis for land in the city because other shapes (wards, census boundaries, suburbs, erfs etc.) all differ significantly in size and shape and so are not comparable. Each hexagon was given a local walkability score based on the surrounding road network (1km walking distance). The wider the area one can reach on foot from the centre of each cell, the higher the walkability score, and more conducive that neighbourhood is to walking. An illustration of the road network walkability around four train stations in Johannesburg is show in Figure 4 below to show the importance of considering roads in such a model.

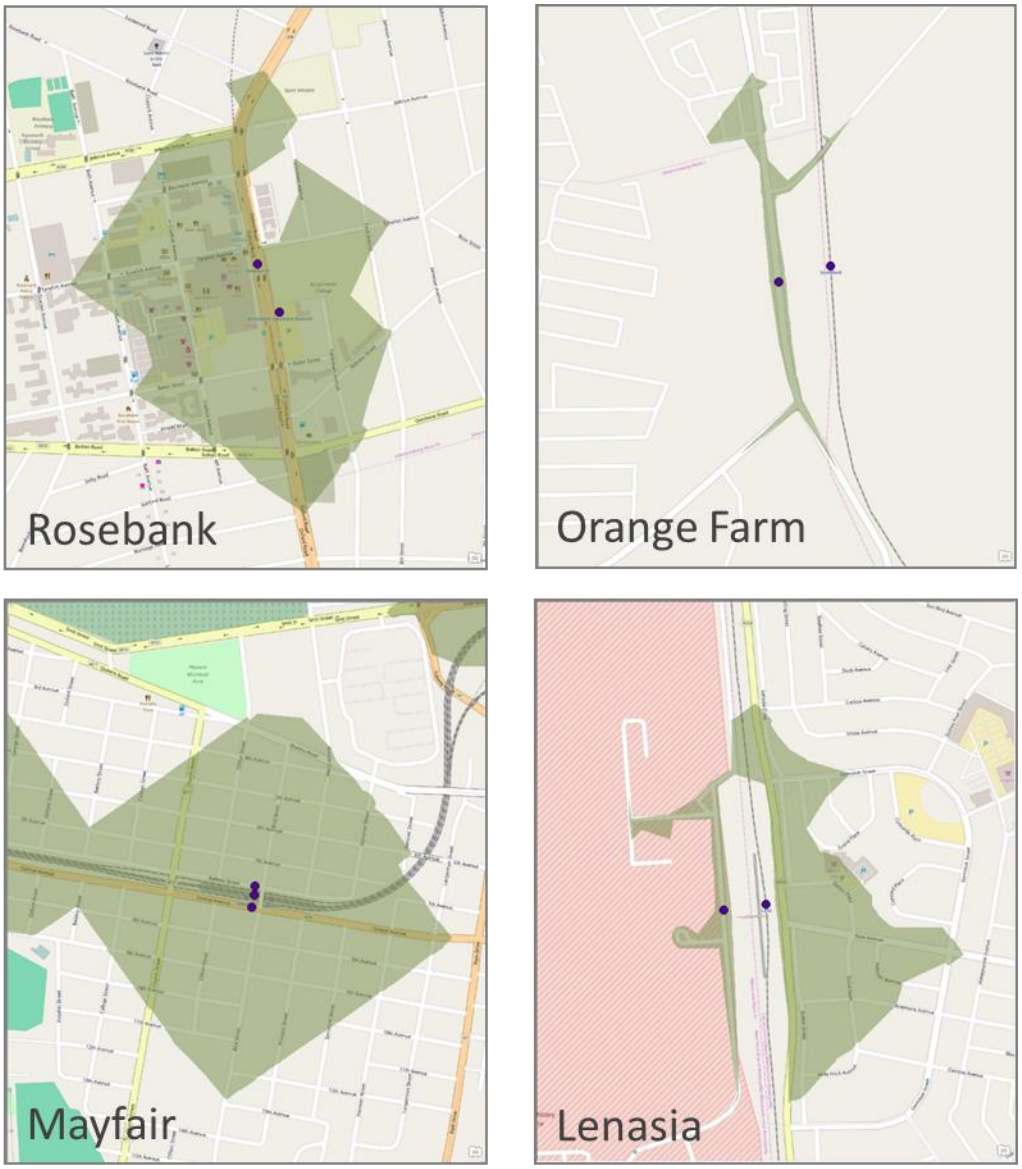


Figure 4: Comparative walkability of the road network around four rail stations (500m service areas) (Source: Own analysis)

Figure 4 shows how significant the road network is in terms of how walkable a neighbourhood is. A tight grid network (as with Mayfair) allows access on foot to a relatively large portion of the neighbourhood within a 500m walk. In Orange Farm on the other hand, with a disconnected road network, one can only reach a small area of the neighbourhood in 500m. This is important in the context of the SDF, which has a strong focus on developing walkable, mixed use neighbourhoods.

Added to the walkability score is the amenities that can be accessed within 2km walking distance[4] of each 400m hexagon, including:

- economic activity (the location of jobs and businesses)
- public transit (train and BRT stations)
- public open space
- social infrastructure (health and education facilities)
- capital projects of the City
- land use mix

Finally, once the index was created (using the data mentioned above), current nodes were compared to the model and public inputs, in order to define the nodes and development zones proposed in this document.

A detailed report of how indexes were calculated and all of the data used is attached as Annexure 4: Urban Potential Modelling Method pg. 60. This also includes how existing nodes were incorporated into the new nodes and development zone approach. The model used to make the calculations is also available for download at the following link: **www.bit.ly/nodal-council**

[4] 2km was used, as this provides a 30 minute commute (walking) time.

3. Nodes and Development Zones

This section outlines the revised nodes and the proposed new approach which includes urban development zones, rather than just nodes. It starts with a description and rationale of the 'transect' approach taken in this document. It then includes a map of the proposed zones, as well as a description of the development vision for each of the proposed nodes and development zones.

3.1. Transect Approach

The SDF 2040 uses the following model to describe the compact polycentric vision for Johannesburg.

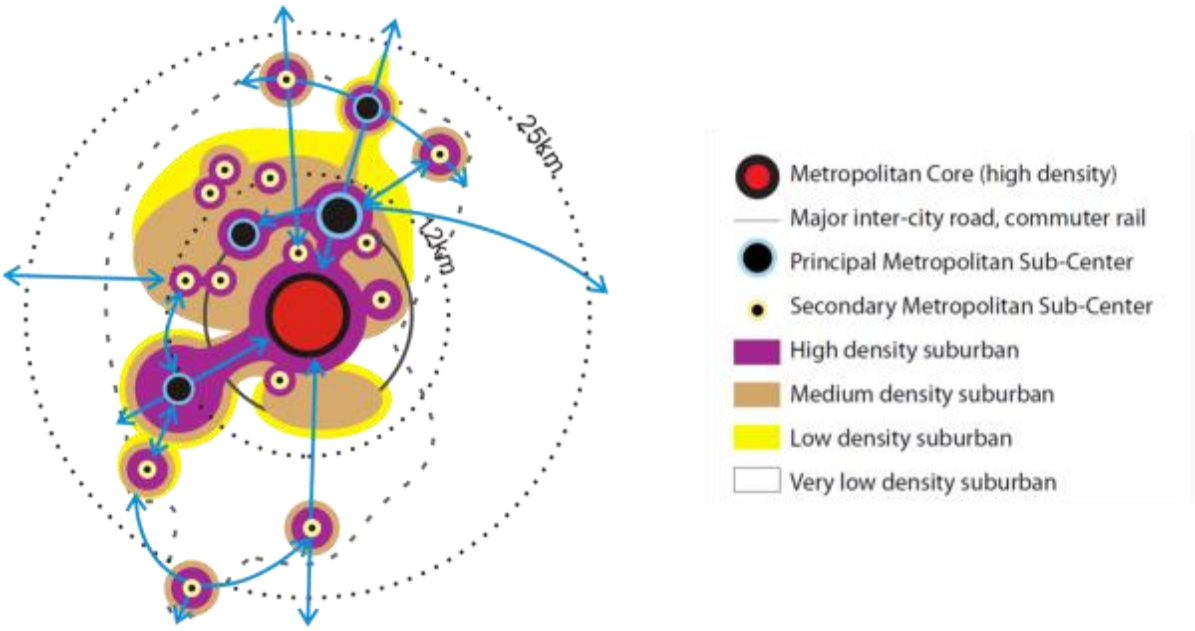


Figure 5: Johannesburg Future City Model: Compact Polycentric Urban Form

The document then describes the model thus:

> *"The future polycentric Johannesburg will bring jobs to residential areas and housing opportunities to job centres rather than merely transporting people between the two. It will create complete nodes where people can live work and play that are efficiently connected by public transport. It will bridge spatial and social barriers and build a framework for a spatially just city." (City of Johannesburg, 2016, p. 14)*

It goes on to say:

> *"The Compact Polycentric Urban model looks to adapt the current structural reality of the city into one that is more socially, environmentally and financially sustainable, efficient and equitable. The model seeks to create a well-connected (by public transit and other transport routes)*

> *series of dense metropolitan centres and sub-centres, each immediately surrounded by high density residential and mixed-use areas, with residential densities declining with distance from these nodes or centres. Densification should also occur along defined corridors, specifically the Corridors of Freedom and the Randburg – OR Tambo Corridor. The model looks to maximise the potential of the current nodal structure of the city, while addressing the spatial inequalities that exist." (City of Johannesburg, 2016, p. 70)*

While the SDF promotes densification and diversification in well located parts of the City (including nodes, transformation areas and around public transit) some current spatial policies (including RSDFs) arguably do not promote the same ideals. This is notable in two ways. The first is that nodes are generally surrounded by low intensity development areas, which are supported by some existing policies. This is contrary to the outcomes sought in the quotes above. It is often the case that well-located residential areas (surrounding nodes) are not the subject of intensification. This results in maintaining the status quo, rather than following the transformative agenda of the SDF. The second limitation is when high intensity residential development takes place (and is promoted by policy) on the outskirts of the city. This, rather than contributing towards transformation to a compact polycentric city, sprawls the city further, compounding the current inverted polycentric structure.

While historically the City has promoted a number of nodes for development, and an urban development boundary that limits development on the periphery, the vast area in between has arguably been inconsistently treated, where high densities are allowed on the outskirts, yet prevented in some well-located parts of the city.

For this reason, and in order to sharpen the tools of the SDF, this document proposes a move away from three development zones (transformation zone [including nodes], the urban development boundary and the rest) to a "transect approach". This is directly in line with the SDF, and seeks to create a logical density gradient in the city. The approach looks to limit peripheral growth while making more land available in core areas for higher intensity growth through ***re***-development.

The transect approach describes different nodes and development zones of the city, that vary in character ranging from high intensity urban cores to rural areas on the periphery (CATS, 2013). These zones promote high intensity, mixed use development in well located, walkable parts of the city with good access to public transit, and lower intensity urban form moving away from the centre. Two graphical depictions of urban transects are shown in the image below.

The approach allows for a more concrete application of the SDF 2040. This can be seen when comparing the compact polycentric model (Figure 5), with the actual proposed odes and development zones in the city (Figure 7).

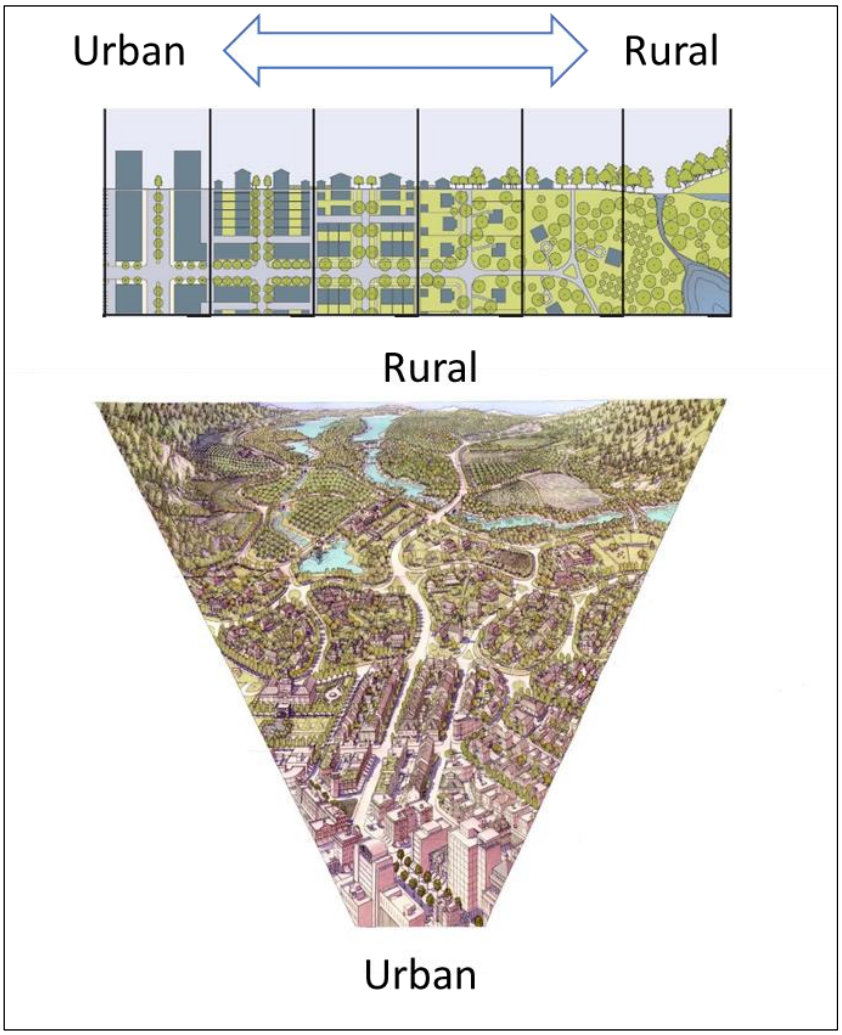


Figure 6: Graphical Examples of Urban Transects[5]

[5] After Duaney Plater-Zyberk & Company, https://transect.org/rural_img.html

3.2. Nodes and Development Zones

The nodes and development zones depicted in this document, relate to the transect approach described above, as well as direct goals from the SDF 2040. The nodes and development zones are shown in Figure 7 below, and more detailed maps are available for download at: **www.bit.ly/nodal-council**

There are seven broad nodes and zones defined, being:

- 1: Inner City Node
- 2: Metropolitan Nodes
- 3. Regional Nodes
- 4: General Urban Zone
- 4a: Local Economic Development (LED) Zone
- 5: Suburban Zone
- 6: Peri-urban Zone
- 7: Beyond the Urban Development Boundary

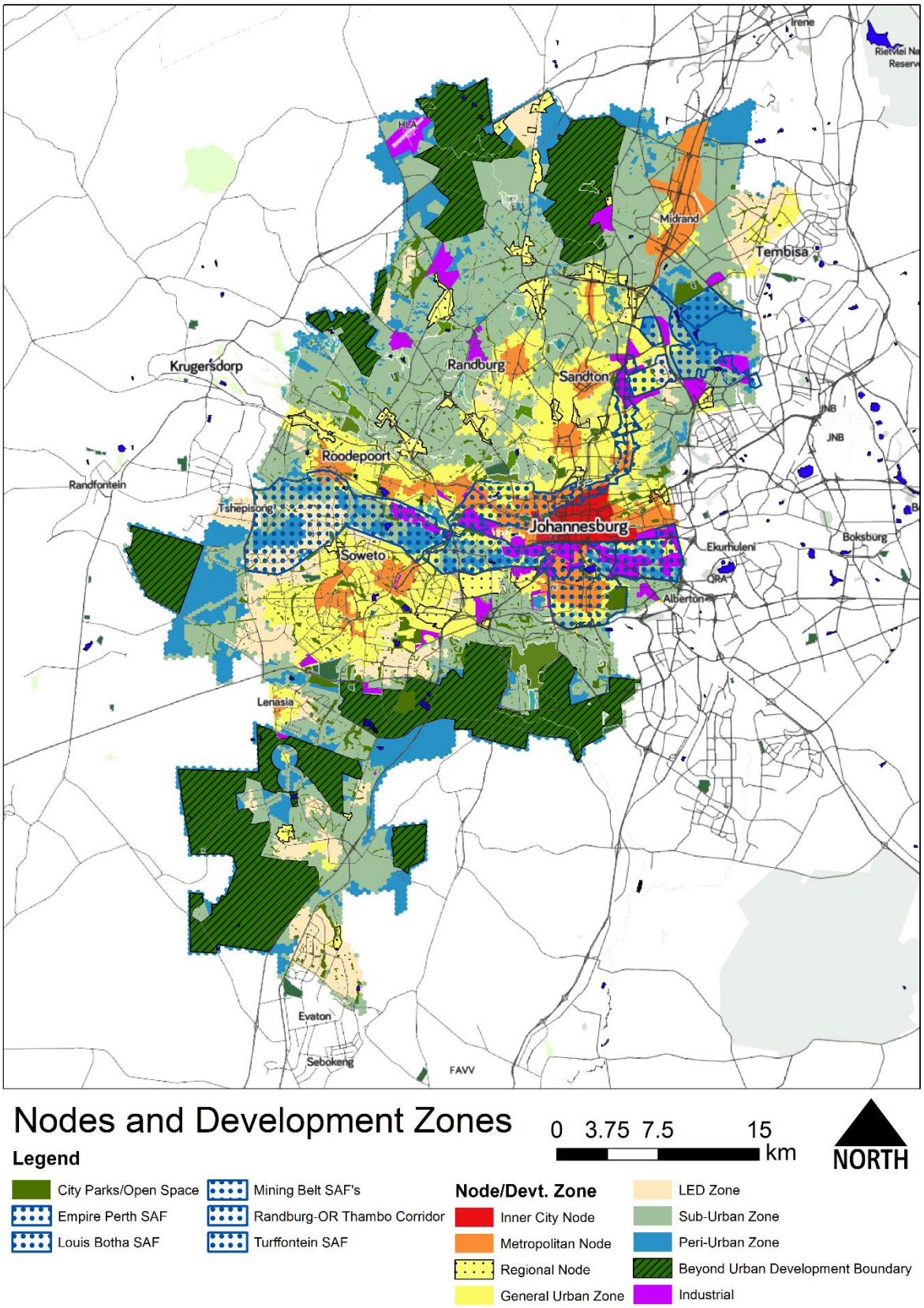


Figure 7: Nodes and Development Zones

3.1. Development Guidelines

This section details the development vision and guidelines for each of the nodes and development zones. It also includes detailed urban development guidelines that should be applied to development applications in the City.

3.1.1. General Considerations for Development Guidelines

a) Flexibility and Interpretation: Section 3.1.3 "Development Guideline Tables" provides guidelines that should be adhered to, but may be deviated from as per sections 22 and 42 of SPLUMA outlined in Figure 2 and Figure 3 above. Deviations must be motivated for and considered in terms of the guiding principles of the SDF 2040, and SPLUMA.

b) Erven Crossing nodal or development zone boundaries: This document defines nodes and development zones, but does not always distinguish them at an erf level. As such, sometimes an erf will straddle more than one node, or development zone. In these cases, the node/ development zone level at the main access point (along a street) to the erf shall be used. Also taken into account should be the majority node/ development zone that the subject erf falls into. Summarised, for development applications, consideration of the node/zone level at the access to each erf and the majority node/zone that the erf falls into shall be taken into account.

c) Inclusionary Housing: Where inclusionary housing is in place, and relevant development bonuses are applicable, these bonuses will be over and above the allowable controls as indicated in section 3.1 or other relevant spatial policy.

d) Height and Scaling Down: A policy that promotes densification (such as this one) inherently calls for increased height in priority development areas. A balance must be sought however, when making or assessing applications, between sensitively considering surrounding built form, while promoting the development intent of the SDF 2040 and Nodal Review. This concept is detailed in section 3.1.4 "Urban Design Considerations for all Nodes and Zones" and in the development tables in section 3.1.3.

3.1.2. Heritage, Environment and Infrastructure Capacity

Neither the SDF 2040 nor the Nodal Review, nor any other spatial policy will override any heritage or environmental policy or legislation, and all applications are subject to infrastructure availability (as per SPLUMA, section 42 - Figure 3). What this means, is that even if a spatial policy (such as this Nodal Review) indicates a future change in land use (for example densification) but there are heritage or environmental or infrastructure policies, laws or constraints that prevent that change in land use, then

the land use change should not be approved. When considering a land use application, the City must thus (as per SPLUMA, section 42) consider comments and decisions from the relevant infrastructure, heritage and environmental authorities.

Regarding infrastructure, it is common knowledge that backlogs exist in the City, and that infrastructure upgrades will be needed over time to allow for the City to develop as envisaged by the SDF 2040, and the Nodal Review. It is also acknowledged that it is impractical and unaffordable to deliver all of the required infrastructure at once, and thus it will have to be delivered incrementally. At the same time the City continues to grow and housing and other development backlogs persist, so development cannot be put on hold. Thus a balance has to be found where development and supporting infrastructure provision happen concurrently and incrementally over time. In line with SPLUMA, existing infrastructure capacity must be used to increase efficiency and, where needed, infrastructure must be upgraded to support the SDF 2040. In line with chapter 9 of the SDF 2040, the capital prioritisation system of the City (JSIP – Johannesburg Strategic Investment Platform) must be updated with shape files from the Nodal Review (in consultation with relevant departments and decision makers in the City) in order to prioritise infrastructure spend over time that will allow for the vision of the SDF 2040, and the Nodal Review to be sustainably met.

3.1.3. Development Guideline Tables

1: Inner City Node

Table 1: Inner City Node Development Guidelines

1: Inner City Node									
Character of the Node/Zone	**Land use Mix Guidelines**	**Inner City Node Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
CHARACTER & DEVELOPMENT INTENT: The primary mixed use/commercial Node of the City. Highest intensity and mix of land use. The intention is also to create Inner City neighbourhoods as a preferred urban form to many residents. Active, diverse ground floors (shops, restaurants, offices, services) with no to minimal building setbacks. A vibrant and walkable area, with a focus on public transit and NMT rather than transport by car. Residential densification by means of building and precinct conversions & revitalisation. SPATIAL FORM: Highly accessible and permeable urban grid.	**DESIRED / ENOURAGED:** Highest Mix of Land Uses (up to 100% of floor area per building may be for non-residential, but internal mix per building promoted). Each street block to have combinations of 4+ types of different land uses (i.e. retail, residential, office, civic). **MINIMUM:** Street block to have a combinations of at least 2 different types of land uses. Example Uses Supported (may include other compatible uses): Commercial, residential, offices, retail, urban agriculture, public open space, recreation, community services, childcare, health care, and small scale non-polluting (including noise) urban manufacturing.	**DESIRED / ENOURAGED** 350+ du/ha **MINIMUM:** 100 du/ha See Table 10	**DESIRED / ENOURAGED:** Zero building lines supported. Building oriented toward the street. **MAXIMUM:** 1 - 2 Metre building line along ground floor with 0m vertical building line.	**PERMISSIBLE**: Coverage up to 100% Note: Applications to consider the availability and accessibility of functional recreational spaces and areas (on & offsite, outdoor & indoor)	***ACTIVATION*** **DESIRED / ENCOURAGED** 100 % Active Street Frontages. Non-residential uses on ground floor. **MINIMUM** 60-80% Street front activation. ***FRONTAGE*** **DESIRED / ENCOURAGED** No solid perimeter wall along street edges. Where physical enforcement is necessitated, visually permeable material for 100% of the street edge. Balconies, shop fronts, activity areas to be oriented towards the street for increased surveillance. **MINIMUM** Where physical enforcement is necessitated, no less than 80% of the frontage are to be visually permeable.	**DESIRED / ENOURAGED:** 5* Storeys and up (with surrounding built form considered). Ground Floor 4.5m – 6m in height from floor to ceiling to allow for maximum flexibility and use. **MINIMUM:** 3* Storeys and up (with surrounding built form, considered). Ground floor height at least 4.5m to allow for future repurposing and flexibility. Note: Building base, including sub-surface parking to not protrude 1.5m above lowest level of natural ground level. *Dependent on the locality and local context wherein the site is located (i.e. Inner City Core to have a higher minimum height given the surrounding context and character)	**DESIRED / ENCOURAGED** Fully submerged underground or at back of building (not forming a buffer between the street and the building) or screened by activated ground floor uses and located on upper levels of the building **MINIMUM:** Where parking is placed along a street frontage, it may not exceed 30% of the total street front. For open parking lots, permeable paving should be used and one tree per 3 parking spaces should be provided. Parking on upper floors should be visually screened through the use of architectural elements and should maintain the same vertical and horizontal articulation or rhythm and appearance of the façade of the building. See greening and open space guidelines.	**DESIRED / ENCOURAGED** 10% Functional open space located on site for residential buildings. Properties immediately surrounding public transit facilities to provide 10% functional open space for public benefit and use, i.e. in front of building or (controlled) access to internal open space. **MINIMUM** Internal recreational facilities for residential uses where open space cannot be provided and to the satisfaction of Council. Motivation for accessible off site open space within walking distance to be considered. the use of a permeable surface treatment.	**DESIRED / ENCOURAGED** Utility / Curb zone (infrastructure, trees, bins etc.) 1 – 1.2 m Pedestrian zone: 2 – 4m Spill Over Zone: Balance of sidewalk walk space after min width of pedestrian and utility zone. Where space is not available within the road reserve, it should be provided by means of building setbacks (1 – 2m) with 0 – 1m vertical building lines to allow for buildings to cantilever. **MINIMUM** Utility Zone: 1m Pedestrian Zone: 1.8 m – 2.5 m Spill Over Zone: 1m

1: Inner City Node									
Character of the Node/Zone	**Land use Mix Guidelines**	**Inner City Node Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
					Windows towards streets for enhanced surveillance. ***PEDESTRIAN ACCESS*** Direct pedestrian access to building from the street is required. Separate pedestrian entrance(s) from vehicular entrance. Where vehicular and pedestrian access require to be placed abutting one another, sidewalk treatment to be incorporated to ensure safety and pedestrian priority.		***VEHICULAR ACCESS*** **DESIRED / ENCOURAGED** No vehicular access and loading from streets that are regarded as public transit routes, activity streets or primary streets (where properties are located at intersections). Side streets to be utilised for vehicular access. **MINIMUM** Where side street access is not possible, vehicular access not to exceed 10 - 20% of the total frontage.		

2: Metropolitan Nodes

Table 2: Metropolitan Nodes Development Guidelines

2: Metropolitan Nodes									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
CHARACTER & DEVELOPMENT INTENT: Secondary Mixed use/commercial nodes of the City. High intensity and Mix of Land Use. Active, diverse ground floors (shops, restaurants, offices, services) with minimal setbacks. Of a similar quality, but lower intensity to the Inner City. SPATIAL FORM: Highly accessible and permeable urban grid (where feasible and relevant). Intersection spacing at 80 – 150m intervals. Intersection density 80 – 120 intersections per km².	**DESIRED / ENOURAGED:** Highest Mix of Land Uses (up to 100% of floor area per building may be for non-residential, but internal mix per building promoted). **MINIMUM:** Around nodal core and transit stations– a minimum combination of 2 different land uses per block. Example Uses Supported (may include other compatible uses): Commercial, residential, offices, retail, urban agriculture, public open space, recreation, community services, childcare, health care, and small scale non-polluting (including noise) urban manufacturing	**DESIRED / ENOURAGED:** Within nodal core and around transit stations a density of 150+ du/ha. **MINIMUM:** 80 du/ha See Table 10	**DESIRED / ENOURAGED:** Zero to 2 m building lines supported in nodal core area, high and active streets and around transit stations. Building oriented toward the street. **MAXIMUM:** 2 - 4 Metre building line along ground floor with 1 - 2m vertical building line. Around transit stations and along active streets 1m building lines.	Coverage should be high, up to 100%. Note: Applications to consider the availability and accessibility of functional recreational spaces and areas (on & offsite, outdoor & indoor)	***ACTIVATION*** **DESIRED / ENCOURAGED** 100 % Active Street Frontages in nodal core areas, around public transit and along high/ activity streets. Non-residential uses on ground floor. **MINIMUM** 80% Street front activation. ***FRONTAGE*** **DESIRED / ENCOURAGED** No solid perimeter wall along street edges, particularly in nodal core areas, surrounding public transit stations & high/ activity streets. Where physical enforcement is necessitated, visually permeable material should be used for 100% of the street edge. Balconies, shop fronts, activity areas to be oriented towards the street for increased surveillance. **MINIMUM** Where physical enforcement is necessitated, no less than 80% of the frontage are to be visually permeable. Windows towards streets for enhanced surveillance.	**DESIRED / ENOURAGED:** 3 to 20 (with surrounding built form, area character, physical and geographic considerations and motivation) Scaling down from higher (central) to lower (peripheral) intensity areas of the node is encouraged. As a guide, not more than 2 storeys higher than highest neighbouring erfs rights or use (whichever is higher). Note: Building base, including sub-surface parking to not protrude 1.5m above the lowest level of natural ground level, particularly around public transit areas and activity/high streets.	**DESIRED / ENCOURAGED** Fully submerged underground or at back of building (not forming a buffer between the street and the building). Or screened by activated ground floor and located on upper levels of the building **MINIMUM:** Where parking is placed along a street frontage, it may not exceed 30% of the total street front. For open parking lots, permeable paving should be used and one tree per 3 parking spaces should be provided. Parking on upper floors should be visually screened through the use of architectural elements and should maintain the same vertical and horizontal articulation	**DESIRED / ENCOURAGED** 10% Functional open space located on site for residential buildings within and surrounding the Transit Corridors. Properties immediately surrounding public transit facilities to provide the required 10% functional open space for public benefit and use, i.e. in front of building or (controlled) access to internal open space. **MINIMUM** Internal recreational facilities for residential uses where open space cannot be provided and to the satisfaction of Council. Motivation for accessible off site open space within walking distance to be considered.	**DESIRED / ENCOURAGED** Utility / Curb zone (infrastructure, trees, bins etc.) 1.2 - 1.5 m (max) Pedestrian zone: 3 – 4m Spill Over Zone: Balance of sidewalk walk space after min width of pedestrian and utility zone. Where space is not available within the road reserve, it should be provided by means of building setbacks (1 – 3m) with 0 – 1m vertical building lines to allow for buildings to cantilever, particularly within the nodal core areas, surrounding public transit, and along Activity / High Streets. **MINIMUM** Utility Zone: 1m Pedestrian Zone: 2.5m Spill Over Zone: 1m

2: Metropolitan Nodes									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
					PEDESTRIAN ACCESS Direct pedestrian access to building from the street, especially in the nodal core areas, surrounding public transit and along Activity / High streets. Separate pedestrian entrance(s) from vehicular entrance. Where vehicular and pedestrian access require to be placed abutting one another, sidewalk treatment to be incorporated to ensure safety and pedestrian priority.		or rhythm and appearance of the façade of the building. See greening and open space guidelines. ***VEHICULAR ACCESS*** **DESIRED / ENCOURAGED** No vehicular access from streets that are regarded as public transit routes, activity streets or primary streets (where properties are located at intersections). Side streets to be utilised for vehicular access. **MINIMUM** Where side street access is not possible, vehicular access not to exceed 10 - 20% of the total frontage.	Where parking is provided in open lots, 1 tree per three parking bays to be provided as well as the use of a permeable surface treatment.	

3: Regional Nodes

Table 3: Regional Nodes Development Guidelines

3: Regional Nodes									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Cover-age**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recrea-tional Facilities and Greening**	**Sidewalk Treatment**
CHARACTER & DE-VELOPMENT IN-TENT: Tertiary Mixed use/commercial nodes of the City. High intensity and Mix of Land Use. Active, diverse ground floors (shops, restaurants, offices, services) with minimal set-backs. Of a similar quality, but lower intensity to Metro-politan Nodes. SPATIAL FORM: Accessible and per-meable structure. Intersection spac-ing at 100 – 200m intervals. Intersec-tion density up to 80 intersections per km².	Highest Mix of Land Uses (up to 100%* of floor area per building may be for non-residential, but in-ternal mix per building pro-moted). Example Uses Sup-ported: Commer-cial, residential, of-fices, retail, public open space, recre-ation, community services, childcare, health care, and small scale non-polluting (including noise) urban manu-facturing *Subject to a con-textual assessment of the area.	**DESIRED / ENOURAGED:** Around transit stations a den-sity of 100+ du/ha. **MINIMUM:** 80 du/ha See Table 10	**DESIRED / ENOURAGED:** Zero to 3 m building lines supported along high and active streets and around transit stations. Build-ing oriented toward the street. **MAXIMUM:** 2 - 4 Me-tre building line along ground floor with 1 - 2m vertical building line. Around transit stations and along ac-tive streets 1m build-ing lines.	Cover-age should be high, up to 80%.	***ACTIVATION*** **DESIRED / ENCOURAGED** 100 % Active Street Frontages around public transit and along high/ activity streets. Non-residential uses on ground floor. **MINIMUM** 80% Street front activation along activity / high streets and surrounding public transit facilities. ***FRONTAGE*** **DESIRED / ENCOURAGED** No solid perimeter wall along street edges, particularly sur-rounding public transit sta-tions & high/ activity streets. Where physical enforcement is necessitated, visually per-meable material for 100% of the street edge. Balconies, shop fronts, activ-ity areas to be oriented to-wards the street for increased surveillance. **MINIMUM** Where physical enforcement is necessitated, no less than 60% of the frontage to be vis-ually permeable. Windows towards streets for enhanced surveillance. ***PEDESTRIAN ACCESS***	**DESIRED / ENOURAGED:** 3 to 10 with surround-ing built form, area character, physical and geographic considera-tions and motivation. Scaling down from higher (central) to lower (peripheral) in-tensity areas of the node is encouraged. **MINIMUM:** 3 – 5 Storeys along ac-tivity / high streets and surrounding public open spaces. As a guide, not more than 2 storeys higher than highest neigh-bouring erfs rights or use (whichever is higher). Note: Building base, including sub-surface parking to not pro-trude 1.5m above low-est level of natural ground level, particu-larly around public transit areas and activ-ity/high streets.	**DESIRED / ENCOUR-AGED** Fully submerged un-derground or at back of building (not forming a buffer be-tween the street and the building) or screened by acti-vated ground floor and located on upper levels of the building **MINIMUM:** Where parking is placed along a street frontage, it may not exceed 30% of the total street front. For open parking lots, permeable paving should be used and one tree per 3 park-ing spaces should be provided. See greening and open space guide-lines. Parking on upper floors should be visu-ally screened through the use of architectural ele-ments and should maintain the same vertical and horizon-tal articulation or	**DESIRED / EN-COURAGED** 10% Functional open space located on site for residen-tial buildings. Properties immedi-ately surround public transit facili-ties to provide the required 10% func-tional open space for public benefit and use, i.e. in front of building or (controlled) access to internal open space. **MINIMUM** Internal recrea-tional facilities for residential uses where open space cannot be provided and to the satisfac-tion of Council. Motivation for ac-cessible off site open space within walking distance to be considered. Where parking is provided in open lots, 1 tree per three parking bays to be provided as well as the use of a	**DESIRED / ENCOURAGED** Utility / Curb zone (infra-structure, trees, bins etc.) 1.2 - 1.5 m (max) Pedestrian zone: 3 – 4m Spill Over Zone: Balance of sidewalk walk space after min width of pedestrian and utility zone. Where space is not available within the road reserve, it should be provided by means of build-ing setbacks (1 – 3m) with 0 – 2m vertical building lines to allow for buildings to can-tilever, particularly sur-rounding public transit, and along Activity / High Streets. **MINIMUM** Utility Zone: 1m Pedestrian Zone: 3m Spill Over Zone: 1.5m

3: Regional Nodes									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Cover-age**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recrea-tional Facilities and Greening**	**Sidewalk Treatment**
					Direct pedestrian access to building from the street, especially surrounding public transit and along Activity / High streets. Separate pedestrian entrance(s) from vehicular entrance. Where vehicular and pedestrian access require to be placed abutting one another, sidewalk treatment to be incorporated to ensure safety and pedestrian priority.		rhythm and appearance of the façade of the building. ***VEHICULAR ACCESS*** **DESIRED / ENCOURAGED** No vehicular access from streets that are regarded as public transit routes, activity streets or primary streets (where properties are located at intersections). Side streets to be utilised for vehicular access. **MINIMUM** Where side street access is not possible, vehicular access not to exceed 10 - 20% of the total frontage.	permeable surface treatment.	

4: General Urban Zone

Table 4: General Urban Zone Development Guidelines

4: General Urban Zone									
		Development Guidelines (general Principles)							
Character of the Node/Zone	**Land use Mix Guidelines**	**Residential Density**	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
CHARACTER & DEVELOPMENT INTENT: An urban (not suburban) zone of the city with up to 5 storey residential or mixed use buildings. Medium intensity area, with a good scattering of land use mix (local shops and businesses mixed throughout the area, but concentrated on high streets and in neighbourhood nodes). A thoroughly walkable environment, with all local amenities available on foot. SPATIAL FORM: Accessible and permeable structure. Intersection spacing at 150m – 200m intervals. Intersection density up to 80 intersections per km².	A mix of uses allowed throughout the neighbourhood, but focussed on high streets (mixed use, active pedestrian streets), neighbourhood nodes and around public transport stations/stops. Up to 50% of floor area per building for non-residential (except in single storey existing building conversions which may be 100% non-residential). Example Uses Supported (may include other compatible uses): Light commercial, residential, offices, retail, public open space, recreation, community services, childcare, health care, and small scale non-polluting (including noise) urban manufacturing	**MINIMUM:** 60 du/ha As per Table 10	2 - 4 Metre building line, with the exception of activity / high streets where a 0 - 3m building line is required.	Coverage up to 60% for three floors, 50% for 4, and 40% for 5.	***ACTIVATION*** **DESIRED / ENCOURAGED** 100% Retail and service businesses (where present) activation on the ground floor of active / high streets and public transit facilities. Offices may be on other floors. **MINIMUM** 80% Street front activation along activity / high streets and surrounding public transit facilities. Where a property is located at an intersection, the frontage towards the primary street to be activated. ***FRONTAGE*** **DESIRED / ENCOURAGED** No solid perimeter wall along street edges, particularly surrounding public transit stations & high/ activity streets. Where physical enforcement is necessitated, visually permeable material for 100% of the street edge. Balconies, shop fronts, activity areas to be oriented towards the street for increased surveillance. **MINIMUM**	**DESIRED / ENOURAGED:** Up to 5 (with surrounding built form, area character, physical and geographic considerations and motivation. Scaling down from higher (central) to lower (peripheral) intensity areas of the node is encouraged. **MINIMUM:** 3 Storeys along activity / high streets and surrounding public open spaces. As a guide, not more than 1 storey higher than highest neighbouring erfs rights or use (whichever is higher).	**DESIRED / ENCOURAGED** Fully submerged underground or at back of building (not forming a buffer between the street and the building). Or screened by activated ground floor. **MINIMUM:** Where parking is placed along a street frontage, it may not exceed 30% of the total street front. For open parking lots, permeable paving should be used and one tree per 3 parking spaces should be provided. ***VEHICULAR ACCESS*** **DESIRED / ENCOURAGED** No vehicular access from activity streets or primary streets (where properties are located	**DESIRED / ENCOURAGED** 10% Functional open space located on site for residential buildings. **MINIMUM** 10% Functional open space located on site for residential buildings. Motivation for accessible off site open space within walking distance to be considered. Where parking is provided in open lots, 1 tree per three parking bays to be provided as well as the use of a permeable surface treatment.	**DESIRED / ENCOURAGED** Utility / Curb zone (infrastructure, trees, bins etc.) 1.2 - 1.5 m (max) Pedestrian zone: 2 – 4m Spill Over Zone: Balance of sidewalk walk space after min width of pedestrian and utility zone. Where space is not available within the road reserve, it should be provided by means of building setbacks (1 – 3m) with 1 – 2m vertical building lines to allow for buildings to cantilever, particularly along Activity / High Streets. **MINIMUM** Utility Zone: 1m Pedestrian Zone: 1.8 m Spill Over Zone: 1 - 3m

4: General Urban Zone									
		Development Guidelines (general Principles)							
Character of the Node/Zone	**Land use Mix Guidelines**	**Residential Density**	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
					Where physical enforcement is necessitated, no less than 60% of the frontage to be visually permeable. Windows towards streets for enhanced surveillance. ***PEDESTRIAN ACCESS*** Direct pedestrian access to building from the street, especially surrounding public transit and along Activity / High streets. Separate pedestrian entrance(s) from vehicular entrance. Where vehicular and pedestrian access require to be placed abutting one another, sidewalk treatment to be incorporated to ensure safety and pedestrian priority.		at intersections). Side streets to be utilised for vehicular access. **MINIMUM** Where side street access is not possible, vehicular access not to exceed 10 - 20% of the total frontage along activity / high streets.		

4a: Local Economic Development (LED) Zone

Table 5: Local Economic Development (LED) Zone Development Guidelines

4a: Local Economic Development Zones									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
CHARACTER & DEVELOPMENT INTENT: An environment similar to "General Urban Zone" but with a focus on promoting economic land uses (diversifying high density, single use, residential areas). SPATIAL FORM: Accessible and permeable structure. Intersection spacing at 150m – 200m intervals. Intersection density up to 80 intersections per km².	A mix of uses allowed throughout the neighbourhood, but focussed on high streets (mixed use, active pedestrian streets), neighbourhood nodes and around public transport stations/stops. Up to 80% of floor area per building for non-residential (except in existing buildings which may be 100% non-residential). Example Uses Supported (may include other compatible uses): Light commercial, residential, offices, retail, public open space, recreation, community services, childcare, health care, and small scale non-polluting (including noise) urban manufacturing	**MINIMUM:** 60 du/ha As per Table 10	2 - 4 Metre building line, with the exception of activity / high streets where a 0 - 3m building line is required.	Coverage up to 60% for three floors, 50% for 4, and 40% for 5.	***ACTIVATION*** **DESIRED / ENCOURAGED** 100% Retail and service businesses (where present) activation on the ground floor of active / high streets and public transit facilities. Offices may be on other floors. **MINIMUM** 80% Street front activation along activity / high streets and surrounding public transit facilities. Where a property is located at an intersection, the frontage towards the primary street to be activated. ***FRONTAGE*** **DESIRED / ENCOURAGED** No solid perimeter wall along street edges, particularly surrounding public transit stations & high/ activity streets. Where physical enforcement is necessitated, visually permeable material for 100% of the street edge. Balconies, shop fronts, activity areas to be oriented towards the street for increased surveillance. **MINIMUM**	**DESIRED / ENOURAGED:** Up to 5 (with surrounding built form, area character, physical and geographic considerations and motivation. Scaling down from higher (central) to lower (peripheral) intensity areas of the node is encouraged. **MINIMUM:** 3 Storeys along activity / high streets and surrounding public open spaces. As a guide, not more than 1 storey higher than highest neighbouring erfs rights or use (whichever is higher).	**DESIRED / ENCOURAGED** Fully submerged underground or at back of building (not forming a buffer between the street and the building). Or screened by activated ground floor. On street parking may be permissible where feasible. On street parking to not obstruct, obscure or reduce pedestrian movement, i.e. sidewalk space. **MINIMUM:** Where parking is placed along a street frontage, it may not exceed 30% of the total street front. For open parking lots, permeable paving should be used and one tree per 3 parking spaces should be provided. ***VEHICULAR ACCESS*** **DESIRED / ENCOURAGED** No vehicular access from activity streets or primary streets (where properties are located at intersections). Side streets to be utilised for vehicular access. **MINIMUM**	**DESIRED / ENCOURAGED** 10% Functional open space located on site for all residential buildings. **MINIMUM** 10% Functional open space located on site for all residential buildings. Motivation for accessible off site open space within walking distance to be considered. Where parking is provided in open lots, 1 tree per three parking bays to be provided as well as the use of a permeable surface treatment.	**DESIRED / ENCOURAGED** Utility / Curb zone (infrastructure, trees, bins etc.) 0.8m – 1 m (max) Pedestrian zone: 2 – 3m Spill Over Zone: Balance of sidewalk walk space after min width of pedestrian and utility zone. Where space is not available within the road reserve, it should be provided by means of building setbacks (1 – 2m) with 1 – 2m vertical building lines to allow for buildings to cantilever, particularly along Activity / High Streets. **MINIMUM** Utility Zone: 1m Pedestrian Zone: 1.8 m Spill Over Zone: 1 - 2m

4a: Local Economic Development Zones									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
					Where physical enforcement is necessitated, no less than 60% of the frontage are to be visually permeable. Windows towards streets for enhanced surveillance. ***PEDESTRIAN ACCESS*** Direct pedestrian access to building from the street, especially surrounding public transit and along Activity / High streets. Separate pedestrian entrance(s) from vehicular entrance. Where vehicular and pedestrian access require to be placed abutting one another, sidewalk treatment to be incorporated to ensure safety and pedestrian priority.		Where side street access is not possible, vehicular access not to exceed 10 - 20% of the total frontage along activity / high streets.		

5: Suburban Zone

Table 6: Suburban Zone Development Guidelines

5: Suburban Zone									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
CHARACTER & DEVELOPMENT INTENT: Medium to low density residential areas (predominantly Residential 1) with mixing of land uses to accommodate local needs as per scheme (home based shops, home enterprises, local services - hair salons, estate agencies, etc.) SPATIAL FORM: Accessible and permeable structure. Intersection spacing at 150m – 250m intervals. Intersection density up to 80 intersections per km².	Mainly residential, but with local non-residential functions supported as per scheme. Where high streets are present, higher mix and intensity of land uses supported (as with the General Urban Zone). Home offices*, small scale neighbourhood retail, home enterprises*, public open space, salons*, estate agencies, community services & recreation, childcare. *Not exceeding the maximum floor area as per the Town Planning Scheme.	As per index section 4.2 Additional density can be considered based on contextual assessments, site specific merits and inclusionary housing.	**DESIRED / ENOURAGED:** Homes to be placed as close to the street as possible to enhance local street surveillance and interaction. Maximum of 5 m building line. **MAXIMUM:** For new buildings a maximum building line of 5 – 7m.	Coverage as per scheme. Additional coverage can be considered based on contextual assessments and site specific merits.	***ACTIVATION*** Small scale local businesses along active and neighbourhood high streets. Home enterprises and offices to be located on prominent street corners & intersections and in close proximity to public open space, community service, bus stops etc. ***FRONTAGE*** Limited solid perimeter wall along street edges, particularly surrounding bus stops & high/ activity streets. Where physical enforcement is necessitated, visually permeable material for at least 40% of the street edge. Homes, offices and home enterprises to be oriented towards the street for increased surveillance. Where physical enforcement is necessitated, consideration of partial visually permeable material. ***PEDESTRIAN ACCESS*** Where blocks of flats or row houses are considered, separate pedestrian access directly from the street are advised.	Up to 3 or as per scheme Additional heights can be considered based on contextual assessments and site specific merits.	Variable, away from street boundary and behind buildings where possible. Where parking behind the building is not feasible, screening from the street – particularly with regards to flat blocks, row houses or any other form of grouped housing is concerned. This shall also apply to local activity streets. ***VEHICULAR ACCESS*** Along neighbourhood high / activity streets vehicular access to be provided from secondary / side streets where possible.	Minimum of 10% Functional open space located on site for all residential uses. Where parking is provided in open lots, 1 tree per three parking bays to be provided as well as the use of a permeable surface treatment.	Utility Zone: 1m Pedestrian Zone: 1.8 m Spill Over Zone: 1 - 2m along local activity streets or where home enterprises are directly accessed from the street.

6: Agricultural / Peri-urban Zone

Table 7: Agricultural / Peri-urban Zone Development Guidelines

6: Agricultural/Peri-Urban Zone									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
CHARACTER & DEVELOPMENT INTENT: Low density and intensity residential/agricultural areas. Mixing of land use as per scheme. Maintain low intensity residential/agricultural environment.	Agricultural or low intensity residential uses. Non-residential uses as per scheme.	As per index section 4.2	Variable.	Coverage as per scheme.	Variable. Context and site specific.	As per scheme	Variable, away from street boundary where possible.	Retain and protect natural vegetation, trees and water courses. Significant functional open space, but no minimum requirement – context and site specific. Where parking is provided in open lots, 1 tree per three parking bays to be provided as well as the use of a permeable surface treatment.	Variable. Context and site specific.

7: Beyond the Urban Development Boundary and Critical Biodiversity Areas

Table 8: Beyond the Urban Development Boundary Development Guidelines

7: Beyond the Urban Development Boundary									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
As per the SDF 2040	As per the SDF 2040	n/a No residential densification		Maximum of 8% coverage of developable area (i.e. area excluding undevelopable area due to environmental sensitivities, etc.)	Variable. Context and site specific.	n/a	Any parking areas must be permeable (natural ground, grass, or permeable paving)	Where parking is provided in open lots, 1 tree per three parking bays to be provided.	

Table 9: Critical Biodiversity Areas

Critical Biodiversity Areas									
Character of the Node/Zone	**Land use Mix Guidelines**	**Development Guidelines (general Principles)**							
		Residential Density	**Building Placement and Orientation**	**Coverage**	**Edge Treatment, Street Frontage, Pedestrian Access**	**Height**	**Parking Location and Vehicle Access**	**Functional Open Space; Recreational Facilities and Greening**	**Sidewalk Treatment**
As per environmental legislation, GDARD, EISD Policy the SDF 2040.	n/a	n/a	n/a		n/a	n/a	n/a		

Other Required Considerations for All Development Zones

FAÇADE TREATMENT

Architectural articulation and variety by means of the following:

- Colour use;
- Balconies, arcades and overhangs;
- Building portions recessed;
- Building breaks;
- Artwork & animation (not including advertisement);
- Controlled and minimal outdoor advertising, subject to approval in terms of the relevant by-laws.

Corner building to receive architectural articulation with main entrance onto the primary street with interactive facades along the secondary street

3.1.4. Urban Design Considerations for all Nodes and Zones

Purpose of Form Based Codes

The intent of the Design Guidelines and Form-based Codes is to ensure the implementation of the spatial vision for the City as contained in the Spatial Development Framework 2040. It seeks to interpret and spatially express generally accepted principles related to efficient and desired urban form. It is furthermore supplementary to the Land Use Scheme (LUS) and should hence guide and inform approval conditions.

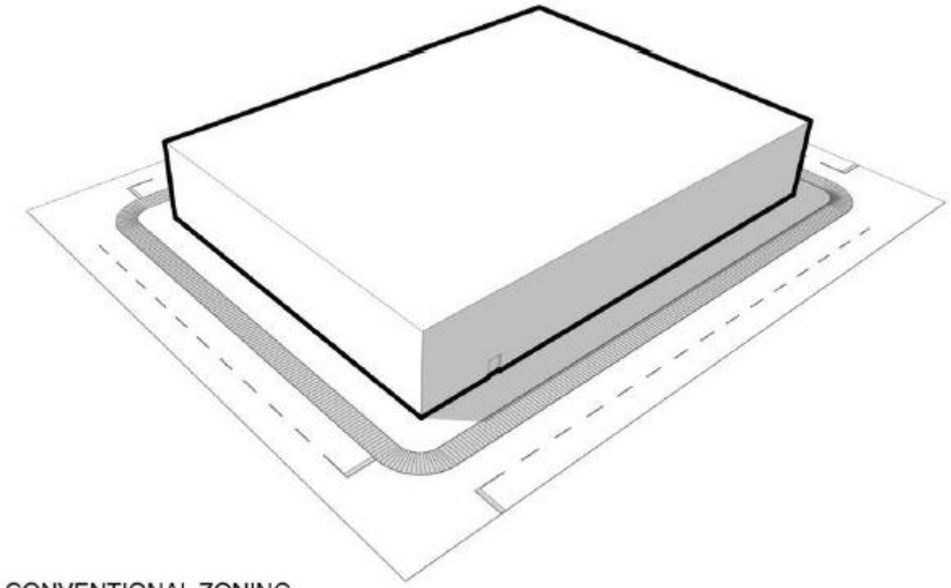
The aim of the Nodal Review is to re-establish the focal areas of the City and hence unlock potential for economic growth and inclusion. Therefore, the guidelines and design codes contained herein seeks to build on the logic of densification and intensification and utilise design elements to ensure that a well-considered and balanced approach is adopted to ensure maximum urban efficiency, liveability and sustainability. In addition to this the primary underlying philosophy of these codes are 'creating places for people' and hence these guidelines and codes are aimed at achieving this as well.

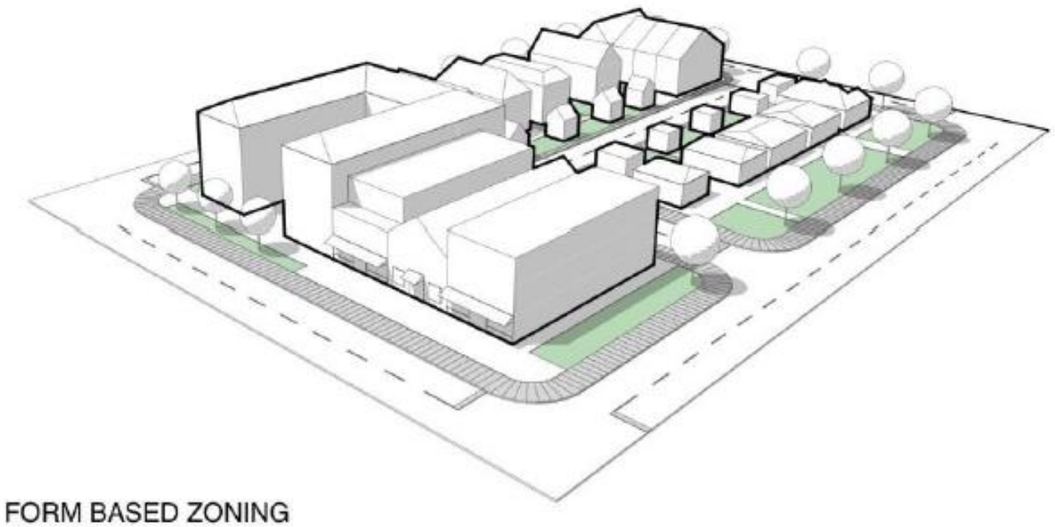
The Design Guidelines and Form-based Codes specifically address the following:

- Creating distinctive, attractive environments with a strong sense of place and local ownership;
- Land use intensification and densification that provides additional opportunities for intensity development, but that are designed to activate the street and increase the number and diversity of users;
- Creation of a range of housing opportunities and choices to address a wide spectrum of housing needs and achieve socio-economic integration;
- Land use and transportation integration, by strengthening and directing development around transit amenities and in so doing increase public transport ridership;
- Creating pedestrian friendly environments by providing a high quality streetscape that create a comfortable environment for pedestrians.
- Promoting alternative modes of transportation to the private vehicle, e.g. walking and cycling.

All the guidelines contained in this document shall be interpreted within a specific property development context and therefore be reflected in Site Development Plans which will be used in the assessment of land use management applications.

The City shall retain the final / sole discretion in the interpretation and application of the guidelines contained in this document to site specific contexts, without compromising the intent of the Spatial Development Framework 2040.





(Source: Louis Botha Special Development Zones Form Based Codes, 2017)

a) Precinct, Neighbourhood and Street Character & Identity

Description

From various stakeholder and community engagements it has become apparent that a particular concern is the implications that the realisation and implementation of this Nodal Review may have on the current precinct, neighbourhood and street character of specific areas. This change in character and the degree thereof is however subject to the specific area, its allocated nodal hierarchy, the current perceived character, and, ultimately the rate of uptake of rights. Character in this regard is defined and understood as the particular 'identity' of an area that can be expressed in a number of ways including the physical built form, geographical and natural elements, street scape and local businesses. These elements together forms a cognitive map and image of that particular area that residents relate and ascribe to. The City is clear on its mandate to transform the current city into one that is compact, dense, mixed and most importantly inclusive and hence shall not comprise on these objectives purely for the sake of preserving a particular character. However, the City also acknowledges that the key to successful cities, public spaces and places are engaged citizens who can relate to their environment and have an increased sense of 'ownership', albeit psychological and emotional forms of ownership rather than in legal terms such as property ownership. To this extent it is also critical for development of any scale to find alternative ways of 'preserving', expressing and promoting the local area character and in so doing also co-produce a new iteration of that identity for the area that seeks to balance the needs of the existing- and future local community with the overall strategic spatial transformation mandate. To this extent developers, applicants and any other built environment role players are encouraged to consider and incorporate the following strategies that may reduce community concerns regarding their changing environments and in so doing also establish a shared future vision for the area in relation to the nodal hierarchy and permissible development rights.

Procedural Consideration:

- ***Collective Visioning & Bargaining***

Although this Nodal Review entailed and incorporated substantial public engagement, it is never the less is recommended that additional public participation and discussion be conducted where larger developments are concerned. The intention of such engagements is not necessarily to negotiate the rights that are already permitted in terms of this review, but to rather negotiate site layout, design and amenities that could positively contribute to the existing (and future) community. Aside from purely a character and identity perspective, this have also been found to reduce polarisation of communities and ultimately a significantly streamlined development application and construction process. During such bargaining engagements, design (architecture, screening, façade treatment, greening etc.) and development controls (height & scale, building lines etc.) ought to be utilised as the negotiating tools to arrive at a more balanced and phased / gradual development approach – especially where significant additions of bulk is concerned. In this respect no clear definition for 'larger developments' exist and hence developers and applicant are encouraged to consult the City.

For longer term, phased and multiple property / block developments it is recommended that Precinct Plans be completed, albeit purely for the use of the community and not for the approval as Council Policy per se. Such Precinct Plans are to systematically unpack and programme spatial and structural configurations, confirm the availability of bulk services and traffic implications (more than often significant community concern and development blockage), desired future area character, required public amenities etc. The Precinct Planning process in itself necessitates public engagement and hence serves as an opportunity for the local affected community to not only voice concerns, but also negotiate certain outcomes that would provide surety and certainty as to how the environment may be changing and what role they can play in it. Simply put, a Precinct Plan should be considered a 'social contract' with the community and a roadmap for the various required actions to realise the ultimate developmental vision. Reference should be made to the CoJ Spatial Framework Formulation Guidelines.

Design Considerations:

- ***Streetscape Design***

Communities often ascribe area character and identity to the current streetscape, i.e. how trees, lights, sidewalks and other elements are aligned to the street and interact with the built form. To this extent, where possible & feasible, as much of the existing streetscape should be retained, or, repurposed when larger scale development is considered. This may include the relocation of streetscape elements to allow for greater mobility and access, but it should be kept as close to the original character-forming arrangement as possible. Where not possible, an agreed upon streetscape configuration can be negotiated. Streetscape design and character could however not be used as a proxy to deny intensification and densification in higher order nodes.

- ***Heritage & Architecture***

Architecture is of particular relevance in areas where heritage buildings and sites (including streetscapes and views) are concerned. Numerous areas included in the higher to highest order nodal hierarchy are significantly affected by heritage, but should again not be utilised as a proxy to restrict, restrain and oppose transformation. Instead thoughtful architecture should retain elements thereof as well as find appropriate alternative means of expression. This would typically involve retention of the building frontage with additional adaptions, or the entire repurposing of structures by providing it with a new utility, but within the transformed context. Other architectural considerations are to identify the common design style and to utilise trace design elements to create structures that seem more in line with the surrounding built form context. This may entail structural elements such are building frontages, as well as more aesthetic elements such as materiality, colour and orientation.

- ***Views and Vistas***

A vital characteristic of many areas are the preserved views and vistas that not only play an aesthetic role, but more than often functional in addition. Views and vistas are discussed in detail below.

- ***Scaling***

Appropriate scaling of developments, as discussed in detail below, could considerably contribute to the redevelopment of areas. In this regard scaling may be utilised to reduce the perceived visual impact of larger developments in relation to immediately surrounding areas. Scaling may also be utilised in area with heritage significance.

- ***Public Amenity & Safety***

Intensification and densification are often misconstrued for creating unsafe areas due to the increase in elements and a reduction in control thereof. Therefore, spatial hierarchy is an essential consideration for the creation and safety of public space. This is discussed in greater detail below.

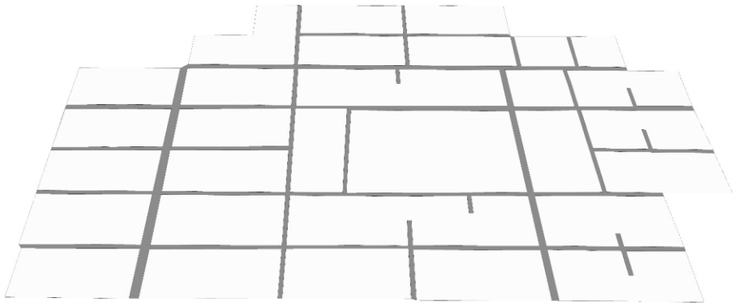
b) Accessibility & Permeability

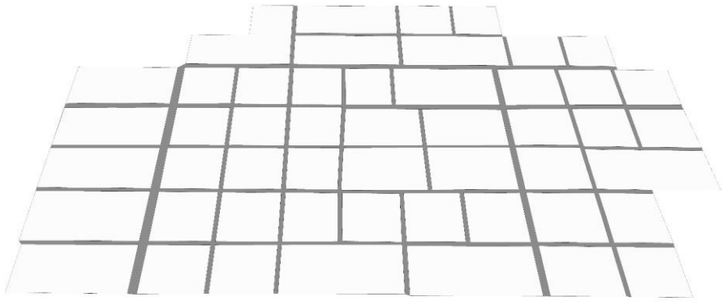
Description

Permeability can be defined as "…the number of alternative ways through an environment…" (Bentley et al, 1985: 10) thereby creating enhanced choice of movement and access. Simply put, it refers to shorter distances between street intersections that allows greater mobility through an area. More permeable areas typically experience less traffic congestion as physical barriers to movement and channelling of traffic is reduced. Furthermore, it creates significant opportunity for more diverse land uses due to increased access and mobility.

Permeability across all spatial scales is regarded as an important factor to create safer spaces as it also contributes towards the better definition of public and private space. Therefore, permeability and access are principles that could be applied across virtually all planning spatial scales right down to a particular property layout and building design.

The SDF 2040 expresses permeability in terms of the number of intersections per km². The indicative range for permeability across the entire City is 80 – 120 intersections per km². The exact number of intersections per km² would however be context and nodal hierarchy dependent and should therefore be considered in light of various essential factors, including but not limited to: nodal hierarchy and characteristics as per this policy; proximity to the internal nodal core; geography and physical / natural features; current and future character of the area; current and future predominant land uses; population density; public transit; public space; etc.





Nodal Implications

As alluded to in the description above, permeability applies to all spatial scales. Therefore, in terms of the overall nodal implications the following can be applied to a nodal area as a whole to enhance permeability:

- Breaking up of large street blocks by means of mid-block through movement;
- Spacing of intersections between 60 – 250 m (depending on the nodal hierarchy, character and future use of the area);
- Where additional streets are unfeasible, mid-block breaks could be achieved by means of pedestrian networks that requires less space yet achieves greater overall movement and access;
- Removal or reduction of the number of cul-de-sac s in an area by way of creating links to surrounding streets.

Site Implications

Site specific conditions also significantly contribute to the overall permeability of an area and hence the following actions are relevant at a site specific scale.

- Removal of visually and physically obstructive structures (buildings that are too large) or urban features (landscaping and urban infrastructure that creates blockages);
- Consideration of public / private interface towards streets and other public amenities;
- Dividing the properties along the street boundary into smaller sections to allow for multiple entrances into the site and / or buildings;
- Scale considerations - see below. (Bentley et al, 1985: 13-14)

c) Land Use Intensification (Mixing)

Description

Land use intensification + integration, also more commonly referred to as ‘mixed use’, and refers to the allocation of compatible land uses within close proximity. This is a move away from modernist planning that sought to create areas with distinct, single uses - hence the emergence of the zoning system. However, this type of homogenous planning further encourages urban sprawl and inefficiency and results in less frequented areas thereby reducing surveillance, giving rise to safety concerns. Not all areas are suitable for this type of development as certain areas’ context just quite simply does not lend itself to becoming intensified nodes. Furthermore, the concept of mixed use is often interpreted as only occurring on a single site / single building, i.e. vertical mixing. However, horizontal mixing across two or more adjacent properties should also be considered, especially given the ‘scaling down’ effects it could have where such areas are located towards the boundaries of two different nodal hierarchy areas. As previously mentioned, land use compatibility is a factor that is taken into consideration when development proposals are evaluated. This will ensure that, for example, industrial uses aren’t mixed with residential uses as the former use would severely impact on the overall liveability of residents.

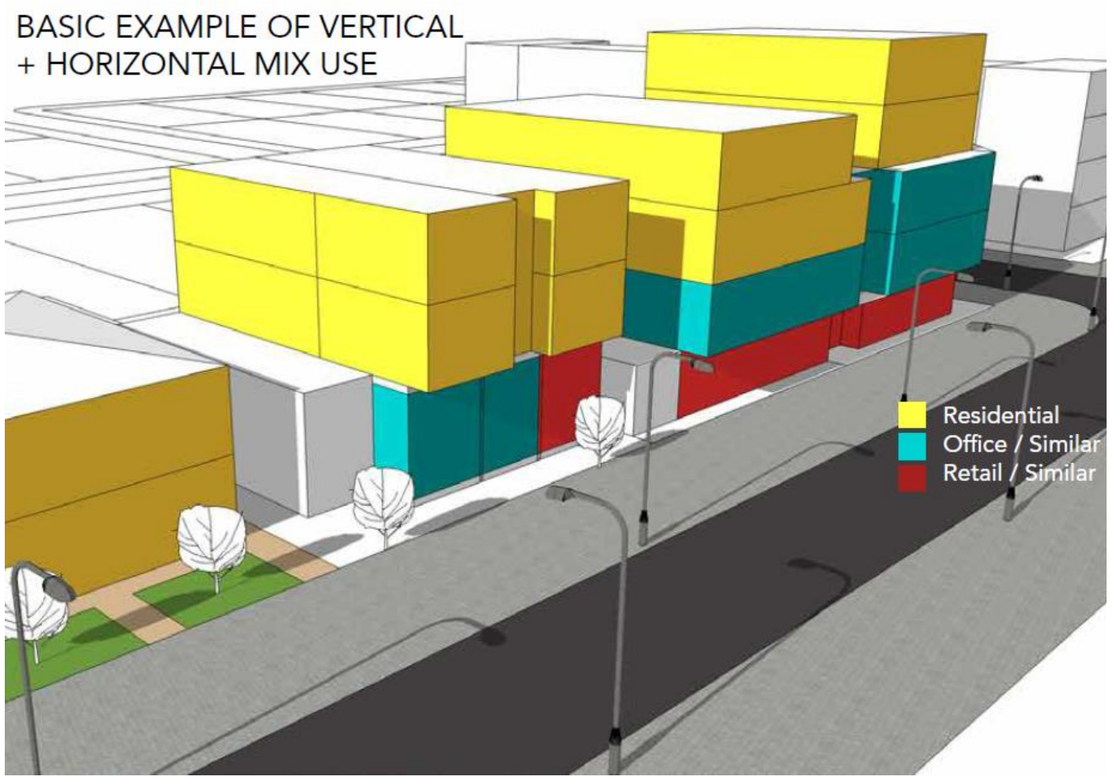
Nodal Implications

The very purpose of the nodal review is in essence to determine which areas are eligible for intensification and densification to ensure inclusive economic growth. Therefore, the detailed tables to follow indicates the desired degree of land use intensification per nodal hierarchy. From a more general perspective and as per the introduction, the overall intensification strategy should be focused around transit stations and mobility networks, ideally within a reasonable walking distance. In lower intensity nodes mixing of land uses is also encouraged, but weighted more towards residential uses and neighbourhood services & retail.

Site Implications

From a site and precinct specific context, vertical mixing of land uses are encouraged and could contribute significantly towards the quality of- and interaction with public spaces such as streets, plazas, squares and parks. For this reason land uses should not be restricted to particular functions, but instead allow for maximum flexibility and interchangeability. Critical considerations for land use mixing include:

- Proximity to transit amenities;
- Proximity to public amenities;
- Supplementary and complimentary uses;
- Community support services;
- Recreational amenities;
- For building conversions - typology, access, orientation and floor area.



d) Height and Scale

Description

A policy that promotes densification (such as this one) inherently calls for increased heights in priority development areas. A balance must be sought however, when making or assessing applications between sensitively considering surrounding built form while promoting the development intent of the SDF 2040 and Nodal Review. Whereas as height is typically expressed as 'number of storeys', scale refers to the relationship between the height of a particular building or precinct and the surrounding environment. Scale could therefore also be described as the balanced proportions between built form elements, the natural environment, public space and geography. In addition, floor-to-ceiling (single storey building) and floor-to-floor (2 or more storey building) height expressed in metres is also an important consideration that is primarily dictated by the use and utility of the property and associated buildings. Retail and office buildings typically have higher floor-to-ceiling heights in comparison to residential uses. However commercial buildings have even higher floor heights than retail and hence should be taken into consideration. Additional broad considerations include:

- Street servitude width (including sidewalk);
- Public spaces such as squares and plazas;
- Natural light and micro climate conditions;
- Street function;
- Precinct land uses; etc.

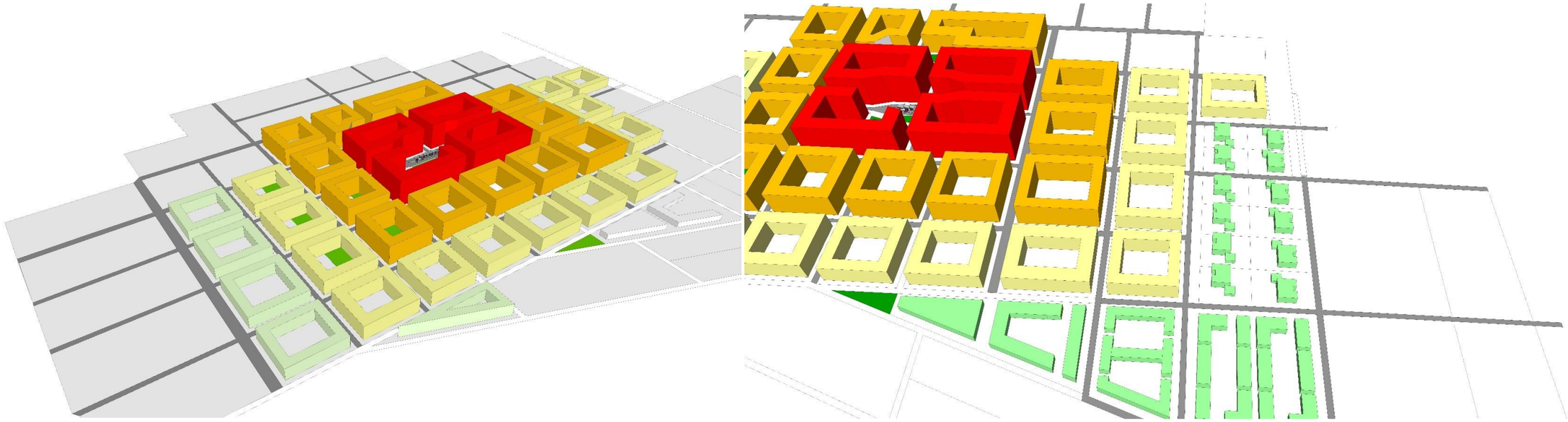
Nodal Implications

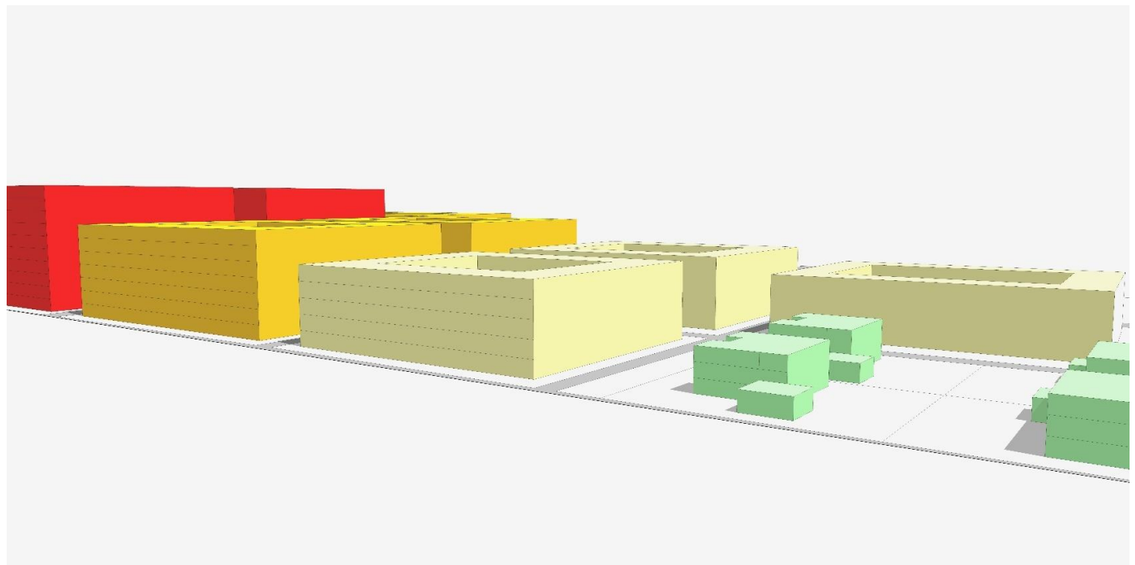
From a nodal perspective, heights should gradually increase from the peripheral areas towards the cores of the various nodes. Maximum heights within these various zones would be dependent upon the nodal hierarchy, envisioned urban form, density and other area specific considerations. Height restrictions should be relaxed around public transit and other public amenities stations as to allow for greater densities and mixing of land uses. Increased heights are also encouraged along activity streets and other areas of employment opportunity. Towards the boundaries of the node a gradual height reduction approach should be adopted. The transition between the different nodal hierarchies can include the following measures to attain a more gradual and less imposing height increase:

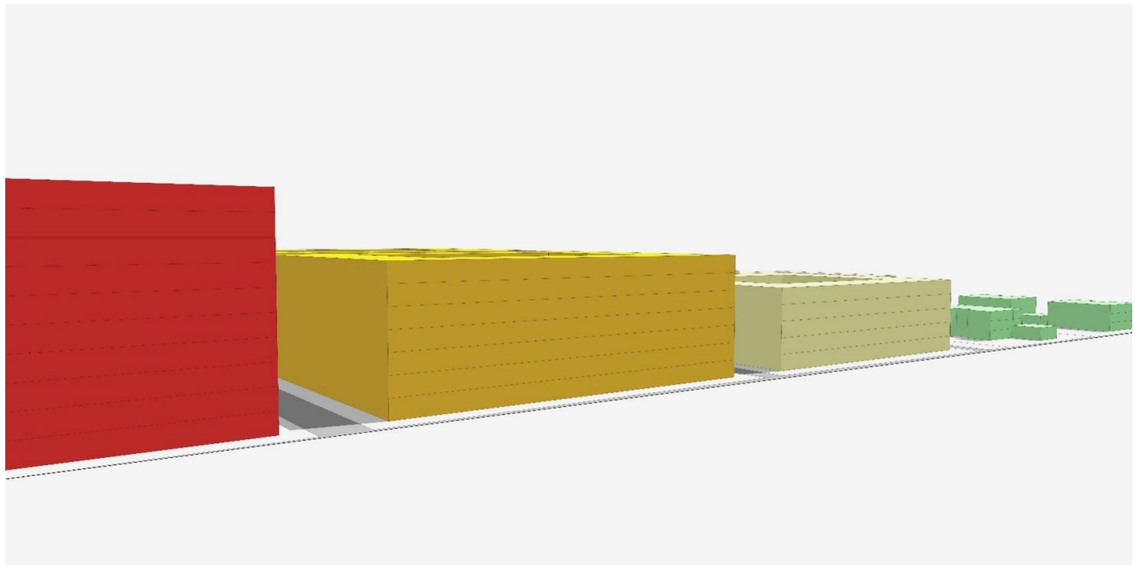
- Green buffers;
- Building set-backs (vertical & horizontal);
- Building breaks;

These elements would reduce challenges pertaining to shadow casting and overlooking as illustrated in the images in the following sections.

Another critical consideration for the node itself is along the nodal boundaries between different hierarchies. A higher order node would permit higher densities and building height compared to a lower order node. To ensure an efficient and gradual increase, properties located immediately abutting the nodal boundary within the higher order node ***not to exceed 2 storeys of the maximum height permissible in the neighbouring lower order node***. This may however also in certain circumstances be deemed irrelevant or unnecessary where road / streets are significant; where alternative buffers (as above) are in place or where abutting streets are activity spines.

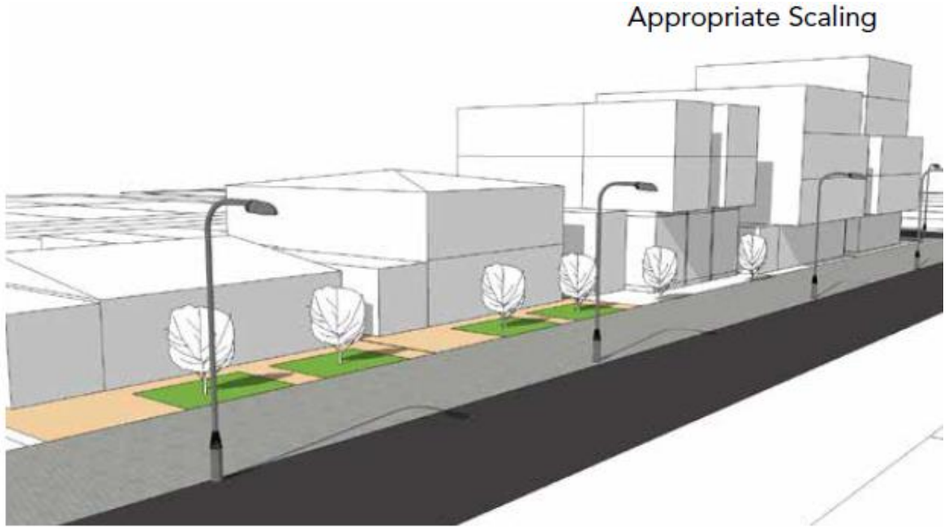


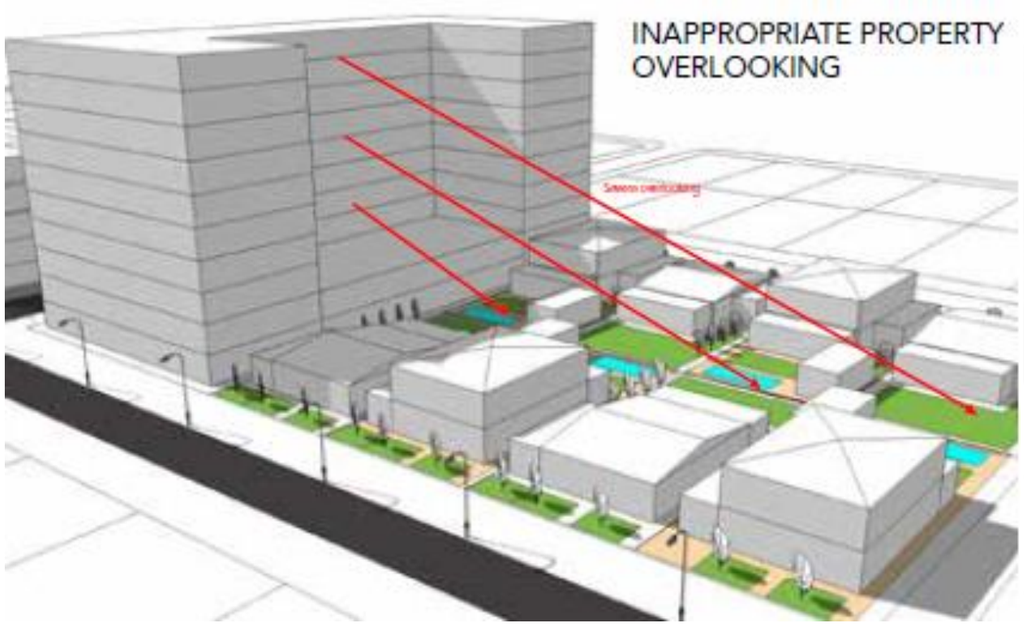




Site Implications

Considerations for height and scale are of particular importance at a precinct and site specific scale, as it has an immediate impact on the quality of the urban environment in terms of safety and security, privacy and micro climate (natural light). The following images illustrates potential height and scale challenges and proposes basic mitigation strategies.



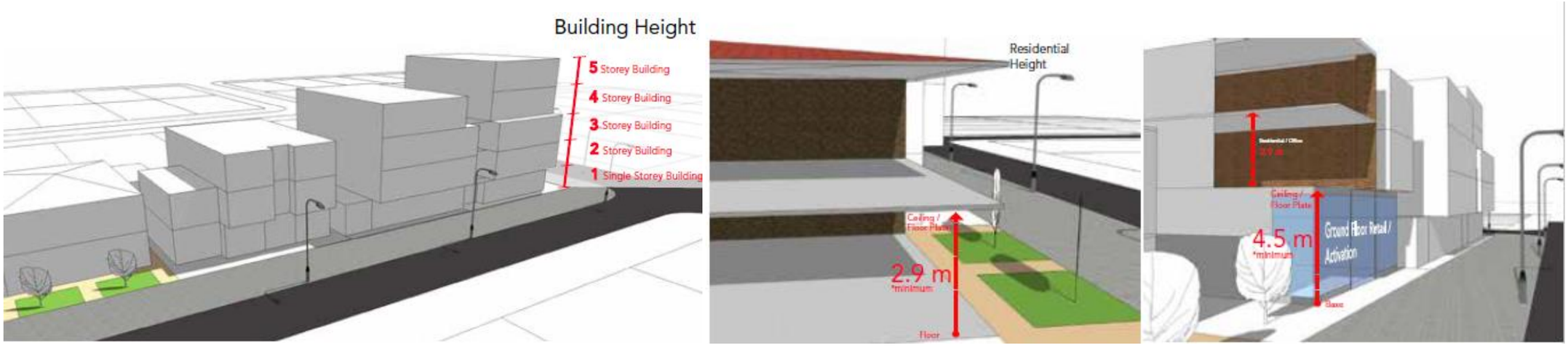


The images above are depictions of possible scenarios where there the permissible maximum height rights in a higher order node may impose negative effects onto a neighbouring, or yet developed, neighbouring area. Excessive overlooking and constant shadow casting occurs due to significant differences in height as well as the solid, continuous nature of the larger building. The images on the right (top and below) illustrates however how this could be resolved by means of:

- Vertical set-backs;

- Building line increases;
- Natural screening;
- Building block breaks to allow sun penetration;
- Orientation.

These considerations ought to be applied to upon detailed site design and Spatial Development Plan approval.



As previously alluded to, another factor impacting on physical height and scale is the floor-to-ceiling/ floor heights. This should also entail a balanced approach taking into consideration:

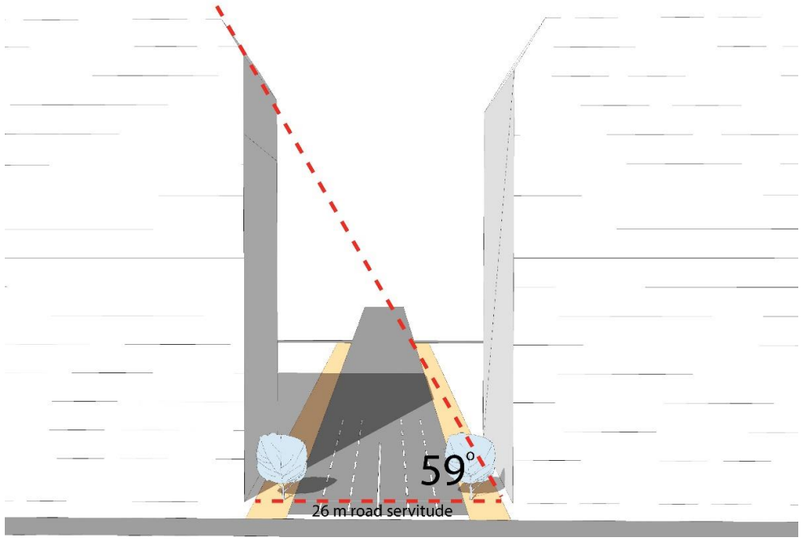
- Intented use and function of each building / storey vs. minimum required and appropriate heights;
- Locality in terms of the node itself, i.e. buidlings towards the core of the node should ideally have higher floor-to-ceiling / floor heights to ensure maximum flexibility and street / public space opportunities;
- Level of street interaction required / associated with the particular use.

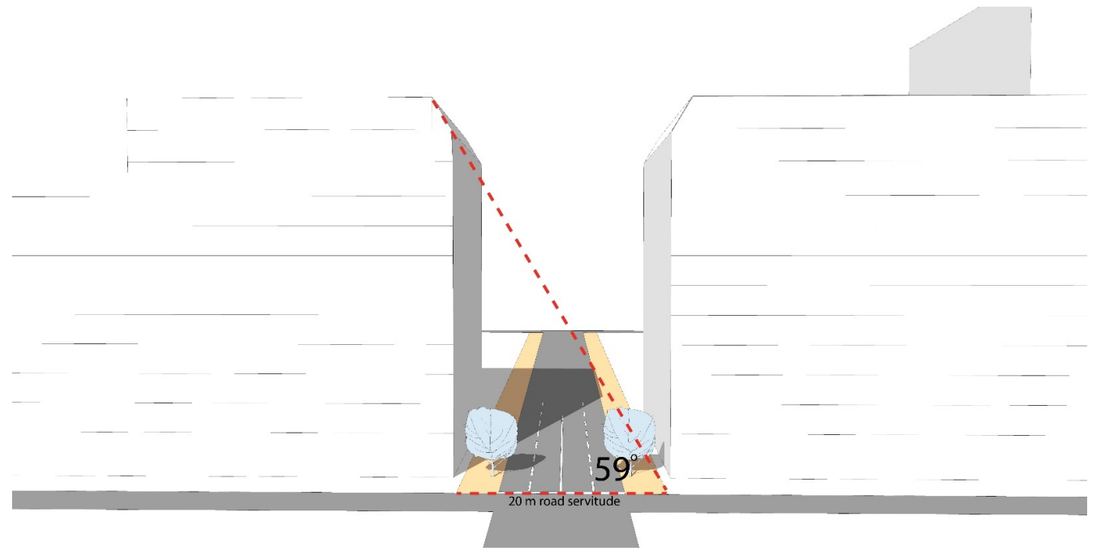
Typical floor to ceiling heights are:

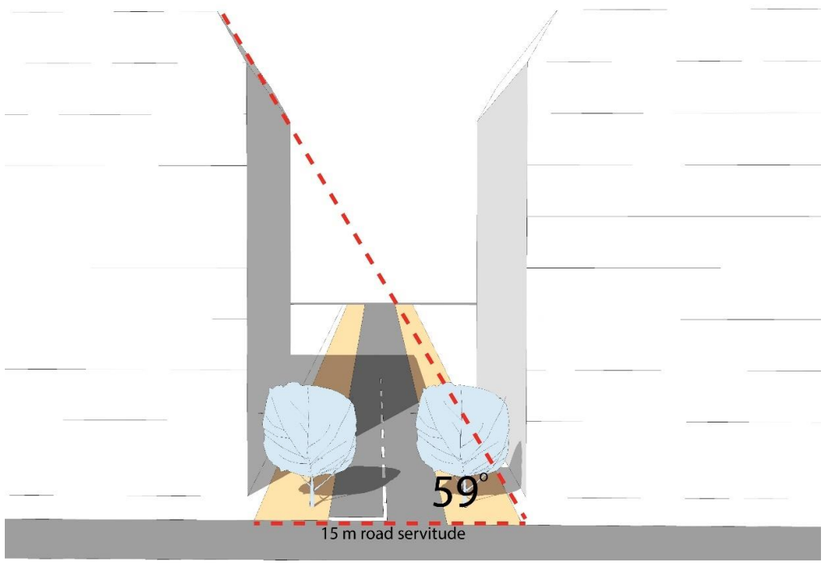
- Residential: 3 – 4m
- Retail & Office: 4.5 – 6m
- Larger Retail & Commercial (including showrooms, non-polluting (including noise) urban manufacturing, galleries & public buildings): 6m +

These heights are however not restrictive and should therefore be allocated according to site & precinct specific context.

Another important consideration is the fact the primary zoning for the majority of Inner City properties (which falls within the highest order Node) height is restricted to the 59˚ rule. In terms of this restriction the maximum height of a building is not restricted to the maximum attainable number of storeys per se, but rather the height in metres that is formed by a 59˚ angle from the end of the street servitude across from the property in question. Therefore height is a factor of road width as opposed to a predetermined height as per other Town Planning Schemes. The images below illustrates this principle based on three road categories.







As can be seen from these images, building heights (in terms of storeys) are roughly calculated as follow, using a 4m sidewalk and 1m building setback as the standard for all illustrations:

- For a 6 lane road with a total servitude of 26m the building height equates roughly to 16 storeys with slight diagonal cut at the top;
- For a 4 lane road with a total servide of 20m the building height equates roughly to 12 storeys;
- For a 2 lane road with a total servitude of 15m the buidling height equates to 9 storeys.

These restrictions are however removable/ relaxable by means of a land use application. Height reduction should be considered in light of the following to ensure it's initial purpose, i.e. to avoid dark, cold Inner City areas with significant shadow casting and the creation of wind tunnels:

- Vertical set backs beyond the allowable height line;
- Building breaks, both vertically as well as on ground floor level, to allow for sunlight to permeate and provide natural lighting to sidewalks;
- Use of reflective building material;
- Building recesses.

Although the Inner City in essence has an unlimited height restriction, these design elements are critical to creating liveable areas.

c.) Defensible Space & Spatial Hierarchy

Description

When considering crime and safety in design, the concept of Spatial Hierarchy and Defensible Spaces is often listed as an essential consideration. In this regard 'space hierarchy' can be described as those elements on a property that indicates and gives a clear impression of which spaces are public spaces (i.e. for the use of the general public) and those that are more exclusively reserved for the inhabitants of that particular property. These elements vary depending on the site size, the land use and the overall scale.

Related to the concept of Spatial Hierarchy is that of Defensible Spaces that further enhances the relationship between space definition and safety. Defensible Spaces can be defined as areas where the hierarchy and transition from public to private space are be treated to enhance, among many other aspects, surveillance. Therefore, whereas space hierarchy merely refers to the distinction between public and private space, defensible spaces introduces the following (images) transitioning spaces.

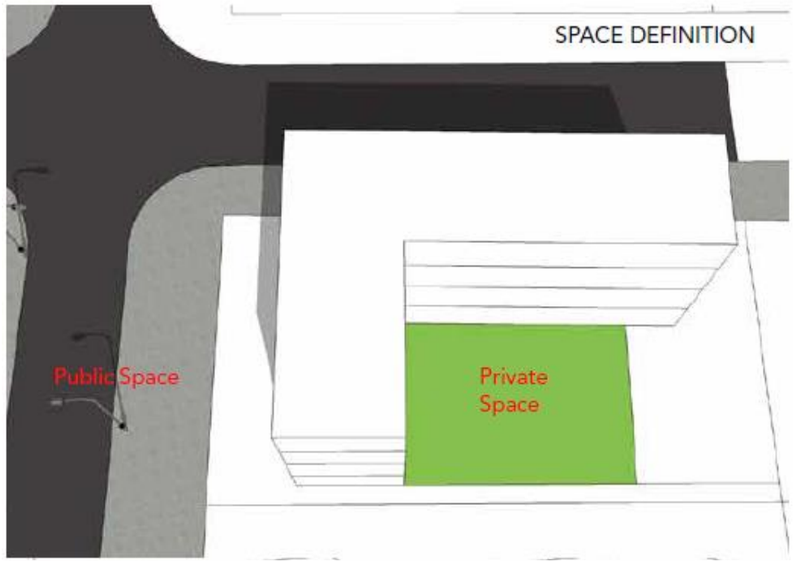
This consideration primarily concerns Site Specific design.

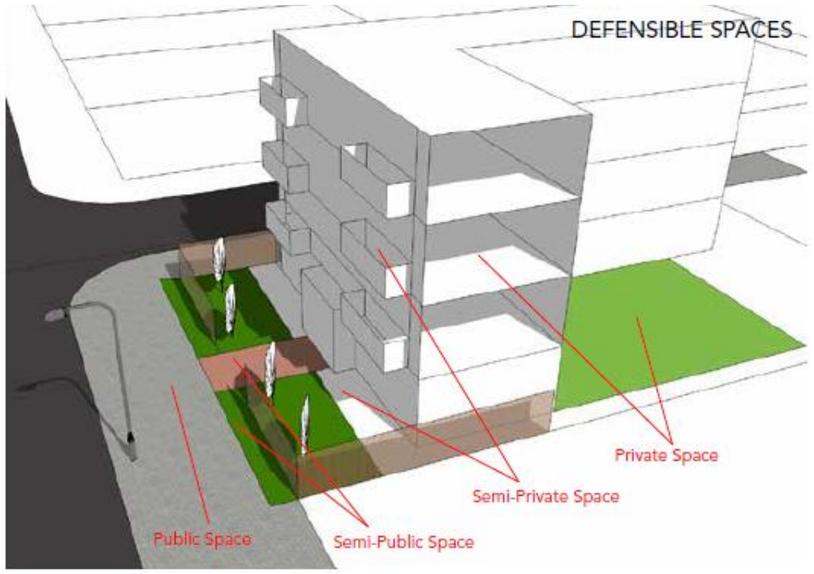
Site Implications

The Following elements are considered the primary spatial hierarchy indicators:

- Site layout that distinguishes and emphasizes private space (i.e. internal courtyards) vs public space (sidewalks and streets).
- The building edges (i.e. building walls along a built-to-line).
- Landscaping zones between the sidewalk space and the site open space.
- Perimeter fencing.

Related to the concept of Spatial Hierarchy is that of Defensible Spaces that further enhances the relationship between space definition and safety. Defensible Spaces can be defined as areas where the hierarchy and transition from public to private space are be treated to enhance, among many other aspects, surveillance. Therefore, whereas space hierarchy merely refers to the distinction between public and private space, defensible spaces introduces the following transitioning spaces.





The images above illustrates how the building acts and contributes towards the gradual change from public to private space. The in-between spaces (semi-public, semi-private) are deemed as functional components of the site and building utility and increases opportunity for street interaction. For example, within the semi-public space residents may engage in recreational activity. However, given the boundary treatment and placement in relation to the street, visual connection is made and hence surveillance over both spaces are created thereby increasing the general sense of awareness. Whereas anyone can access the public space (street), semi-public space may be reserved to the residents of the building only, or it may become 'controlled' public space. Semi-private space on the other hand typically takes the form of a balcony which can only be accessed by the resident of the unit themselves. Given the balcony orientation towards the street a visual connection to both public and semi-public space is created thus enhancing awareness by means of surveillance. Private space entails the interior of the unit itself and visual access from the street are absent. This is the most intimate space and provides privacy to residents. What is critical to note is that transition between public and private space is an essential component for defensible spaces and public safety.

d.) Edges

Description

Edges, broadly defined, is an essential element and design tool to enhance the overall accessibility of areas. Edges are often the physical barriers between areas that result in the creation of less penetrable regions (Lynch, 1960: 47). Lynch defines edges as the "…the boundaries between two phases, linear breaks in continuity…" (Lynch, 1960: 47) that can include building walls, topography, urban features and development edges.

Nodal Implications

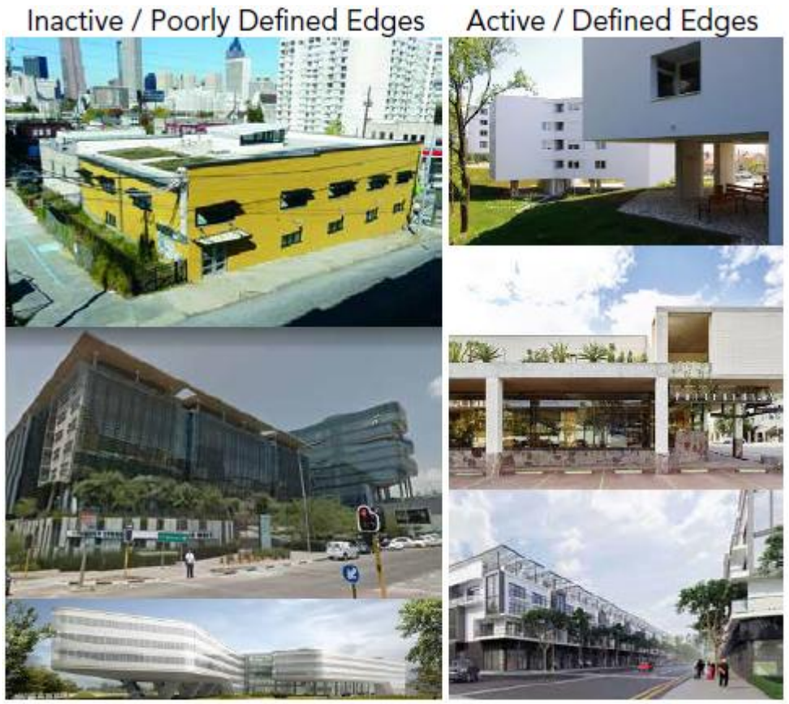
At a nodal scale, edges can be defined as the boundaries between different nodes. These boundaries require a 'stepping down' approach to ensure a more gradual and less obtrusive change in urban form and intensity. Reference should therefore be made to height & scale above. Other design elements to consider are the creation of gateways and landmarks along these edges to signal the entry and exist and transition between nodes.

Site Implications

Building edges are often defined as either 'active' or 'public'. This basically relates to whether the building wall / facade facing the street or public space (at ground floor particularly) is utilised for a use other than simply as part of the building envelope.

Active edges therefore refers to a mixed use typology that encourages and is somewhat dependent on interaction with, and access from, the public space (i.e. street). Such edges are particularly encouraged around transit nodes or public spaces such as parks or plazas and the extent of mix use being dependent on the local context.

Public edges on the other hand does not imply a mixed use typology per se, but rather that the design of the building facade / street facing wall is of such a nature that it allows for visual interaction with the street. This is typically and effectively achieved by the use of balconies, passage ways, unit orientation etc.



e.) Views and Vistas

Description

As briefly alluded to in the Area Character and Identity sub-section above, views and vistas play both an aesthetic as well as functional role. Views refer to sightlines that enhances the general awareness of space and contributes to the overall understanding and navigation of cities. These sightlines further informs the observer about his / her surroundings and may even contribute to safety as potential danger could be better anticipated based on the observer's visual interpretation of space. From a streetscape perspective, views are critical identity components as buildings often frame these views by way of orientation to maximise visual access to these views. In this respect views can often increase the perceived value of areas as areas with greater views are deemed more sought after. Vistas are similar to views in that it provides an opportunity to see beyond the immediate environment. However vistas specifically refers to building breaks to allow for these sightlines. From a functional perspective, vistas also contribute towards micro climate regulation in higher built up areas as it allows for natural light and air movement to flow more freely. This is particularly vital in the Inner City as it contributes to the overall liveability of the area.

Nodal Implications

From a nodal perspective is it essential for any new development to analyse and predetermine sightlines when larger scale planning and design is concerned. Views and vistas can greatly influence the actual spatial and structural configuration of nodal, precinct and neighbourhood areas. Significant sightlines to prominent geographic of built form elements therefore serve a vital hierarchy, ordering and scaling role. On a nodal scale views and vistas may be less strictly defined, but it remains a critical area planning tool / consideration.

Site Implications

Views and vistas have critical site implications as it affects the building orientation, design, materiality, access and circulation. The following external / off site factors influence site specific considerations:

- Public space: In order to enhance safety by means of passive surveillance, site design needs to consider and factor in the locality and relation of surrounding public spaces to the site. Public spaces in this regard not only includes streets, but also parks, plazas and squares. Vistas would enhance visual and physical access and connectivity to these spaces.
- Heritage: Heritage site comprise of both buildings themselves as well as historic views. In both instances site development ought to be adapted to respect and even enhance these sites & sights. In certain areas strict heritage guidelines ought to be adhered to as established by the relevant heritage regulatory authority. It is however also the opinion and recommendation of this Nodal Review that heritage preservation should be balanced with spatial transformation and hence should not become barriers to redevelopment of critical areas. Therefore alternative and progressive design needs to be applied to respect heritage structures, but balance the need for development. As mentioned before, heritage cannot be utilised as a proxy for transformation resistance.
- Microclimate: In Inner City or other built up areas where increased heights are encouraged, vistas play a critical role to ensure that public spaces (streets, sidewalks, plazas, squares) do not become dark, cold areas due to structures blocking natural sun light and air circulation. Building breaks, recesses and materiality is therefore a critical consideration in this regard.

f.) Interfaces between Nodes or Development Zones, and when erven cross zones

The interface zone between nodes refer to the areas immediately located along both sides of the nodal boundary. These areas often serve challenges to the proposed gradual change in land scape and built form as one development zone may have significantly higher development rights as the neighbouring zone. This could translate into inappropriate scale and intensity differences on sites next to one another. Therefore it is critical to carefully consider these areas and find a suitable balance in terms of development rights and controls between the different nodal hierarchies. In most instances the very nature of the nodal allocation would resolve such challenges as the hierarchies are aligned to the urban transect model. For instance the Inner City Core is predominately surrounded by the Metropolitan Node with the Metropolitan Node abutting the Regional Node. In terms of the permissible development rights and controls this transition from a higher order to lower order node is already facilitated by means of nodal specific development control. However, in some areas the Inner City Node boundary directly abuts the Regional Node and therefore a 'leap' in development intensity is made. In these instances a transition area would need to be established to serve as a step down from the higher order to lower order node. In terms of heights this is done via the 2 storey restriction where properties within this transition zone are not permitted to exceed more than 2 storeys of the maximum attainable height of the lower order node. For other development controls such as coverage, density etc. such a general measure is not feasible and hence should be considered and motivated on a site specific basis.

Given the nature of the nodal boundary delineations that are based on accessibility criteria, it may often be the case that properties fall within two different nodal areas. These properties should be regarded as falling within the interface zone and hence the height restriction as above should be implemented. Aside from height restriction, the general rule for determining within which nodal hierarchy a property falls is to establish where physical site access is located. If the property access falls within the higher order node, the base rights that can be applied for would be the rights applicable to the higher order node, and vice versa. It should however be noted that all properties that are affected by two (or more) nodes should be dealt with and considered on a site- and context specific basis. Surrounding land uses, geographic conditions and distance to public amenities, including transit, would then be utilised to determine the ultimate permissible development rights.

3.1.5. Large New Township Establishments in the Peri-Urban and Sub-urban zones

The SDF 2040 and this Nodal Review favour infill development (within existing townships) over new township development on vacant land (mostly in the Peri-Urban, but also in some cases, suburban zones). For example, the SDF reads:

> *"The development approach focusses on infill and redevelopment (brown field[6]) in favour of green-field development" (City of Johannesburg, 2016, p. 72)*

Having said this, there are "pockets of under-utilised, well located pieces of land within the urban structure" (City of Johannesburg, 2016, p. 49) including (but not necessarily limited to) Frankenwald, Modderfontein and Linbro Park. If developed with adequate connections to the surrounding built form[7], appropriate densities, land use mix and access to amenities, these could become vibrant, liveable, efficient and valuable parts of the City.

As such, new township establishments in the Peri-Urban and Suburban zones will be considered but must be preceded by a Council approved Precinct Plan, Urban Design Framework, or Strategic Area Framework to guide the development[8]. These plans should be in line with the precinct plan formulation guidelines, available from City Transformation and Spatial Planning. The plans should include environment, heritage, transport and infrastructure considerations, with studies done and infrastructure provided where required.

These plans will only be considered and approved if they meet the ideals of the SDF 2040, with the Urban Performance Measures and Guidelines (section 8.3 of the SDF) playing an important guiding role.

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[6] Brown field land, in this document [SDF 2040], refers to developed or undeveloped land within the existing urban fabric of the city. Brown field development refers to the refurbishing of buildings, demolition and re-development, or development of unused land in the existing urban fabric (within existing townships).

[7] Especially in terms of public transport.

[8] These would usually be produced, in close consultation with City Transformation and Spatial Planning, by owners/developers of the land in question.

4. Residential Densities

As mentioned in section 1.3.1, the densities table from the SDF 2040 will still apply, with the boundaries of nodes and development zones updated by this document. The table below indicates how the densities table in the SDF should apply to the development zones in the Nodal Review. This section also introduces the residential densification index and associated density ranges, calculated for this Nodal Review.

4.1. Residential Densities and the SDF Densities Table

Except within TOD buffers as per the SDF 2040, minimum densities should not be enforced, but are encouraged. In consent use applications, no minimum densities will be enforced. Minimum does however mean that there is no maximum, as long as dwelling units conform to building regulations and the relevant land use scheme, and that development controls are adhered to (height, coverage, FAR, unit size, etc.). This is to allow developers to build smaller, and thus more affordable units in well located areas (Inner City Node, Metropolitan Nodes, District Nodes and the General Urban Zone).

Table 10 below simply indicates how the new Node and Development Zone delineations from this document, relate to the densities table from the SDF 2040.

Table 10: Nodes and Development Zones and the SDF 2040 Density Table

Name	Density (see Table 11 for reference)
1: Inner City Node	As per "CBD" in the SDF 2040;
2: Metropolitan Nodes	As per "Metropolitan Nodes" in the SDF 2040
3: Regional Nodes	As per "Regional Nodes" in the SDF2040
4: General Urban Zone	As per "District/Specialist Nodes" in the SDF 2040
4a: Local Economic Development Zones	As per "District/Specialist Nodes" in the SDF 2040
5: Sub-urban Zone	As per "All existing single dwelling and low density residential areas outside of Transformation Zone, nodes, nodal buffers (defined below) and TOD nodes" In the SDF 2040; read in conjunction with the residential density index from this document.

6: Agricultural/Peri-Urban	As per "All existing single dwelling and low density residential areas outside of Transformation Zone, nodes, nodal buffers (defined below) and TOD nodes" In the SDF 2040; read in conjunction with the residential density index from this document.
6: Beyond the Urban Development Boundary	N/a. Densification not supported.

4.2. Residential Density Index

As a part of this Nodal Review, along with the Nodal Review index itself, a second index was calculated for residential densification. This index is also based on urban potential: local access to amenities from schooling, to parks, public transit, healthcare and areas where the city is investing. The full explanation of the index is available in 'Annexure 4: Urban Potential Modelling Method' and at the following link: **www.bit.ly/nodal-council**

The need for the residential density index has arisen from the SDF and from sometimes skewed implementation of density in different parts of the city, as described earlier in the document. It also rises from the section of the SDF densities table relating to "All existing single dwelling and low density residential areas outside of Transformation Zone, nodes, nodal buffers (defined below) and TOD nodes" included in the SDF densities table (Table 11) below.

That section of the SDF densities table calls for an interpretation on access to "economic activity; public transit; public open space; social infrastructure (health, education, public facilities); the potential to address deprivation area challenges and the surrounding built form" and gives guide densities, indicating that these can be deviated from if access to amenities is good.

The residential densification index gives a standard interpretation of the above, comparing all hexagons in the model equally on access to a range of amenities. This index (on a scale of 0 to 1) was converted into density ranges, with the explanation of the calculations available in Annexure 4: Urban Potential Modelling Method. The map below indicates the proposed densities across the City, with more detailed maps available at:

http://bit.ly/nodal-council

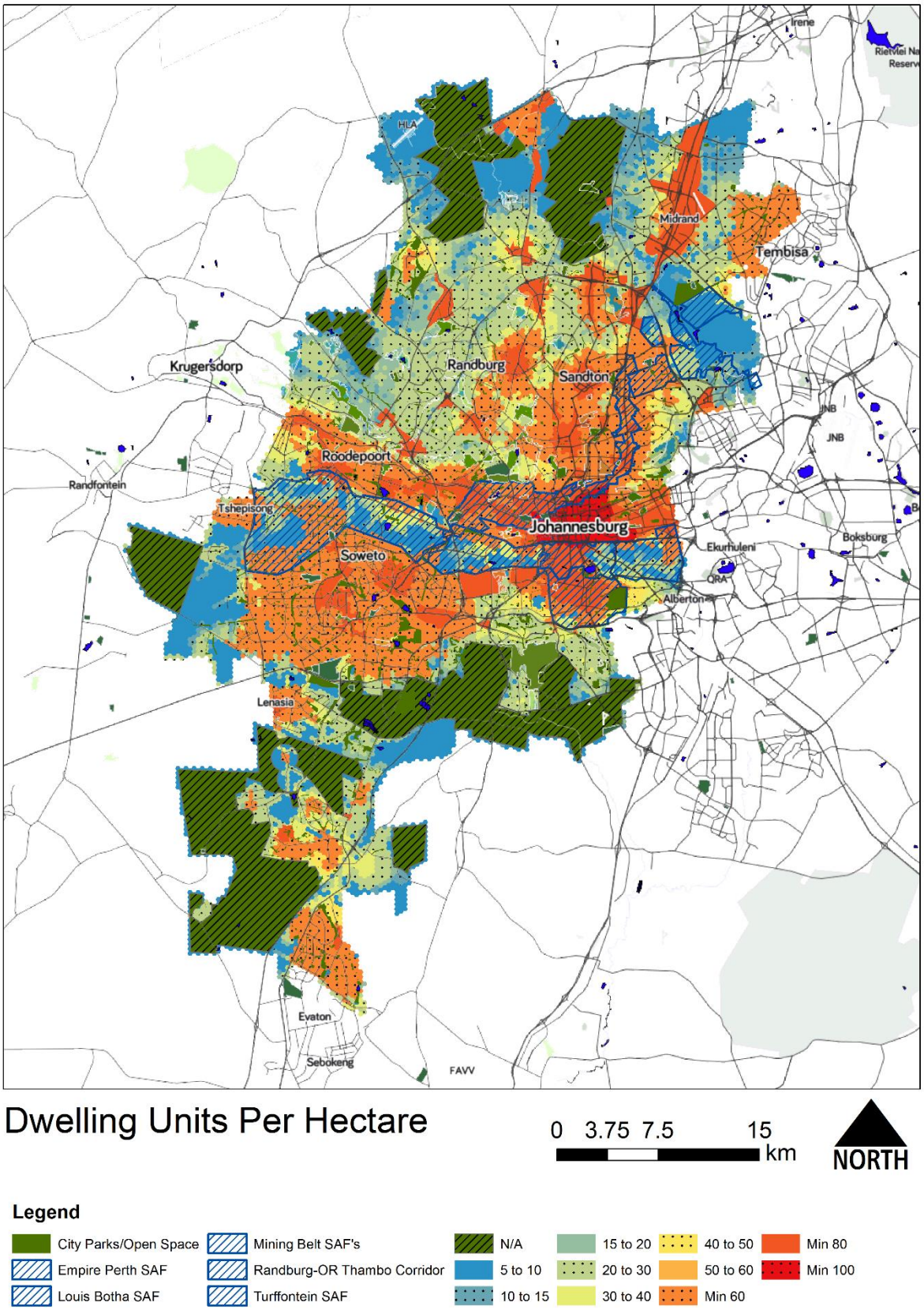

Figure 8: Residential Densities for Nodes and Development Zones

Table 11: SDF 2040 Densities Table including "Consolidation Zone" for reference

SDF DENSITIES TABLE FOR EASY REFERENCE Target Locations/Spatial Elements		Density Regulations Housing Density (per erf)[9] (du = dwelling units)
1 Transformation Zone	Inner City	Urban node guideline for CBD to apply (see below)
	Corridors of Freedom	Apply public transport density and Corridors of Freedom guidelines
	Soweto	Subject to provisions and guidelines emanating from approved Strategic Area Frameworks to be developed Guide Density: 40 du/ha
	Mining Belt	
	Randburg- OR Tambo Corridor	Minimum: 60 du/ha
2 Consolidation Zone	Deprivation Areas/ (Re) Urbanisation Focus	To be determined per proposal - an urban design/typology issue and not a density issue. It will therefore be dealt with by the development control indicators outlined in this SDF. Guide Density: 50 du/ha
	All existing single dwelling and low density residential areas outside of Transformation Zone, nodes, nodal buffers (defined below) and TOD nodes.	To be based, per individual application, on access to: economic activity; public transit; public open space; social infrastructure (health, education, public facilities); the potential to address deprivation area challenges and the surrounding built form. Allowable erf size to be assessed per individual application. Guide density: 20 Du/ha Height: not more than one story higher than adjacent built form.
	Mobility Spines/Corridors: The fact that a property abuts a mobility spine or corridor (as defined in current RSDF's) will no longer be supported as a stand-	To be based, per individual application, on access to: economic activity and jobs; public transit; public open space; and social infrastructure (health, education, public facilities) and on surrounding built form.

[9] Where mixed uses are present in individual buildings or properties, housing density (du/ha) will be proportionally calculated. For example, if residential use makes up 80% of the development's floor area, the number of residential units should be divided by 80% of the property area to achieve du/ha.

SDF DENSITIES TABLE FOR EASY REFERENCE Target Locations/Spatial Elements		Density Regulations Housing Density (per erf)[9] (du = dwelling units)
	alone (sole) rationale for densification.	
3 **Nodes**	Within CBD	Minimum: 100 du/ha
	Within Metropolitan/ Regional Nodes	Minimum: 80 du/ha
	Within 500m walking distance[10] of CBD	Minimum: 80 du/ha
	Within 100m walking distance of a Metropolitan/Regional Node	Minimum: 60 du/ha Maximum: 120 du/ha
	Within District nodes/Specialist nodes	Minimum: 60 du/ha
	Within 100m walking distance of District nodes/ Specialist nodes	Minimum: 50 du/ha Maximum: 100 du/ha
	Within Neighbourhood Nodes	Guide Density: 40 du/ha
4 **Transit Oriented Development Nodes**	Within 500m walking distance of Rea Vaya /BRT bus stations.	Minimum: 60 du/ha (Subject to provisions and guidelines emanating from approved Strategic Area Frameworks that exist)
	Within 500m walking distance of Gautrain stations, PRASA rail stations	Minimum: 60 du/ha (Subject to provisions and guidelines emanating from approved Strategic Area Frameworks that exist)

[10] Walking distance is by *public* road or *public* walkway, not 'as the crow flies'.

5. Reference List

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CATS. (2013). *The Transect*. Retrieved December 15, 2017, from Center for Applied Transect Studies: https://transect.org/index.html

City of Johannesburg. (2016). *Spatial Development Framework 2040.* Retrieved October 21, 2016, from City of Johannesburg: http://bit.ly/cojcitywide

Harrison, P., Bobbins, K., Culwick, C., Humby, T.-L., La Mantia, C., Todes, A., & Weakley, D. (2014). *Urban Resilience Thinking for Municipalities.* Retrieved October 7, 2015, from Wits WiredSpace: http://bit.ly/resiliencereport

6. Annexure 2: Summary of Public Participation

Throughout the process of this nodal review, public participation has taken place. The table below summarises the process followed.

Item	Summary	Dates
Call for public input/ideas	A call was publically made to solicit public comments and suggestions for the nodal review	7th of October 2016, with a deadline for submissions on the 11th of December 2016
Regional public participation meetings and online sharing of draft urban potential model, and.	The draft model for the nodal review was shared online at http://bit.ly/nodemaps and the presentation made in each meeting is available at http://bit.ly/nodalreview1	Published online: 10 August 2017 Region A: 26 July 2017 Region B: 19 July 2017 Region C: 21 July 2017 Region D: 20 July 2017 Region E: 26 July 2017 Region F: 28 July 2017 Region G: 1 Aug 2017
Collation of public inputs	All of the written inputs received from items 1 and 2 above were mapped (in GIS where applicable) and summarised into a table.	11 December 2016 to 1 December 2017
Internal participation of first draft with Land Use Department	The proposed development zones and nodal delineations were internally workshopped with the Land Use department in the CoJ. Results were summarised into a single document.	Region E: 18 Oct 2017 Northcliff and Surrounds: 18 Oct 2017 C1, Northcliff and Auckland Park: 19 Oct 2017 Region F: 3 Nov 2017

		Region A: 17 Oct 2017 Region C: 10 Nov 2017
Advertisement of Draft Nodal Review for Public Comment (60 days commenting period)	All documents available at: **http://bit.ly/nodal_rev_files**	28 February 2018
Public Participation During Public Commenting Period	Here, three public sessions were held in Sandton, Braamfontein and Jabulani, Soweto. The public was invited to sessions where all of the maps from the draft nodal review were presented, and questions and public comments were welcomed.	**Saturday 7 April, 2018, 10am to 12pm** **Jabulani Civic Centre,** 1 Koma St, Jabulani, Soweto **Sandton Region E Offices,** Training Room, 137 Daisy Street, Sandton **Metro Centre,** Level A Lecture Room, 158 Civic Boulevard Braamfontein
Collation of public inputs received, and resulting (final) amendments of the policy	Summary of public comments received is available at **www.bit.ly/nodal_council**	1 July to 20 September 2018

7. Annexure 3: Summary of Public comments

Available for download at: **www.bit.ly/nodal-council**

8. Annexure 4: Urban Potential Modelling Method

Available for download at: **www.bit.ly/nodal-council**

9. Annexure 5: Anchorville Properties removed from "Beyond the UDB"

Erf	Township/Farm	Current Zoning
44/4	ANCHORVILLE	Special
45/4	ANCHORVILLE	Special
585	ANCHORVILLE EXT.8	Commercial 1
587	ANCHORVILLE EXT.8	Commercial 1
588	ANCHORVILLE EXT.8	Commercial 1
589	ANCHORVILLE EXT.8	Commercial 1
594	ANCHORVILLE EXT.8	Commercial 1
595	ANCHORVILLE EXT.8	Commercial 1
596	ANCHORVILLE EXT.8	Commercial 1
597	ANCHORVILLE EXT.8	Commercial 1
581	ANCHORVILLE EXT.8	Commercial 1
582	ANCHORVILLE EXT.8	Commercial 1
42/4	ANCHORVILLE	Special
43/4	ANCHORVILLE	Special
605	ANCHORVILLE EXT.9	Commercial 1
613	ANCHORVILLE EXT.9	Commercial 1
616	ANCHORVILLE EXT.9	Commercial 1
621	ANCHORVILLE EXT.9	Commercial 1
622	ANCHORVILLE EXT.9	Commercial 1
600	ANCHORVILLE EXT.9	Commercial 1
601	ANCHORVILLE EXT.9	Commercial 1
604	ANCHORVILLE EXT.9	Commercial 1
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607	ANCHORVILLE EXT.9	Commercial 1
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586	ANCHORVILLE EXT.8	Commercial 1
590	ANCHORVILLE EXT.8	Commercial 1
591	ANCHORVILLE EXT.8	Commercial 1
592	ANCHORVILLE EXT.8	Commercial 1
593	ANCHORVILLE EXT.8	Commercial 1
580	ANCHORVILLE EXT.8	Commercial 1

583	ANCHORVILLE EXT.8	Educational
602	ANCHORVILLE EXT.9	Commercial 1
603	ANCHORVILLE EXT.9	Commercial 1
609	ANCHORVILLE EXT.9	Commercial 1
611	ANCHORVILLE EXT.9	Commercial 1
618	ANCHORVILLE EXT.9	Commercial 1
619	ANCHORVILLE EXT.9	Commercial 1
620	ANCHORVILLE EXT.9	Commercial 1
623	ANCHORVILLE EXT.9	Commercial 1
624	ANCHORVILLE EXT.9	Commercial 1
127/4	ANCHORVILLE	Special
627	ANCHORVILLE EXT.9	Commercial 1
628	ANCHORVILLE EXT.9	Commercial 1
188/302-IQ	ROODEPOORT 302-IQ	Agricultural
185/302-IQ	ROODEPOORT 302-IQ	Agricultural
184/302-IQ	ROODEPOORT 302-IQ	Agricultural
187/302-IQ	ROODEPOORT 302-IQ	Agricultural
199/302-IQ	ROODEPOORT 302-IQ	Agricultural
RE/183/302-IQ	ROODEPOORT 302-IQ	Agricultural