5.4.2. BUSINESS ACTIVITY

It is important that land use strategies are developed that recognize the need to stimulate economic growth and job creation within Emfuleni. These land use strategies must focus institutional support and private sector spending to achieve the aforementioned. In turn, this will create economic potential and provide opportunities for local communities to participate in local economic development.

5.4.2.1. BUSINESS CENTRE HIERARCHY

Business activities should be concentrated, rather than dispersed in order to stimulate the viability of these activities. To achieve this, business activity should be clustered within nodes. The following Table provides the proposed composition of each business node within the business node hierarchy proposed for Emfuleni.

a. Primary node (CBDs)

A primary node is a node of city-wide significance and can therefore develop a strong retail, entertainment and office component. The retail component can accommodate 2 or more regional shopping centres or retail floor area equaling that of two regional shopping centres. The entertainment component should include entertainment venues of municipal significance. A primary node can accommodate a large office component, providing office space for large-scale businesses.

b. Secondary / Regional node

A secondary / regional business node can accommodate a regional shopping centre and two or more community shopping centres or retail floor area equaling that of a regional shopping centre and two or more community shopping centres. In addition, a secondary / regional node can accommodate entertainment venues of regional significance. The office component can provide office space for medium-scale businesses.
c. Community node

A community node will require a community shopping centre and two or more neighbourhood shopping centres, or a total retail area similar to that of a community shopping centre and two or more neighbourhood shopping centres. In addition, a district business node can accommodate local entertainment venues, as well as a cluster of office buildings catering for local, small-scale businesses.

### TABLE 28: BUSINESS CENTRE SIZE AND COMPOSITION

<table>
<thead>
<tr>
<th>Node hierarchy</th>
<th>Total retail area</th>
<th>Total office area</th>
<th>Minimum trade area</th>
<th>Minimum access requirements</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary node (CBDs)</td>
<td>&gt;80,000m²</td>
<td>10,000m²+</td>
<td>8km</td>
<td>Access to freeway, arterial and major public transport route</td>
<td>Two or more regional shopping centres Entertainment venues of municipal significance Cluster of office buildings catering for large-scale businesses</td>
</tr>
<tr>
<td>Secondary / Regional node</td>
<td>25,000 -75,000m²</td>
<td>10,000-20,000m²</td>
<td>4km</td>
<td>Access to arterial and major public transport route</td>
<td>A regional shopping centre and two or more community shopping centres Entertainment venues of regional significance, Cluster of office buildings catering for medium-scale businesses</td>
</tr>
<tr>
<td>Community node</td>
<td>&lt;30,000m²</td>
<td>&lt;10,000m²</td>
<td>2km</td>
<td>Access to major collector road and public transport route</td>
<td>A community shopping centre and two or more neighbourhood shopping centres Entertainment venues of local significance Cluster of office buildings catering for small-scale businesses</td>
</tr>
</tbody>
</table>

Source: Spatial Planning Section, Emfuleni Local Municipality, 2013
5.4.2.2. Business Centre Development

To ensure the viability of proposed business activities within Emfuleni, it is important to (a) link the business areas proposed for Emfuleni to the Land Use Budget, and (b) develop a retail hierarchy to ensure the orderly and logical development of retail facilities within Emfuleni. The Table below provides a list of the proposed business nodes and the retail and office space that can be support by Emfuleni within each of these nodes.

**TABLE 29: PROPOSED RETAIL AND OFFICE FLOOR AREA ALLOCATION (2010-2020)**

<table>
<thead>
<tr>
<th>Node</th>
<th>Node Classification</th>
<th>Allocation 2010-2020 ha</th>
<th>Allocation 2010-2020 m²</th>
<th>Existing 2010 ha</th>
<th>Existing 2010 m²</th>
<th>Available 2010-2020 ha</th>
<th>Available 2010-2020 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanderbijlpark CBD</td>
<td>Primary</td>
<td>65.0</td>
<td>260052</td>
<td>65.0</td>
<td>260052</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Retail (0% of total)</td>
<td></td>
<td>50.0</td>
<td>200040</td>
<td>50.0</td>
<td>200040</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Private Office (0% of total)</td>
<td></td>
<td>15.0</td>
<td>60012</td>
<td>15.0</td>
<td>60012</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Vereeniging CBD</td>
<td>Primary</td>
<td>132.8</td>
<td>531284</td>
<td>132.8</td>
<td>531284</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Retail (0% of total)</td>
<td></td>
<td>102.2</td>
<td>408680</td>
<td>102.2</td>
<td>408680</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Private Office (0% of total)</td>
<td></td>
<td>30.7</td>
<td>122604</td>
<td>30.7</td>
<td>122604</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Sebokeng CBD</td>
<td>Primary</td>
<td>22.3</td>
<td>89123</td>
<td>10.3</td>
<td>41180</td>
<td>12.0</td>
<td>47943</td>
</tr>
<tr>
<td>Retail (20% of total)</td>
<td></td>
<td>19.5</td>
<td>78059</td>
<td>10.3</td>
<td>41180</td>
<td>9.2</td>
<td>36879</td>
</tr>
<tr>
<td>Private Office (20% of total)</td>
<td></td>
<td>2.8</td>
<td>11064</td>
<td>0.0</td>
<td>0</td>
<td>2.8</td>
<td>11064</td>
</tr>
<tr>
<td>Bedworthpark</td>
<td>Secondary / Regional</td>
<td>13.3</td>
<td>53364</td>
<td>10.6</td>
<td>42300</td>
<td>2.8</td>
<td>11064</td>
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<tr>
<td>Retail (0% of total)</td>
<td></td>
<td>10.6</td>
<td>42300</td>
<td>10.6</td>
<td>42300</td>
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<tr>
<td>Private Office (20% of total)</td>
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<td>11064</td>
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<td>0</td>
<td>2.8</td>
<td>11064</td>
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<tr>
<td>Evaton</td>
<td>Secondary / Regional</td>
<td>12.4</td>
<td>49551</td>
<td>6.4</td>
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<td>23971</td>
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<td>Retail (10% of total)</td>
<td></td>
<td>11.0</td>
<td>44020</td>
<td>6.4</td>
<td>25580</td>
<td>4.6</td>
<td>18440</td>
</tr>
<tr>
<td>Private Office (10% of total)</td>
<td></td>
<td>1.4</td>
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</tr>
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<td>Mantevrede</td>
<td>Secondary / Regional</td>
<td>20.7</td>
<td>82837</td>
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<td>6.7</td>
<td>26737</td>
</tr>
<tr>
<td>Retail (10% of total)</td>
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<td>18.6</td>
<td>74540</td>
<td>14.0</td>
<td>56100</td>
<td>4.6</td>
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</tr>
<tr>
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<td>8298</td>
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<td>2.1</td>
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## Node Classification

<table>
<thead>
<tr>
<th>Node</th>
<th>Node Classification</th>
<th>Allocation 2010-2020</th>
<th>Existing 2010</th>
<th>Available 2010-2020</th>
</tr>
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<tr>
<td></td>
<td>ha</td>
<td>m²</td>
<td>ha</td>
<td>m²</td>
</tr>
<tr>
<td>Sonlandpark</td>
<td>Secondary / Regional</td>
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<tr>
<td>Retail (20% of total)</td>
<td>9.2</td>
<td>36879</td>
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<tr>
<td>Private Office (10% of total)</td>
<td>1.4</td>
<td>5532</td>
<td>0.0</td>
<td>0</td>
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<tr>
<td>Three Rivers</td>
<td>Secondary / Regional</td>
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<td>3.9</td>
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<td>Bottumelo</td>
<td>Community</td>
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<tr>
<td>Retail (10% of total)</td>
<td>4.6</td>
<td>18440</td>
<td>0.0</td>
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</tr>
<tr>
<td>Private Office (5% of total)</td>
<td>0.7</td>
<td>2766</td>
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</tr>
<tr>
<td>Kwaggastroom</td>
<td>Community</td>
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<td>Retail (10% of total)</td>
<td>4.6</td>
<td>18440</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Private Office (5% of total)</td>
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<td>Lochvaal</td>
<td>Community</td>
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<td>Retail (10% of total)</td>
<td>4.6</td>
<td>18440</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Private Office (5% of total)</td>
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<td>2766</td>
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<td>0</td>
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<td>Residentia</td>
<td>Community</td>
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</tr>
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<td>0.0</td>
<td>0</td>
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<tr>
<td>Private Office (5% of total)</td>
<td>0.7</td>
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<td>0.0</td>
<td>0</td>
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<td>Roshnee</td>
<td>Community</td>
<td>3.0</td>
<td>11986</td>
<td>0.0</td>
</tr>
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<td>Retail (5% of total)</td>
<td>2.3</td>
<td>9220</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Private Office (5% of total)</td>
<td>0.7</td>
<td>2766</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>316.0</strong></td>
<td><strong>1263914</strong></td>
<td><strong>256.1</strong></td>
<td><strong>1024200</strong></td>
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<tr>
<td>Retail</td>
<td>252.6</td>
<td>1010355</td>
<td>206.5</td>
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<td>63.4</td>
<td>253559</td>
<td>49.6</td>
<td>198240</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2012
Figure 27 illustrates the location of the exiting and proposed primary, secondary / regional and community business nodes identified within Emfuleni. A total of 3 primary business nodes exist within Emfuleni. These primary business nodes comprise the existing Vanderbijlpark CBD, the existing Vereeniging CBD and the emerging Sebokeng CBD. The retail and office space existing within the Vanderbijlpark CBD and the Vereeniging CBD is deemed sufficient, so no additional retail and office space is provided. However, an additional 36,879m² of retail space and 11,064m² of office space is allocated to the Sebokeng CBD to further strengthen this emerging Central Business District.

A secondary / regional business nodes and community business nodes have been identified within Emfuleni, of which some of them are newly proposed nodes: Sonlandpark, Boitumelo, Kwaggastroom, Roshnee and Lochvaal. Retail and office space has been allocated to each of these nodes in accordance with the needs of the surrounding urban environment, the nature of its potential consumer base, and the location characteristics of each node. Based on these nodal characteristics, the following regional business nodes need mention:

a. Sonlandpark node

This node is a regional business node located on the urban corridor proposed along the Vereeniging-Johannesburg commuter railway line. Thus, creating a node with a substantial retail and office component can greatly contribute to the establishment of this corridor. A total 36,879m² of retail space and 5,532m² of office space is allocated to the Sonlandpark node.

b. Bedworthpark node

This regional business node not only serves the surrounding residential areas, such as Sharpville, but it also functions as a ‘gateway’ into the Vanderbijlpark area via the K174 (Barrage Road). A large office component was therefore provided to fully utilize the ‘entrance’ characteristics of this node. An additional 13,830m² of office space is allocated to the Bedworthpark node, which can be allocated along Barrage Road. No additional retail space is allocated to this node due to the large retail centres already existing within this node.

c. Evaton node

This node has the potential to increase its role in serving the northern parts of Sebokeng and Evaton. It is therefore proposed that this node be significantly strengthened to a regional business node. An additional 18,440m² of retail space and 5,532m² of office space is allocated to the Evaton Node.
In addition to the above, it is recommended that the granting of additional retail space within Emfuleni also be done based on the recommendations of a detailed retail study that accompanies each individual application for retail rights within Emfuleni. In turn, such a detailed retail study must be conducted in a manner that adheres to the objectives and guidelines set out in this Emfuleni SDF, especially with regard to the distribution of retail space between the various nodes. In other words, a single node should not be allocated a disproportionate amount of retail space that would be to the detriment of other nodes.

5.4.3. COMMUNITY FACILITIES

Residential development requires the support of other land use types, such as schools and clinics, in order to create complete and sustainable residential environments. Such community facilities must be located in such a way that they are accessible to the residential communities they serve. This is best achieved using the community nodes proposed for Emfuleni, which will cluster these community facilities in central locations.

5.4.3.1. COMMUNITY FACILITY HIERARCHY

The composition of each community node within the nodal hierarchy must contain community facilities that are suited to the function of that particular node within the nodal hierarchy. The proposed composition of each community node within the nodal hierarchy is depicted in the Table below and should serve as a guideline for the design and development of these nodes.

a. Municipal community node

A municipal community node, providing higher-order community services, serves a region within the municipal area. With regard to educational facilities, a municipal node should accommodate a region’s tertiary educational facilities, as well as a number of primary and secondary schools. With regard to health care, the municipal community node should provide the region’s hospital(s), as well as other higher-order and specialized medical facilities. Other community facilities to be provided in such a node include a large community hall, police station and emergency service centre. These facilities are all highest-order facilities when compared to similar facilities provided in lower-order nodes.
b. Regional community node

A regional community node should serve a number of suburbs and should provide medium-order community services to the suburbs they serve. A regional node should at least comprise a secondary school, 2 primary schools, a community centre and a library. It can also accommodate a day hospital and a police station, only on a slightly smaller scale than those provided in a municipal community node.

### TABLE 30: COMMUNITY FACILITY COMPOSITION

<table>
<thead>
<tr>
<th>Nodal Hierarchy</th>
<th>Service Area Radius</th>
<th>Size</th>
<th>Proposed composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal community node</td>
<td>8km</td>
<td>30ha</td>
<td>1 tertiary education facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 secondary schools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 primary schools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 hospital</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 large-scale post office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 large-scale library</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 large-scale community hall</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 large-scale police station</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 emergency service centre</td>
</tr>
<tr>
<td>Regional community node</td>
<td>4km</td>
<td>20ha</td>
<td>2 secondary schools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 primary schools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 day hospital</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 medium-scale post office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 medium-scale library</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 medium-scale community hall</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 small-scale police station</td>
</tr>
<tr>
<td>District community node</td>
<td>1-2km</td>
<td>15ha</td>
<td>1 secondary schools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 primary schools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 clinic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 small-scale post office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 small-scale library</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 small-scale community hall</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2012
c. District community node

District community nodes should provide low-order community services within a suburb. A district node should at least comprise a secondary school and a primary school, but can also contain a clinic and a post office.

5.4.3.2. Community Facility Development

The Land Use Budget (Section 3) calculated the number of community facilities required within Emfuleni to support the envisaged population increase within Emfuleni. The regional community nodes should preferably be placed at existing or proposed regional business nodes to allow for the development of a one-stop-shop land use arrangement. The locations of district community nodes must be identified during the township establishment. The guiding principle in this case should be to place district nodes centrally within existing or planned residential neighbourhood to allow these nodes to be within walking distance of the households living within these neighbourhoods. In doing so, these nodes can become the focal points around which residential neighbourhoods can be develop. District community nodes must contain district-level community facilities, such as schools and clinics.

In order to develop the community infrastructure required within Emfuleni, Emfuleni will have to work in close relationship with the Provincial governmental bodies concerned with the development and management of community facilities, such as the Gauteng Department of Health and Welfare, and the Department of Education. The responsibility of the Emfuleni will be to ensure that the necessary stands for community facilities are provided and that these stands are strategically placed within nodal areas. The construction and management of the relevant buildings will be the responsibility of the provincial government departments concerned.

Providing community facilities within small holding areas that are being converted into higher-density cluster developments are often problematic. One of the reasons for this is the fact that individually, the cluster developments do not reach the threshold for providing any community facilities. However, collectively, these cluster developments develop large numbers of housing units, without any of these cluster developments being required to provide stands for schools or stands for other type of community facility. The result is that these small holding areas lack the most basic community facilities, such as schools and clinics.
Considering the fact that much of the land within Emfuleni that is set aside for urban expansion comprises small holding, such as Unitas Park, Lochvaal Barrage and Mantevrede, poses the danger that township establishment on these smallholding do not yield the necessary household thresholds to enforce developers to provide community facilities, such as schools. Should this be the case, it is proposed that Emfuleni pro-actively identifies properties that are suitable for the location of community nodes within these small holding areas. Emfuleni will need to purchase these properties and develop the community facilities on these propriety when urban expansion within the vicinity of these properties necessitates the development of such facilities.

To address the situation mentioned above, it is proposed that developers of cluster housing on small holdings be required to provide contributions for the purchasing of stands for community facilities, much in the same way that developers make bulk services contribution. These funds will have to be ring-fenced and used by the municipality to purchase land (small holdings) for the development of community nodes. Because the availability of land for sale is unknown, the exact location of these community nodes can only be determined during the purchasing phase.

### 5.4.4. OPEN SPACE & RECREATION

Open space and recreation within Emfuleni can be divided into 2 categories: passive and active open space. Passive open space consists of land that is unsuitable or undesirable for urban development due to topographical, ecological constraints or for flood protection. Active open space involves the recreational component of the open space system. It provides parks and sport facilities throughout an urban area for use by residents, local sports clubs and schools. Passive open space was dealt with in a previous section of this report and active open space is dealt with below.

#### 5.4.4.1. ACTIVE OPEN SPACE DEVELOPMENT PRINCIPLES

Formulating principles for the development of active open spaces can help ensure that standards of quality and usefulness are achieved in the planning, design and management of such spaces. The following development principles need to be taken into account when developing active open spaces:
a. Linking a use to open space

Active open spaces (or parks) that do not have a deliberate use linked to them are often not of value to a local community and often become dumping ground as a consequence. It is therefore imperative that a use be linked to an active open space to ensure the utilization of these spaces. One of the best ways of utilizing active open spaces within urban areas is to develop recreational facilities or sports facilities on these spaces.

b. Type of facilities provided

When planning active open spaces, it is important that appropriate recreation (or sport) facilities are provided. Often recreational facilities are provided that do not fulfill the needs of the community, usually because they are not the preferred recreational types. To prevent the provision of inappropriate recreational facilities, the recreational preferences of a local community must be established before planning and developing a recreational facility.

c. Maintenance of active open spaces

An important factor in determining the success of active open spaces is the maintenance thereof. Past experience has proved that active open spaces that are not maintained often lose their practical value to local residents. Therefore, it can be argued that larger and fewer active open spaces that are maintained are more useful than smaller, more numerous active open spaces that are not.

d. Accessibility of active open spaces

When locating active open spaces, it is important to ensure that these spaces are accessible to the community it serves. This implies locating an active open space within walking distance of most of the people living within a community. Locating an active open space centrally will also ensure the continued presence of people in the vicinity of such a facility, which would protect such space from vandalism.

e. Urban form and function

In order to enhance the focal function of active open spaces, it is imperative that attention is given to the design of these active open spaces. For example, the planting of trees along the periphery of an active open space will enhance the identity and attractiveness of this space. If active open spaces are integrated through design with surrounding
facilities, it will enhance the usage of these spaces. For example, placing an active open space next to or close to a primary school will allow the space to supplement school sport facilities.

5.4.4.2. Active Open Space Hierarchy

The limited funds available for the construction of active open spaces necessitate a critical appraisal of the generally accepted standards and norms applicable to active open space development. An approach based on practical considerations rather than on accepted norms should be followed. One of the most practical ways of utilizing open spaces is to use these spaces as sport or recreation facilities. This connects a deliberate use to open spaces, ensuring they serve a specific community need.

<table>
<thead>
<tr>
<th>Nodal Hierarchy</th>
<th>Service Area Radius</th>
<th>Size</th>
<th>Proposed composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal recreational node</td>
<td>8km</td>
<td>20ha</td>
<td>1 rugby or soccer and athletic stadium&lt;br&gt;3 practice rugby or soccer fields&lt;br&gt;1 cricket oval&lt;br&gt;6 tennis courts&lt;br&gt;2 netball courts&lt;br&gt;Swimming pool&lt;br&gt;Multi-purpose indoor sport centre</td>
</tr>
<tr>
<td>Regional recreational node</td>
<td>4km</td>
<td>15ha</td>
<td>1 rugby or soccer field and athletic track&lt;br&gt;2 practice rugby or soccer fields&lt;br&gt;4 tennis courts</td>
</tr>
<tr>
<td>District recreational node</td>
<td>2km</td>
<td>10ha</td>
<td>1 rugby or soccer field and athletic track&lt;br&gt;2 tennis courts&lt;br&gt;Children’s playground</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2012

Taking into account the above, a 3-tier recreational node hierarchy is proposed for Emfuleni. The composition of these recreational nodes should serve as a guideline for the design and development of active open spaces within Emfuleni, but can
differ depending on the recreational preferences of local communities. The proposed recreational node hierarchy and its composition are depicted in the Table above.

a. Municipal recreational node

A municipal recreational node should provide recreation facilities that are significant on a municipal level, usually with a stadium comprising the central facility within such a node. In addition to the stadium, such a node should contain other highest-order recreations facilities, such as practice rugby or soccer fields, a cricket oval, tennis courts, a swimming pool and a multi-purpose indoor sports centre. Such an active open space must also include a parking area and must be accessible to and from a large bus and minibus taxi terminus. A municipal recreational facility can be the base of citywide sports club.

b. Regional recreational node

A regional recreational node should provide regional sport facilities, typically a number of rugby or soccer fields. The rugby or soccer fields can double as a cricket oval. Such a recreational facility can serve as the base for regional sports clubs.

c. District recreational node

A district recreational node will serve local neighbourhoods and should therefore comprise local recreational facilities, such as a rugby or soccer field and a few tennis courts. These recreational facilities can supplement the recreation facilities of schools and should therefore be located in close proximity of school clusters.

5.4.4.3. ACTIVE OPEN SPACE DEVELOPMENT

Emfuleni has as number of open space, as mentioned in the status quo section (Section 2) of this report. In addition, the Land Use Budget (Section 3) calculated the recreational space required within Emfuleni to support the envisaged population increase. This additional recreation space need should be accommodated within primary, regional and district recreational nodes, as set out in the Table above.
The regional recreation nodes must occupy central locations within Emfuleni area, which will allow these nodes to be accessible from various residential areas. Where possible, these regional recreational nodes must be located within or next to the open space corridors identified within this report. This will allow synergies between these active (recreational) open spaces and the passive open space corridors proposed for Emfuleni.

Apart from the abovementioned regional recreation node, a number of district recreation nodes have been proposed for Emfuleni. Specific locations for these nodes are not proposed. Instead, the locations of these nodes are left to the township establishment process, whereby such nodes can be included into the layouts drafted for proposed residential areas. The rule of thumb in this case is to (a) place these district recreational nodes in accessible locations and (b) place these nodes next to or within the open space corridor, if feasible.

As with community facilities, urban expansion into small holding areas poses the danger that township establishment on these small holdings do not yield the necessary household thresholds to require developers to provide recreational facilities as part of their developments. Should this be the case, it is proposed that Emfuleni pro-actively identifies properties within small holding areas that are suitable for the location of recreational nodes. Emfuleni will then need to purchase these properties and develop recreational facilities on them when urban expansion within these small holding areas necessitates the development of such facilities.

5.4.5. SEBOKENG CBD DESIGN

In contrast to the Vanderbijlpark CBD and the Vereeniging CBD, the Sebokeng CBD is an emerging CBD. The development of the Sebokeng CBD thus needs to be guided by more detailed precinct design. From the onset it has to be stated that the following precinct design aims to provide a vision for the development of the Sebokeng CBD by applying the various development and design principles set out in this document. It is therefore attempted to illustrate how these principles can be employed within the Sebokeng CBD, rather than proposing a rigid spatial structure that has to be adhered to when developing the Sebokeng CBD. The hope is that this design will influence the manner in which the Sebokeng CBD is ultimately developed.
5.4.5.1. Approach and Precinct Attributes

The Sebokeng CBD is an existing and emerging nodal precinct that is located at the existing Houtheuwel commuter railway station. This precinct is thus highly accessible, not only by means of commuter railway network, but will by bus and minibus taxi, as it is located on Moshoeshoe Road, which links it to the Vanderbijlpark CBD in the south and to the Golden Highway in the north.

The basic approach for the development of the Sebokeng CBD is to concentrate higher-density, mixed-use development around the existing Houtheuwel commuter railway station. On the one hand, the purpose of this higher-density, mixed-use node is to boost the number of commuter using this commuter railway stations, thus increasing the viability of this public transportation facility. On the other hand, close proximity to public transit is needed to enable the households living in this higher-density node to access to employment opportunities and social amenities within the greater Emfuleni region.

Currently, the Sebokeng CBD contains a small regional mall, a small industrial area and a hostel complex, a regional hospital and a teachers training facility. Despite the fact that it contain these existing anchor facilities, the node remain poorly integrated and poorly designed on a pedestrian level, in particular relating to the pedestrian links between the CBD and the neighbouring Houtheuwel commuter railway station. This provides the opportunity to illustrate how the application of certain urban design principles can help improve the land use and pedestrian environment of the Sebokeng CBD.

5.4.5.2. Design Principles

Developing or redeveloping a nodal area, such as the Sebokeng CBD, requires applying a number of urban design principles. These design principles need to address a wide range of issues. For example, it is important to know how the specific design of walkways, public spaces and parks can encourage a rich public life within these nodal areas. It is also important to know how buildings can reinforce key locations within nodal areas. Another key element of nodal development is obtaining a public transportation-oriented spatial structure by focusing on pedestrian movement, rather than on private vehicles. Based on the above, the following urban design principles need to be taken into account when developing or redeveloping a nodal area:
PEDESTRIANS

Principle 1: Include public spaces and parks

Public spaces and parks are the heart of cities and nodal areas in particular, because they are the center of economic, civic, and cultural life and human interaction. Creating public spaces or parks within nodal areas that foster community and civic engagement not only involves the design of these spaces, but also its sensible location of these spaces and the appropriated design of the built fabric around these spaces. A public space and parks can function as a market place, a ceremonial civic stage, a playground for children, and a sport facility.

Principle 2: Create a hierarchy and network of public spaces

The public realm should not apply to only one geographic level, but should rather be developed on a number of geographical levels in order to be most effective. This can be done utilizing a hierarchy of public spaces that can range from a number of public buildings cluster around an public space to a single recreation facility located within the flood plain of a river that flows though a node. What is import is that these public spaces are interconnected to create a network of public spaces within a nodal area. Such a network of public spaces requires an open and accessible township layout, which is best served by a grid road network. It is often useful to orient nodal development around a central pedestrian space, such as a plaza or park. It is also beneficial if nodes include some kind of larger public event space, such as a square on amphitheatre. Such spaces help foster community interaction and can be used for a variety of events with regional drawing power, such as markets and festivals.

Principle 3: Develop a pedestrian network

Public buildings, public spaces and public transit stations must be linked by a continuous network of pedestrian walkways and traffic tamed streets. The goal must be to make the public transit stations accessible by foot, especially for children and the elderly. Pedestrian network design should incorporate sidewalks, seating, lighting and signage. Accommodate pedestrians in a safe manner by separating pedestrian and vehicular movement. Where vehicles cross the pedestrian network within nodal areas, it is the pedestrian who must be given priority using raised crossings at sidewalk height.
Principle 4: Allow pedestrian permeability in nodal areas

A basic requirement for the efficient operation of the public transit system is pedestrian access, because it is pedestrians and not private vehicle owners that use public transportation. It is therefore important that nodal areas are designed in such a way that is would encourage direct pedestrian movement to public transit stations. This is called pedestrian permeability and is best achieved using a grid street pattern (see Diagram above). Pedestrian permeability includes establishing smaller urban block sizes that enables access to public transport facilities, avoiding gated developments which do not provide public access, avoiding long cul-de-sacs with no pedestrian through-linkages, and providing through-site links for pedestrians on larger sites where streets are not practical.

Principle 5: Create pedestrian friendly spaces

Pedestrian life is an integral component of successful nodes and investing in such spaces can help attract pedestrians and increase the viability of local businesses within nodal areas. Comfortable sidewalks, gathering places, tree-lined
streets, public art, and street fronting retail are all components of pedestrian friendly spaces. All high pedestrian traffic area, such as pedestrian walkways and urban squares, should be adequately paved. Pedestrian ways, entrances, parking area, and public open space should be adequately lit to ensure night-time security. Building design within the node should also be pedestrian-oriented by incorporating seating, rain protection and other pedestrian features.

**Principle 6: Safety and Security**

Public space should be designed as a positive space and integrated with the nodal development by way of landscaping, pedestrian access paths and lighting. Maximise public surveillance public spaces whilst also protecting the privacy of properties. Public surveillance can be increased by maximizing the number of windows and balconies facing onto streets and public spaces. Concealing walls should be avoided along pedestrian routes. Provide lighting and good visibility of entrances, public spaces and pedestrian walkways and provide safe access between parking areas and access to buildings.

**TRANSPORT**

**Principle 7: Multi-modal access**

To reduce private vehicle dependency and provide greater transportation choice to residents, visitors, workers and shoppers, successful nodal developments must include a range of public transportation options. Nodal development must therefore not be designed solely for access by the private vehicle, but should accommodate public transport and pedestrian on its streets in a safe and efficient manner. Transit stops must be conveniently placed and pedestrians must be provided with wide sidewalks and safe pedestrian crossings to access public transportation.

**Principle 8: Design around public transport**

Value is added to the public realm of a nodal area if provision is made for public transport, because the success of nodal areas is largely depended upon these nodes being tied into the existing and planned commuter rail network. Land use density, land use mixed-use and the location of public transit stations within the public realm go hand-in-hand and should be planned as such. Providing pedestrian connections are also essential in this regard. When designing for public transit in nodal areas where good public transit does not yet exist, it is important to provide locations for future bus shelters and minibus taxi ranks to make transit service upgrades easier.
Principle 9: Integrate land use and transportation

Integrate the existing commuter railway stations with the existing and proposed land uses within each nodal area. To enable this, it will be necessary to link these transit facilities with the surrounding land uses through a network of pedestrian walkways. The existing internal road network can be used for this. Different types of paving can be used to separate vehicular and pedestrian movement, making nodal areas pedestrian-safe areas. In addition, these pedestrian walkways need to be extensively landscaped to ensure they attract pedestrian movement.

Principle 10: Create traffic calmed streets

Central to creating a pedestrian and public transit environment within nodal area is the curbing of the excessive use of private vehicle usage within nodal areas. Techniques to reduce the volume and speed of vehicular traffic within nodal areas include traffic calmed streets, where pedestrians are given equal rights to vehicles within a street. Many techniques to calm vehicular traffic on local street exist, giving priority to pedestrian and public transportation, such as roundabouts and raised pedestrian crossing.

Principle 11: Parking layout

Providing parking within a nodal area is an essential part of nodal development. However, the way such parking areas or structures are designed and incorporated into a nodal area can make a big difference to the way that nodal areas are designed and used. Appropriate parking design ensures that parking structures are visually compatible with the character of the nodal development, minimizes the amount of street frontage given over to parking areas or structures. Ways to achieve this is to break up large parking areas with trees, buildings, or different surface treatments, or to provide parking areas underground or in semi-basements where practical.

LAND USE

Principle 12: Provide wide range of land uses

It is important that a land use mix be obtained within each nodal area to ensure a sustainability and vibrant nodal environment. Nodal areas should thus be designed to include a range of mutually supportive uses, including retail, service, offices and residential uses, developed in an integrated manner. This land use mix must be developed around pedestrian accessibility and access to public transit.
Principle 13: Use retail to activate pedestrian movement

Critical to achieving a land use mix within a nodal area is the development of the strong retail component as part of the land use mix of a nodal area. Retail uses at ground level can help activate pedestrian areas, especially in blighted or neglected parts of nodal areas. These retail land uses should be placed in such a manner that it acts as pedestrian anchors, drawing pedestrians throughout the entire nodal area.

Principle 14: Cluster community facilities

Community facilities need to be clustered within node areas, rather than dispersed individually throughout a node. This will stimulate the viability of these facilities, create strong focal points within the node and create a more ordered nodal structure. The type of community facilities provided within each node must take into account the intended function of the node and the population it intends to serves. In other words, a higher-order node must contain higher-order community facilities and a lower-order node must contain lower-order community facilities.

Principle 15: Develop a range of housing typologies

This spatial arrangement of different housing typologies within a nodal area can be applied in such a manner that is contributes to urban form and legibility of the nodal area. For example, higher-density housing can be used to signifying the central parts of a nodal area or the location of a public transportation station. Walk-ups are most suited for nodal areas and best support public transportation facilities. Providing a range of housing typologies within nodal areas can be used to create variety and complexity to the nodal area and, at the same time, cater for the needs of a range of household structures. Successful nodes are dynamic spatial entities that able to accommodate a diversity of residents at varying stages of life (children to aged).

BUILT ENVIRONMENT

Principle 16: Create compact and varied urban fabric

A sustainable and vibrant nodal area contains an urban fabric that is compact, of a pedestrian scale, and has a varied urban fabric, which is achieved through the development of an appropriate land use mix. Such an urban fabric supports pedestrians and promotes walking as a primary means of movement, because its urban fabric contains a diversity of shopping, housing, and social facilities located within walking distance of each other.
Principle 17: Create urban character

Urban character within nodal areas can be created in a number of ways, using building design. Urban character can be obtained by establishing visual connections to landmarks and public facilities within nodal areas, using built form and height to signal gateways into nodal areas, acknowledge the scale and character of existing buildings within the nodal areas, avoid high fences or walls in front of buildings along main streets or pedestrian walkways, encouraging new buildings to front onto public spaces where such space exist, using similar building typologies on both sides of a street to enable a consistent streetscape, and retaining and incorporating historically significant buildings into the development of a nodal area.

Principle 18: Vary building design

There always exists the danger when developing nodal areas that sterile environments are created with no variations in building design, height and orientation. Varying design, height and orientation within nodal areas creates an interesting and aesthetically pleasing nodal environment. Incorporating existing buildings into a planned development helps create a more varied environment and links a node to its historic context. For example, existing farm buildings can be converted into community or recreation facilities.

Principle 19: Create density interface

Step-downs densities must be used to make higher-density nodal areas compatible with neighbouring lower-density residential areas or adjacent natural areas. In addition, a good interface requires architectural compatibility between the building of nodal areas and the buildings of neighbouring residential areas. This requires the appropriate location of entrances, windows and balconies of buildings located within nodal areas, which overlook public spaces, but do not provide direct views through the windows of neighbouring buildings. Site obscuring landscaping may be required to provide visual buffering between nodal areas and neighbouring residential areas.

Principle 20: Well-designed buildings

Good building design not only helps to achieve higher densities within nodal areas, but it also helps to create a livable and vibrant nodal environment, which is a prerequisite for attracting both people and businesses to nodal areas. Building design should be location-specific; in other words, it should aim to create a unique identity for a specific node. Such an identity should be determined in consultation with property owners, businesses, and local residents. Building design must
take into account simple design features, such as having storefronts that face the street and overhangs that allow sidewalk activity.

Principle 21: Massing, height and scale

Massing, height and scale are important elements which can effectively be used to create a sense of place and character within a nodal area. To enable the latter, the height and massing of each building within the nodal area must acknowledge and respond to adjacent buildings and public spaces within the nodal area. For example, the height of buildings must respond to the existing context and character of a nodal area. Also, building height and massing should be manipulated to minimise overshadowing of public spaces and pedestrian walkways. Massing and height of buildings should not diminish the human scale at the street level.

Principle 22: Frontages, facades and entrances

Frontages, facades and entrances are important elements which determine the impact (negative or positive) that a building has on the nodal environment. Basic guidelines to be followed include encouraging building facades to respond to street corners and public spaces, allowing building entrances to face streets or street corners, avoid creating inactive street frontages, and clearly articulating entrances with architectural features. Existing buildings of high architectural quality and visual interest (if available) can be used as benchmark developments within nodal areas. Also, contextual cues associated with existing streetscapes can be included into new buildings frontages in terms of roof form, wall treatment, and choice of material.

AESTHETICS

Principle 23: Apply appropriate architecture

In nodal areas, buildings are not freestanding objects in space, but are connected to each other forming blocks of buildings that enclose streets, public spaces and parks. Buildings within such a context must respect neighbouring buildings in its design and create an architectural dialogue that accentuates the public realm. This involves buildings that are linked, open and oriented towards each other, rather than building which are closed off to one another.

Principle 24: Incorporate esthetics and urban art
An aesthetically pleasing nodal environment is one that applies good design and aesthetics on an overarching level, as well as a detailed level. On an overarching level, nodal areas must have clear boundaries, centers and focal points. On a detailed level, meaningful and accessible public art can play a role in humanizing the nodal environment and express the identity of the nodal area by representing traditional industry and crafts, marking historic connections, and portraying local myths and legends.

Principle 25: Greening and landscapes

Nodal developments must integrate, protect and enhance natural features that traverse the nodal area. Existing trees and notable landforms, such as large boulders, should be maintained and incorporated in the overall design. Such features give a nodal area a unique character and help create a sense of place. Naturalized storm water management should be encouraged to create multi-purpose open spaces. Plant trees along the pedestrian walkways leading to these urban spaces and open spaces in order to strengthen visual linkages and accentuate pedestrian connections.

5.4.5.3. Design Principles Applied

Pedestrian movement and connectivity is central to the design and development of a nodal area that supports public transportation. The reason for this is simply that pedestrian embark and disembarks trains, buses and minibus taxis and walk to access nodal land uses. This interrelationship between land use development and access to public transportation is enforced by the public realm. Figures 28 to 30 illustrate how the development principles set out above, relating to the land use, public realm and transportation can be applied to the development of the Sebokeng CBD.

The Sebokeng CBD is located at the existing Houtheuwel commuter railway station. The existing Sebokeng Mall and the Sebokeng Hospital are the primary land uses defining this CBD. The urban design framework proposes that this existing land use component be strengthened through infill development and the densification of the Sebokeng CBD. Primarily, this can be done through the development of walk-ups on vacant land within the CBD (see before and after images). These walk-ups will provide the CBD with a greater land use mix, which would benefit the vibrancy of the CBD area and better support the public transportation facilities within the CBD.
FIGURE 29
SEBOKENG CBD STRUCTURE
These walk-ups could also potentially provide enough units to accommodate the existing Sebokeng hostel residents (as well as a number of additional households), which could assist in the redevelopment of the hostels site. In addition to the above, the urban design framework proposed the infill and densification of the existing light industrial area, located north of the Sebokeng Mall. This redevelopment can comprise hive-industries, which can be rented out to the local population to support SMME development. The massing and height of the walk-ups and light industrial buildings can effectively be used to create urban form and character within the Sebokeng CBD.

Public space and pedestrian walkways can be used to increase the legibility of the node and provide suitable pedestrian environments. In particular, the urban design framework proposes the establishment of a diagonal pedestrian walkway crossing between the Sebokeng Mall and the Houtheuwel commuter railway station, as well as between the Sebokeng Hospital and the Houtheuwel commuter railway station. This will enable a direct link between the major land uses within the CBD and the Houtheuwel commuter railway station. The proposed walk-ups abutting pedestrian walkways leading to the Houtheuwel commuter railway station can contain a mixed-use component at ground-floor level, to accommodate shops and restaurants. This allows the mix-use component to benefit from the pedestrian traffic passing through these developments and it will help create a more vibrant nodal environment.

Creating a ‘sense-of-place’ within the Sebokeng CBD is important, because Sebokeng has historically been developed as a peripheral area with no particular identity and urbanity. This needs to be changed and can largely be achieved through the proper design of its CBD area. Generally, a ‘sense-of-place’ is defined by elements such as land use mix, spatial layout, building size and orientation, landscaping, and the manner in which pedestrian and pedestrian movement is accommodated; which are all elements mentioned above.

5.5. HOUSING DEVELOPMENT

Housing is a strong form-giving element that can impact substantially of the development of an urban area. For example, housing can be used as an infill land use, which could enable the integration of a fragmented urban area. Also, housing can provide the necessary land use densities to support public transport and retail centre development.
Housing types can be categorised according to level of attachment. Level of attachment refers to the vertical and horizontal attachment of buildings. There is a tendency, when addressing the housing demand, especially for the affordable housing sector of the population, to provide freestanding units with little or no level of attachment. There is little exploration of the benefits of other housing typologies, such as flats, walk-ups, row housing, and semi-detached units.

The following discussion on typologies is not exhaustive, but rather focuses on housing and density types that are appropriate for Emfuleni. The Table below provides an easy-reference summary of the attributes of the different housing typologies and how it compares with the attributes of other housing typologies.

a. Detached housing

Detached units are standalone structures situated on a single, individually registered stand. This is the most commonly used housing type within Emfuleni and is used for bonded and well as affordable housing. As a bonded housing typology, detached housing is often used in estate development, with added security fencing and communal facilities to achieve some of the advantages that are usually associated with cluster housing developments. As an affordable housing unit, the design of this housing typology is usually limited to the requirements of the government housing subsidy scheme.

As is evident from the above, the densities of this housing type vary dramatically, depending on its use. As bonded housing, this housing typology is usually located on stands generally 1000m² in size and achieve an average nett density of 10u/ha. As an affordable housing option, this housing typology is usually located on stands of approximately 250m² and achieve nett densities of approximately 40u/ha. Such densities (both bonded and to a lesser extent affordable) do not promote the efficient use of land and do not promote the viable operation of public transportation systems. Consequently, this housing type should not be promoted in close proximity of public transportation routes, but should rather be used in peripheral areas of developments.

In terms of infrastructure costs, this housing typology is the most expensive housing option. The low densities and large stand sizes of this housing type result in large street frontages, which result in long infrastructure runs. This housing type is the least complicated to construct, resulting in relatively low construction costs, when compared to other housing typologies.
## TABLE 32: BONDED AND AFFORDABLE HOUSING TYPOLOGIES

<table>
<thead>
<tr>
<th>Housing Typology</th>
<th>Gross Density</th>
<th>Net Density</th>
<th>Stand Size</th>
<th>Building Height</th>
<th>Tenure Options</th>
<th>Subsidy Options</th>
<th>Plot layout</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bonded Housing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detached housing</td>
<td>5 u/ha</td>
<td>10 u/ha</td>
<td>1000 m²</td>
<td>2 storey</td>
<td>Full title</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Cluster housing</td>
<td>12 u/ha</td>
<td>25 u/ha</td>
<td>400 m²</td>
<td>2 storey</td>
<td>Full title or sectional title</td>
<td>n/a</td>
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<tr>
<td>Flats</td>
<td>80 u/ha</td>
<td>120 u/ha</td>
<td>n/a</td>
<td>6 storey</td>
<td>Rental or sectional title</td>
<td>Institutional subsidy</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Affordable Housing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detached housing</td>
<td>20 u/ha</td>
<td>40 u/ha</td>
<td>250 m²</td>
<td>1 storey</td>
<td>Full title</td>
<td>Project-linked subsidy</td>
<td></td>
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<tr>
<td>Semi-detached</td>
<td>25 u/ha</td>
<td>50 u/ha</td>
<td>200 m²</td>
<td>2 storey</td>
<td>Full title</td>
<td>Project-linked subsidy</td>
<td></td>
</tr>
<tr>
<td>Row housing</td>
<td>30 u/ha</td>
<td>60 u/ha</td>
<td>160 m²</td>
<td>2 storey</td>
<td>Full title</td>
<td>Project-linked subsidy</td>
<td></td>
</tr>
<tr>
<td>Walk-ups</td>
<td>40 u/ha</td>
<td>80 u/ha</td>
<td>n/a</td>
<td>3 storey</td>
<td>Rental or sectional title</td>
<td>Institutional subsidy</td>
<td></td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2012
b. Cluster Housing

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

Cluster houses are usually located on stands of smaller size than those used for detached housing. These smaller stand sizes are often achieved through the use of shared walls. Stand sizes typically range from 400m² and yield a nett density of approximately 25u/ha. The smaller stand sizes translate to substantial infrastructure cost savings, making cluster housing more cost-effective than detached housing units. Shared walls also reduce the construction costs of the buildings, compared to detached housing units.

The smaller stands and higher densities achieved by this housing typology, compared to that of detached housing units, make it more suitable as a public transport related development. Although it does not create the desired densities that would significantly boost public transport patronage, it is a better option than detached units. In a sense, this housing typology creates a balance between creating detached or semi-detached housing units and achieving higher densities that are more transport related. This housing typology is preferably located along public transport routes, but not next to public transportation termini, which would require higher-density housing options.

c. Semi-Detached Housing

Semi-detached housing is a suitable affordable housing option and involves 2 housing units attached to one another, thus sharing at least one wall of the unit. This housing type does not exclude a second storey. Ground access, a private garden and on-site parking is possible with the housing typology.

Semi-detached houses are usually located on individually registered stands of smaller size than those used for single detached housing. These smaller stand sizes are achieved through the use of shared walls. Stand sizes are typically 200m² and yield a nett density of approximately 50u/ha. The smaller stand sizes translate to substantial infrastructure cost savings, making semi-detached housing more cost-effective than detached housing units. Shared walls also reduce the construction costs of the buildings, compared to detached housing units.
The smaller stands and higher densities achieved by this housing typology, compared to that of single detached housing units, make it more suitable as a public transport related development. Although it does not create the desired densities that would significantly boost public transport patronage, it is a better option than detached units. In a sense, this housing typology creates a balance between creating affordable housing units (within the subsidy range) and achieving higher densities that are more transport related.

d. Row Housing

Row housing is largely an affordable housing option and comprises more than 2 housing units linked to one another, as opposed to semi-detached housing with involves linking only 2 housing units to one another. The housing units that can be attached are not limited to a specific number, but 4 attached units create a well-scaled building. Usually, row housing comprises 2-storey units and this, combined with shared walls, reduces the construction costs of these units. This configuration allows small stand sizes in the order of 160m² and this makes substantial infrastructure cost savings possible. Row houses have ground access and each unit has a private garden. On-site parking is possible. Row housing can either be full title (individually registered stands) or sectional/communal title. The small stand sizes of row housing yield a nett density of approximately 60u/ha. This density is basically the entry-level density to ensure the optimal operation of public transportation systems. By developing such housing types within walking distance of public transport termini, would better serve public transport than lower density housing and better ensure the viability of these public transport systems, specifically commuter rail.

e. Walk-ups

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

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

This housing typology does is cheaper to built than flats, because it does not require costly lifts or costly construction methods to construct high buildings. In addition, the higher densities obtained through walk-ups compared to detached and semi-detached housing units, makes substantial savings in infrastructure costs possible. This cost saving not only applies to municipal infrastructure (water, sanitation and electricity), but also to the provision of roads. Despite this cost-saving, walk-up units cost substantially more than conventional affordable housing typologies and are therefore not possible to provide within the government housing subsidy limit. Provisions are higher-density housing options within the Restructuring Grant of the Housing Subsidy.

f. Flats

Flats are the highest density housing typology and are most suited as rental housing. As with walk-ups, this housing typology comprises housing units stacked on top of each other. The difference between flats and walk-ups is the height of the buildings, with flats exceeding 3-storeys and walk-ups not. Consequently, flats have to be served by a lift, whereas walk-up only need be served by a staircase. The configuration of a block of flats excludes full title ownership as a tenure option, leaving sectional title and rental as the only tenure options. The gardens of the building are communal and on-site parking is provided using parking lots and garages.

An advantage of flats is the infrastructure cost savings that is made possible by its high occupation densities. These cost savings are partly negated by the costs involved in the construction of this more structurally complicated building, as was discussed under ‘walk-ups’ above.

The primary advantage of flats relates to the use and operation of public transportation systems. Because flats achieve nett densities of 120u/ha within close proximity of public transportation stations, it can significant increase the number of commuters living within walking distance of a public transport system, thus boosting patronage of the transportation system. Taking into account that the household that use public transportation are also the household that typically occupy flats, creates an efficient relationship between this housing typology and public transport.
5.5.2. HOUSING DENSITY

One of the critical factors in developing our cities into sustainable urban environments is the development of new residential areas at higher densities than in the past. In this regards, the higher densities are important for several reasons:

- Higher densities lead to a significant saving in land cost per unit, as less land is needed and land is used more efficiently.
- One of the main arguments for encouraging higher densities is the efficient provision of infrastructure. Low density means long infrastructure runs and therefore higher cost per consumer both for installation and for operation.
- Efficient public transport requires medium to high densities to be able to provide frequent and efficient services. Low densities with long walking distances for the poor cannot support good public transport.
- Community facilities, such as schools and health clinics, are difficult to reach for many people at low densities.
- Density is significant for the economic performance of a city. High population density means a high level of access to employment opportunities and to markets.

5.5.2.1. UNDERSTANDING DENSITY

Density is a controversial topic and is often misunderstood, as it is linked to misplaced values. Perception of density is also linked to cultural background. There are some misconceptions on densities that influence the perception of what appropriate densities are because there is a vast difference between perceived and measured densities. The misconceptions regarding densities are:

- Firstly, it is often taken that low densities create high quality environments and high densities create low quality environments. However, high quality environments can be created at both low and high densities and depend more on design considerations than density. Instead, poor living conditions are more a cause of other factors, such as bad architectural design, a lack of infrastructure and public services, scarcity of open space, poor environmental conditions and poverty.
- Secondly, there is a misconception that only one housing type can be created at a certain density. In fact, a wide variety of housing types can be provided at most densities, except at the lowest end of the scale. For example, similar densities can be achieved by four storey buildings as can be achieved by high rise tower blocks. Thus, a high-density environment does not necessarily mean a high rise environment.
Thirdly, the misconception exists that high densities are appropriate for low-income groups and low densities are only appropriate for high-income groups, because of the cost implications. Internationally, numerous examples exist where varying densities have been applied successfully to all income groups.

5.5.2.2. Densities Applied

It is imperative that at least part of the future residential need within Emfuleni be addressed using higher density housing typologies. Not only this, these higher density housing developments need to be linked to existing or planned public transportation infrastructure in order to support the viable operation of these public transportation systems. In this regard, it is essential to encourage the necessary residential densities that are required to support the Vereeniging-Johannesburg commuter railway line and stations. Higher-density housing units need to be located within walking distance of commuter railway stations to establish a link between these housing units and the commuter rail system. Higher density housing can also effectively be used to signify nodal areas, using the height of the building within the surrounding lower-density residential areas. Using higher-density housing in relation to nodal development was addressed in the Sebokeng CBD Design presented in a previous section of this report.

In addition to the above, the development of higher-density housing must aim to promote the development of sustainable communities by incorporating the development of the necessary community facilities and open space to support these higher-density housing developments. In other words, this requires an integrated approach to higher-density residential development; whereby community facilities and transportation are develop as part and parcel of high-density residential development.

Due to the current capacity status of engineering services in Emfuleni area, the following density as indicated in Table 33 below is recommended. It should be born in mind that respective density recommendations as indicated in Table 33 below shall take precedence over any density recommendation as reflected in Figure 22 (Spatial Development Framework Map) where there is a perceived or real contradiction. Table 33 and Figure 22 be read in conjunction with Table 27. This is done to ensure that centrifugal patterned hierarchical densification of parcels of land surrounding nodes is achieved to maximize utilization of existing engineering infrastructure; attain sustainable compact cities and provide minimum density thresholds to support public transport systems.
<table>
<thead>
<tr>
<th>Density</th>
<th>Primary Node</th>
<th>Secondary / Regional Node</th>
<th>Community node</th>
<th>Neighbourhood node</th>
<th>Specialised node</th>
<th>Transit Orientated Station (TOD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Density</td>
<td>40 to 60 Units/Ha within a node</td>
<td>40 to 60 Units/Ha within a node</td>
<td>40 to 60 Units/Ha within a node</td>
<td>40 to 60 Units/Ha within a node</td>
<td>40 to 60 Units/Ha within 100m radius from a node</td>
<td></td>
</tr>
<tr>
<td>Medium Density</td>
<td>20 to 40 Units/Ha within 200m radius from a node</td>
<td>20 to 40 Units/Ha within 100m radius from a node</td>
<td>20 to 40 Units/Ha within 50m radius from a node</td>
<td>20 to 40 Units/Ha within 100m radius from a node</td>
<td>20 to 40 Units/Ha within 300m radius from a node</td>
<td></td>
</tr>
<tr>
<td>Low Density</td>
<td>0 to 20 Units/Ha beyond a 200m radius from a node</td>
<td>0 to 20 Units/Ha beyond a 100m radius from a node</td>
<td>0 to 20 Units/Ha beyond a 50m radius from a node</td>
<td>0 to 20 Units/Ha beyond a 100m radius from a node</td>
<td>0 to 20 Units/Ha beyond a 300m radius from a node</td>
<td></td>
</tr>
</tbody>
</table>

### 5.5.3. AFFORDABLE HOUSING DEVELOPMENT

Affordable housing is a critical and central component in further development and expansion of the Emfuleni urban area. If developed correctly, it can contribute to the character and livability of an urban area. However, it should be noted that in order to achieve such affordable housing developments does not have to do with the cost of affordable housing development as much as it has to do with the design of these housing units and the willingness of developers to ‘go the extra mile’ to achieve more livable residential environments.
5.5.3.1. Development Approach

In the past, the Provincial Department of Housing considered that the best way to address the housing backlog was to adopt a strategy that was based on chasing numbers: a mass housing approach. Through this approach, houses were built where land
could be acquired cheaply and this usually perpetuated urban sprawl and unsustainable development. In recent years, realities in the provision of housing have brought about a shift in the housing strategy. Now the challenge is to go beyond the simple provision of houses and build communities and create conditions that promote sustainability. As depicted by the Diagram above, this new approach is expressed as follows:

a. New town development

Although new town development involves a mass housing approach, the way it is structured today differs significantly from how it was structured a decade ago. Today the emphasis is on providing a mix of housing typologies and tenure types. Also, achieving transportation integration and linking these housing developments with employment, shopping and community nodes is considered a priority.

b. Urban infill development

Urban infill development involves developing affordable housing within existing urban areas on well-located land. Such housing developments are typically located within inner cities and decaying suburban CBDs and are often used to breathe new life into the decaying nodal areas. In turn, this places affordable housing in close proximity of the employment opportunities and social amenities found within these nodes. In addition, affordable housing development can be effectively used to increase residential densities along public transportation spines to increase the viability of public transportation systems.

c. Township upgrading

With the launching of the Top 20 Priority Township Programme by the Gauteng Department of Housing, recognition was given to upgrade townships within Gauteng that were constructed before 1994. This included the upgrading of road and municipal infrastructure within these townships, the use of vacant land within the townships for housing and other purposes, and the in-situ upgrading on informal settlements associated with the townships.

5.5.3.2. Affordable Housing Approach Applied
It should be evident from the above that the challenge is to go beyond the simple provision of houses. The challenge is to build communities and create conditions that promote sustainability. Central to sustainability is the issue of location, which involves building houses on well-located land that is close to job opportunities and the necessary social amenities. Consequently, housing projects must adhere to very specific location criteria. This will often necessitate housing developments to be located on well-located and expensive land, rather than on cheap land on the outskirts of cities.

It is also important to point out that no single approach would fully address the affordable housing backlog within Emfuleni. All the three planning approaches (new town development, nodal development and township upgrading) are necessary. For example, the new town approach is necessary because it is the only approach that can address the huge housing backlog within Emfuleni. So too, it is necessary to create more sustainable nodal areas, by adding a higher-density residential component to these nodes.

**TABLE 34: HOUSING DEVELOPMENT APPROACH**

<table>
<thead>
<tr>
<th>Development Approach</th>
<th>Typologies</th>
<th>Possible Development Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>New town</td>
<td>Detached housing</td>
<td>Golden Gardens</td>
</tr>
<tr>
<td></td>
<td>Semi-detached</td>
<td>Johandeo</td>
</tr>
<tr>
<td>Nodal</td>
<td>Semi-detached</td>
<td>Cyferpan</td>
</tr>
<tr>
<td></td>
<td>Row housing</td>
<td>Proposed regional nodes</td>
</tr>
<tr>
<td></td>
<td>Walk-ups</td>
<td></td>
</tr>
<tr>
<td>Infill</td>
<td>Semi-detached</td>
<td>Lethabong</td>
</tr>
<tr>
<td></td>
<td>Row housing</td>
<td>Tsipeso</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At commuter railway stations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Along SPTN routes</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2012

The approach set out above can be applied within Emfuleni in terms of housing typology mix and geographical distribution, as set out in the Table above. First and foremost, the nodal areas proposed within Emfuleni need to be developed with higher-density housing typologies, such as semi-detached housing and walk-up units. These higher-density housing units are needed to support the business components located within these nodes, as well as the public transportation facilities provided within these nodes. The Sebokeng CBD is most likely of only nodal area appropriate for the development of walk-up. Other nodal areas can use alternative higher-density housing options, such as semi-detached and row housing units. Semi-detached and row housing units better suite the Government housing subsidy than do walk-up units, which are generally more expensive than standard
affordable housing units. The Sonlandpark regional node proposed at the proposed Sonlandpark commuter railway station will be suited for the development of semi-detached and row housing units.

Using higher-density residential development can also be effectively used as infill development within Emfuleni. Many vacant or underutilized stands exist within the triangle anchored by the Vanderbijlpark CBD, the Vereeniging CBD and the Sebokeng CBD, which can be used for infill housing. In particular, vacant or underutilized stands located next to or near the proposed SPTN routes traversing the above mentioned triangle can be utilized for the development of higher-density semi-detached and row housing units. The remainder of Emfuleni that is earmarked for residential expansion up to the year 2020 and can be developed with more conventional affordable housing units. However, it is recommended that township layout design and building design be innovatively used to create livable residential environments within these affordable housing developments. The following general aspects need to form the basis of the design and the development of affordable housing within Emfuleni:

a. Create a housing typology mix

Create a housing typology mix that will cater for a wide range of households and income groups. Applying a housing typology mix will also enable a better interface between an affordable housing development and neighbouring land uses.

b. Creating a housing tenure mix

Creating a housing tenure mix that will cater for a wide range of households and income groups. One will most probably find the many households living in and around Emfuleni, who requires affordable housing, are not South African citizens. Such households are not eligible for a housing subsidy and are therefore reliant on rental housing for accommodation. Rental housing can be applied in many different ways, such as providing a second dwelling for rent on a property developed under the housing subsidy scheme.

c. Link higher-density housing to public transportation

Link the affordable housing developments to the public transportation network serving Emfuleni. This involves developing higher-density housing along SPTN routes and at commuter railway stations. Semi-detached housing units can effectively be used for this purpose, because the cost of developing such units is very similar to the costs of developing more convention affordable housing units.
5.6. TOURISM

The natural environment and tourism go hand-in-hand. Without beautiful, protected and well-managed natural environment, the tourism potential on any region will be severely diminished. Based on this point of departure, tourism development must adhere to two central principles: quality and accessibility. Quality refers to aspects such as environmental management, availability of municipal services infrastructure, land use management and architectural standards. Accessibility refers to the availability of and quality of transportation infrastructure, such as roads and railway lines, as well as the availability of public transport services. Attempts are made in this section to address these principles and proposed ways in which tourism development can be encouraged within Emfuleni.

5.6.1. RIVER CITY CONCEPT

The Emfuleni Local Municipality views Emfuleni to be a River City. This central idea stems from the fact that Emfuleni is situated on the banks of the Vaal river; the largest river flowing through Gauteng. Based on this central idea, Emfuleni aims to create a better connection between the city and its river environment. Up to now, much of the city has been developed without much regard for this connection; thus not fully utilizing the potential of the river. Although the basic structure of the city has already been established, for example the location of the central business districts, there are conceptual ideas that can be implemented, which would improve the connection between the city and the Vaal River. These conceptual ideas are depicted by the overarching conceptual diagram below, which basically comprises the following elements:

- RIVER CORRIDOR: The Vaal River should be seen as a corridor, rather than a boundary located on the edge of the city. Viewing the river as a corridor will help focus prime development of the river front and avoid locating peripheral uses, such as industrial areas, next to the river.
- NODAL DEVELOPMENT: In order to structure development along the river, it will be necessary the focus development at key areas along the river in nodal form. This will provide distinct destinations along the river, which will help draw tourists and day-visitor to the river.
EMFULeni SPATIAL DEVELOPMENT FRAMEWORK

DIAGRAM 25: RIVER CITY CONCEPT
Position Vaal River as the focal area of Emfuleni
Enhance river environment
Link open space lattice to Vaal River
Provide access to Vaal riverfront

DIAGRAM 26: RIVER CITY PERSPECTIVE
• CONNECTION: To prevent the Vaal River from becoming an exclusive resource for only those living next to the river, it will be necessary to establish linkages between the river and inland locations where possible. This will make the river more accessible to the larger Emfuleni population.

The establishment of the River City concept set out above needs to be done through the implementation of a number of principles. The following principles can be identified for the establishment of the River City concept:

[Diagram of River City concept]

CONNECTION: Urban areas located inland need to be connected to the Vaal River via the river system flowing into the Vaal River. This connection needs to be established on two levels. The first level involves an ecological linkage, whereby the river system function as an uninterrupted open space lattice linking urban areas to the Vaal River. The second level involves linking these urban areas to the Vaal River using pedestrian walkways and pedestrian bridges where necessary.

[Diagram showing ecological linkage and pedestrian connections]
ACCESS: The public requires access to the Vaal River waterfront (at lease at certain points) to prevent the river from becoming the exclusive property of the landowners that have properties that border the river. There are two (2) ways of providing the public access to the riverfront. The first is paid access provided by land owners, such as the Emerald Casino. The second is access to parks that abut the river, which is in municipal ownership. Both access types need to be employed.

NODAL DEVELOPMENT: The development of a clear nodal structure along the Vaal River will increase spatial legibility along the river. In turn, this will enhance the idea of Emfuleni being a river city. Nodal developments can consist of a variety of typologies. For example, a nodal development can be a settlement located next to the river, it can be recreation area situated on the riverfront, or it can be a business node with restaurant and other tourist attractions situated at the waterfront.
VARIETY OF USE: It is important that a variety of uses be encouraged along the Vaal River. This will ensure that the river cater for the needs of all the inhabitants of Emfuleni. Uses can range from using the river a water sports (such as boating and fishing), to using the river for more passive uses, such as braaing or bird watching. Establishing the needs of neighbouring communities can go a long way in determining the functions that the river will need to fulfill.

REDEVELOPMENT: Up to now, much of the city has been developed without much regard for the connection between the city and the river. This has often led to the development of land uses, which are unsuited for a riverfront, such as industrial uses. To fully utilize the potential of the river, these properties can be redeveloped into uses that are more suited for a riverfront, such as tourism related land uses.

ENVIRONMENTAL ENHANCEMENT: The Vaal river environment will need to be protected and enhanced where environmental degradation has taken place, if Emfuleni is to be branded a river city. This will require steps such a
removing and curbing alien plant species invasion, the rehabilitation of degraded water courses and wetlands, and the planting of indigenous vegetation to enhance nodal and recreation areas along the river. Emfuleni Local Municipality will produce a local spatial development framework to provide a comprehensive detailed elaboration on the River City concept and recommend concrete steps calculated at crystalizing the achievement of a river city.

5.6.2. TOURISM DEVELOPMENT

Nationally there is a strong tendency towards nature-linked tourism and nature-linked tourist destinations within South Africa. As a result, areas with natural beauty are popular tourist attractions. Emfuleni has the scenic Vaal River and this provides Emfuleni with tourism potential, especially with regard to local tourists and day-tourist originating from other parts in Gauteng. This tourism potential is centred on the following tourist areas:

a. Emerald Casino

The Emerald Casino was established with the aim of promoting tourism development within Emfuleni. It has only been able to do so to a certain extent. To enhance the role of this facility, it is proposed that the casino product be re-evaluated to determine how to better utilize this tourist resource. For example, the better utilization of its riverfront can be explored. The Emerald Casino is the only casino within Gauteng with a natural waterfront.

b. Lochvaal Barrage

Lochvaal Barrage is the tourist area that is most under development pressure. This development pressure involves the converting of agricultural holdings along the Vaal River into high-density residential development. These higher-density residential developments are mostly intended for weekend tourists from other parts in Gauteng. This development pressure requires strict land use control be exerted within this area to ensure that the scenic quality of the area is not diminished. The scenic quality of the area is the reason for the development of this tourism area in the first place. This tourism area lends itself water sport-related activities.

c. Sharpeville
The Sharpeville Memorial Initiative, with its signing of the Constitution and the Peace Treaty of 1902, has the potential to attract day visitors and tourists from Gauteng and abroad to the Emfuleni region. Emphasis should therefore be placed on the development of this historical site according to the existing development proposals. Such initiatives would draw day visitors and overseas tourists, which in turn will encourage the growth of the local tourism sector and help diversify the local economy.

**TABLE 35: PROPOSED TOURISM AREAS**

<table>
<thead>
<tr>
<th>Tourism area</th>
<th>Attraction</th>
<th>Access</th>
<th>Potential uses</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerald Casino</td>
<td>River and resort</td>
<td>Direct and well developed</td>
<td>Resorts, water sports (boating) and formal tourist accommodation (e.g. lodges)</td>
<td>Re-evaluate casino product to increase visitation of this facility</td>
</tr>
<tr>
<td>Lochvaal Barrage</td>
<td>River and lagoon</td>
<td>Indirect and poorly developed</td>
<td>Water sports (boating), informal tourist accommodation (e.g. caravan parks and camping) and guesthouse accommodation</td>
<td>Control land use development to retain scenic quality of the area</td>
</tr>
<tr>
<td>Sharpeville</td>
<td>Heritage Site</td>
<td>Direct and well developed</td>
<td>Open air museums and tourist day facilities (e.g. restaurants and curio shops)</td>
<td>Developed historical site according to the existing development proposals</td>
</tr>
<tr>
<td>Three Rivers</td>
<td>River</td>
<td>Direct and well developed</td>
<td>Tourist day facilities (e.g. restaurants and curio shops) and guesthouse accommodation</td>
<td>Encourage a better linkage between nodal area and river</td>
</tr>
<tr>
<td>Vaal Oewer</td>
<td>River and</td>
<td>Indirect and poorly developed</td>
<td>Camping, hiking trails and guesthouse accommodation</td>
<td>Control land use development to retain scenic quality of the area</td>
</tr>
<tr>
<td></td>
<td>mountainous area</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2012

d. Three Rivers

Three Rivers is a residential area within Emfuleni that is located on the Vaal River. It therefore has direct access to the river, which in turn provides it with tourism potential. The characteristics of the area make it suitable for tourist day facilities (e.g. restaurants and curio shops), as well as guesthouse accommodation linked to the residential component of the area. A means of improving the tourist potential of the area would be to establish a better link between the regional node of Three Rivers and the Vaal River. This linkage should focus on pedestrian access and the need to provide leisurely access to the river.
e. Vaal Oewer

The Vaal Oewer tourist area is situated within a scenic natural environment, characterized by mountainous topography. This environment can form the basis of eco-tourism activities. This requires eco-tourism facilities, such as camping sites, hiking trails and guesthouse accommodation. To ensure the long-term sustainability of the Vaal Oewer tourism potential, it will be imperative that the natural environment is conserved within this part of the Municipal Area.

In addition to the tourism areas mentioned above, gateways are important areas related to the tourism industry. Gateways can be defined as the entry and exit points to a tourism region. They are important because they give visitors and tourists to the region their lasting impression of the region. For this reason it is imperative that these gateways are treated in a manner that will attribute to a good impression. This has specific reference to the aesthetic and scenic qualities surrounding the gateways.

The entrance into Vanderbijlpark along Barrage Road is an important gateway, because Vanderbijlpark is the core area of the tourist industry within Emfuleni. The Sharpeville Dam is of particular importance in this regard. Protecting this environmental feature is necessary to ensure the tourism potential Sharpeville and the Vaal River. The N4 freeway is also an important access route and gateway to the tourism areas situated along the Vaal River. Visually pollution uses, such as transportation industries on smallholding, should be avoided at all costs along the N4 freeway. This requires strict land use control measures be exercised along the N4 freeway.

5.6.3. ACCOMMODATION

Tourism development can potentially create job and investment opportunities within Emfuleni and stimulate the economic development of the area. However, this will require investment in tourism infrastructure, such as access roads and tourist accommodation. The development of tourist accommodation is central to tourism development within Emfuleni area and thus needs to be done according to a unified set of criteria that is applicable to Emfuleni. This needs to be done to ensure a quality tourism environment is created within Emfuleni, which at the same time addresses the needs for local economic development and job creation associated with the tourist sector.
5.6.3.1. ACCOMMODATION TYPOLOGIES

Different guest accommodation establishment categories can be identified and are set out in the Table below. Such a classification allows a set of guidelines to be developed, which can be used to evaluate and regulated the tourist accommodation sector.

TABLE 36: TOURIST ACCOMMODATION TYPOLOGIES

<table>
<thead>
<tr>
<th>Typology</th>
<th>Description</th>
<th>Uses Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camping and Caravanning</td>
<td>A property used for erection of tents or other temporary structures for temporary accommodation for visitors or holiday-makers, which includes ablution, cooking and other facilities that are related to camping. This includes a caravan park, whether publicly or privately owned.</td>
<td>• Tents • Caravans • Communal Ablution Facilities</td>
</tr>
<tr>
<td>Bed and Breakfast Establishment</td>
<td>A dwelling house or second dwelling in which the owner of the dwelling supplies lodging and meals to guests who have permanent residence elsewhere; provided that the primary use of the dwelling-house concerned remains for the living accommodation of a single family.</td>
<td>• Second Dwelling • Residential Building</td>
</tr>
<tr>
<td>Guesthouse</td>
<td>A dwelling house or second dwelling which is used for the purpose of supplying lodging and meals to guests in an establishment which exceeds the single-family house restriction of a bed and breakfast establishment. A guesthouse may also have meeting and function rooms.</td>
<td>• Second dwelling • Cottages • Self-catering units • Meeting / Function Rooms • Residential Building</td>
</tr>
<tr>
<td>Backpackers Accommodation</td>
<td>A building where lodging is provided, and may incorporate cooking, dining and communal facilities for the use of lodgers. It includes a building in which rooms or beds are rented for residential purposes, such as a boarding house or youth hostel.</td>
<td>• Backpackers Lodge • Boarding House • Youth Hostel</td>
</tr>
<tr>
<td>Self-catering Units</td>
<td>A building or group of buildings consisting of separate accommodation units, each incorporating a kitchen facility, and which may include other communal facilities for the use of guests, which are rented for residential purposes. It may include holiday flats.</td>
<td>• Self-catering units • Communal Facilities • holiday flats</td>
</tr>
<tr>
<td>Hotel</td>
<td>A property used as a temporary residence for guests, where lodging and meals are provided. It may include restaurants, conference and entertainment facilities that are ancillary to the primary use as a hotel.</td>
<td>• Restaurant or bar • Conference Facilities • Entertainment Facilities • Wellness Centre and Spa</td>
</tr>
</tbody>
</table>
### Typology

<table>
<thead>
<tr>
<th>Typology</th>
<th>Description</th>
<th>Uses Included</th>
</tr>
</thead>
</table>
| Resort or Lodge     | Guest accommodation is subsidiary to the main use, which is of a recreational nature. The main use could be a golf course or similar recreational use. | - Clustered dwelling units  
                        |                                                                | - Restaurant or bar  
                        |                                                                | - Wellness Centre and Spa |
| Game Farm           | Guest accommodation is subsidiary to the main use, which is for the keeping of certain wild animal species. Game farming is further controlled by environmental and tourism legislation. | Clustered dwelling units  
                        |                                                                | - Restaurant or bar  
                        |                                                                | - Wellness Centre and Spa |

Source: Urban Dynamics Gauteng, 2012

5.6.3.2. IMPLEMENTATION GUIDELINES

Guidelines for the development of tourist facilities within Emfuleni can be an effective mechanism to manage the development of tourism facilities within Emfuleni and provide guidance when considering applications for such activities. These guidelines aim to (a) address the need for access to economic opportunities by supporting the guest accommodation industry, (b) promote a responsible and sustainable approach to guest accommodation development, (c) promote and safeguard the quality of life enjoyed by local residents, and (d) clearly state the land use requirements for establishing guest accommodation. The following guidelines are proposed in dealing with applications relating guest accommodation related to the tourism industry:

**a. Camping and caravanning**

Camping and caravanning sites are usually located in a unique and attractive natural environment. As such, a camping and caravanning site should be developed as a low impact and low intensity use that is in keeping with the context of the area and its surrounding character. A camping and caravanning site can consist of multiple free standing or linked structures of a temporary nature, and may include caravans and tents. Day visitors may be permitted and facilities for their use can be provided. The enterprise may be either in public or private ownership.

**b. Bed and breakfast**

Part of a dwelling house or second dwelling can be converted to accommodate guests. Breakfast is usually served to residents. Guests may share communal facilities, such as bathroom facilities, or it may be en-suite and private. The architectural appearance and scale of the single residential dwelling unit must be maintained in order to continue to fit...
the character and context of surrounding residential environment. The Bed and Breakfast Facility may have a minimum of 3 and a maximum of 6 bedrooms.

c. Guesthouses

Guesthouses may be part of a larger single family dwelling house or second dwelling converted to accommodate guests. Part of the dwelling may be provided in a second dwelling. Buildings can be free standing or linked structures. Council may restrict the number of rooms per establishment to mitigate the impact of the establishment on the surrounding residential area. Breakfast is usually served to guests. Guests may share communal facilities or may have en-suite facilities. The guesthouse may have a minimum of 4 and maximum of 12 bedrooms.

d. Backpacking and youth hostels

Backpacking and youth hostels provide low cost accommodation to traveling persons whose primary need is for a sleeping facility. Backpacking and youth hostels may contain communal areas, such as kitchen and dining areas and meeting rooms for the exclusive use of lodgers. A kitchen is available for self-help, but no meals are provided for guests. All facilities are communal. Usually there are no restrictions on the number of rooms or beds, but these must be appropriate for the building and surrounding area. However, Council may restrict the number of beds or rooms per establishment in cases and lay down conditions necessary to mitigate the impact of the establishment on the surrounding residential areas.

e. Self-catering apartments

Self-catering apartments is located in a building or a group of buildings consisting of separate accommodation units rented for residential purposes. Each unit incorporates a kitchenette and an ablution facility. The establishment may also provide meals communally to guests. There are usually no restrictions on number of rooms or beds. However, Council may restrict the number of beds or rooms per establishment in cases where it is necessary to mitigate the impact of the establishment on the surrounding residential environment.

f. Hotels

Hotels are purpose built building, which may consist of multiple free standing structures or a multiple storey single structure. These establishments provide separate rooms with at least one communal dining facility. Breakfast lunch and
dinner is served. No provision is made for self-catering. All provided facilities are for the exclusive use of the residing guests. No restrictions are placed on the number of rooms or beds. Council may, however, restrict the number of beds or rooms per establishment to mitigate the impact of the establishment on the surrounding areas. Proximity to major transport routes is an advantage.

g. Lodges and resorts

Lodges and resorts are purpose built and designed guest accommodation units for short term occupancy or use on time sharing basis. Such developments are often located in a unique environment. It can consist of multiple free standing, linked or single structures. Lodges and resorts may include ancillary facilities which are related to the establishment, such as ablution facilities, tourist facilities, recreation facilities, sports facilities, lecture rooms, restaurants, conference facilities, spa and wellness centre, caravan park and camping site. The scale of development is to be determined by contextual information, such as the environmental sensitivity of the area in which it is located, scenic or panoramic views, the carrying capacity for the environment, etc.

h. Game farms

Game farms are purpose built and designed guest accommodation units for short term occupancy or use on time sharing basis for holiday or recreational purposes. It is always located in a unique environment related to wildlife preservation, hunting or fishing recreation. It may include ancillary facilities that are related to the game farm, such as ablution facilities, tourist facilities, recreation facilities, sports facilities, and restaurants. A game farm consists of multiple free standing dwelling units that may or may not be linked to each other. All of the dwelling units must be clustered together and must not deter from the main function of the game farm. The density and design of the game farm must be determined by contextual information, such as environmental sensitivity, scenic views, and the carrying capacity for the natural environment.

The above is an attempt to provide a uniform approach to the management of guest accommodation across all accommodation typologies within Emfuleni. It attempts to provide assessment criteria for each of the accommodation typologies that can be used to approve a consent use or a rezoning application for the establishment of guest accommodation. It is recommended that a Site Development Plan be submitted prior to the approval of any consent use and rezoning right for the establishment of guest accommodation.
5.6.4. TOURISM FACILITIES

Apart from tourist accommodation, tourism facilities can be developed within Emfuleni that specifically aims to provide services and goods to tourists visiting Emfuleni. Tourism facilities can include cultural villages, farmers markets, information centre, etc. Importantly, tourism facilities must aim to depict the culture, activities and artifacts of the particular region in which it is located. The following guidelines should inform the establishment of tourist facilities:

a. Space and infrastructure

The amount of space needed for the envisaged buildings and visitor facilities of a tourism facility needs to be assessed before the approval of land use rights. Assess to municipal water and electricity capacity and adequate road access also needs to be determined before granting land use rights for the establishment of a tourism facility.

b. Parking

Sufficient parking needs to be provided to cater for tourists that arrive in their own transport. Thus, it is important to estimate beforehand the number of visitors that are envisaged. Importantly, parking for tour buses must be provided if tourist groups are to visit the tourism facility.

c. Amenity value

The location of tourism facilities must be such that the attractiveness of the surrounding area enhances the value of the tourist facility for visitors and tourists. For example, the site for the tourist facility must be free from unpleasant odours often associated with commercial farming practices.

d. Roads and accessibility

The location of tourism facilities must be such that it is easy for tourists using their own transport to find the facility. Thus the tourism facility should preferably be located within reasonable distance of a main road that is frequented by tourists. Permission must be obtained from the Provincial Department of Transport to construct new access points onto main roads.
e. Signage

Permission must be obtained for the erection of any signs advertising the location of a tourism facility. To erect a road sign in the road reserve (as distinct from on your own property) to advertising a tourism facility will require approval from the Department of Transport in the case of national roads, the Provincial Department of Transport in the case of secondary roads, and the Local Municipality in the case of local roads.

f. Zoning

Where the tourism facility will significantly change the currently land use, application must be made for a change in land use. Any special environmental, mining or other zones that could conflict with the intended tourism facility should be determined before granting land use rights for the development of tourism facilities.

g. Licensing and registration

The tourism facility may need to be registered as a business with the Local Municipality. If the tourism facility intends to serve meals, a trading license will need to be purchased. If liquor is to be sold on the establishment, application will need to be made for a liquor license.

h. Employment and partnerships

It is important to establish partnerships with neighbouring communities in order for them to have a sense of ownership in the tourism facility. As such, it is important for local people to be employed in the operation. The adequate training of tourism facility staff is also vitally important.

5.7. AGRICULTURE

The aim of this section of the report is to ensure that high agricultural land is adequately preserved and made accessible to both commercial and community-based commercial farmers. Even though agriculture is the responsibility of national and provincial government, local government still has a role to play in terms of land use management and the facilitation of investment opportunities to increase agricultural activities and production where possible.
Emfuleni is an important agricultural region within Gauteng, with both extensive and intensive farming constituting the agricultural sector within Emfuleni. Therefore, there is a need to protect the high potential agricultural land found within Emfuleni, provide mechanisms and incentives for the promotion of agricultural development, and determine the most appropriate subdivision criteria for agricultural land so as to ensure sustainability within the agricultural sector.

5.7.1. AGRICULTURAL DEVELOPMENT

Over the past decade, sustainable agriculture has been gaining increasing support and acceptance within the agricultural sector, because it is seen as a means of addressing the many environmental concerns that have arisen in relation to agricultural practices, including water shortage. Since agriculture is a primary economic activity within Emfuleni area, means that the mismanagement of agricultural resources can have an adverse effect on Emfuleni area at large. The need for the sustainable development of agricultural land in Emfuleni area is driven by the following overarching factors:

a. Agricultural land is a limited natural resource

There is limited agricultural in South Africa. South Africa has 122 million hectares of land surface, but only 82 million hectares is used for agriculture, of which most is used for grazing purposes. It is estimated that only 16 million hectares can be used for crop production and that only 3 million hectares of this land can be classified as high potential agricultural land. Only 1.3 million hectares of this land is irrigated.

b. Food security

Food security exists when a country’s people have access to sufficient food products to meet their dietary needs. Therefore, food security is not only dependant on how much food is available, but it is also dependant upon the range of food products needed by dietary requirements. A productive and diverse agricultural production sector is therefore fundamental to the food security of a country.
c. Climate change

Climate change, which is causing changes in the environment, is occurring at an ever increasing rate. Data shows that Southern Africa is experiencing longer dry seasons and rainfall that is becoming less reliable year-on-year. Such climatic factors will influence agricultural production over the long run. Consequently, there will be an increasing need to preserve land for the purpose of food production and to ensure food security.

Based on the principles of sustainable agricultural development, it is necessary to preserve land with high-potential agricultural solids to ensure food security, even if such land is not currently used for agricultural purposes. In part, this will require creating awareness about the value of agricultural land and the need to preserve it. The municipality will also need to provide a high level of certainty to landowners, decision makers and other stakeholders with regard to the status and future of agricultural land. This will require efficiency in decision-making on applications relating to the subdivision of agricultural land and the change in use of agricultural land.

5.7.2. LAND USE CHANGE

Land use change refers to applications which will result in farming activities ceasing and alternative uses brought about on land that is currently used for agricultural purposes. Activities are typically considered agricultural land uses are (a) the cultivation of land for crops or the grazing and breeding of animals, and (b) an enterprise for the processing of agricultural products, such as a canning factory. Other than this, there are non-agricultural uses that can be considered on agricultural land. These are as follows:

a. Mining and waste disposal sites

Mining and waste disposal sites could have severe impacts on agricultural activities if developed within agricultural areas. These could include damage to crops and livestock as a result of increased dust and ground water pollution, increased heavy vehicle traffic that damages roads, the fragmentation of farm land, and the impact on the long term desirability of farming in the area. Thus, considering applications to allow for mining or waste disposal sites within Emfuleni, must require an impact assessment to determine the impact of these uses on agriculture within Emfuleni. In addition, a set of conditions will be required regarding the mitigation of such impacts. No such development should be allowed on high potential agricultural land. Although the approval of mining operations is not a function of municipal government,
but a function of national government, Emfuleni should aim to be clear on their stand with regard to an application for mining rights. Emfuleni should, as far as possible, aim to influence the National Department of Minerals and Energy in this regard.

b. Nature reserves and resorts

Applications for land use change to allow for nature reserves or resort developments on agricultural land do pose certain concerns. Of greatest concern with such developments is that permission for such land uses often initiates the drive to obtain more land use rights for the nature reserve or resort in future. Typically, such additional rights involve application for low-density residential development. In general, land use change to nature reserves or resorts should only be considered under the following conditions:

- Resorts must not be permitted on high potential agricultural land
- Resort accommodation units should be clustered.
- Developers should indicate how potential impacts on adjacent agricultural land will be mitigated
- No water reserved for agricultural purposes may be used to serve the resort development
- The potential to re-establish the natural habitat where a nature reserve is being proposed must be demonstrated.

c. Game farms

A switch from livestock to game farming does not require permission for land use change, except where tourist accommodation is provided. It also does not require consent, except where veterinary permits are needed for the importation and keeping of certain animal species. With regard to accommodation for tourists, the criteria for resort developments should be made applicable. Secondary activities on game farms, such as farm stalls and function venues, can have potential impacts on surrounding agricultural activities, which should be taken into account. These could include noise and other types of pollution, additional non-farm related traffic volumes, and a general impact on the long-term desirability of agriculture in the area.
5.7.3. SUBDIVISION OF FARMLAND

The subdivision of farmland is largely underpinned by the principle of retaining viable economic farm units, because farm units that are too small are not able to provide a sufficient and sustainable income. Aspects that need to be considered when determining the viability of a farm unit in terms of its size, is the capacity of natural resource, particularly water, to support viable farming, and the yield potential of the agricultural soils.

In addition to the above, an Agricultural Hub is in force in the southwestern quadrant of Emfuleni. GDARD has demarcated this region of Emfuleni as a provincial Agricultural Hub. This provincial initiative requires this hub to be protected from urban expansion and densification. Because the Agricultural Hub is a Provincial initiative, it is considered a higher-order and therefore overriding land use initiative.

Based on the above, the following rural subdivision typologies can be identified and densification allowed accordingly, subject to the approval of the Department of Agriculture and subject to the subdivision NOT being located within the Emfuleni Agricultural Hub:

a. Rural residential areas earmarked for rural lifestyle living

Such rural residential areas provide a rural lifestyle for those families who wish to adopt such a lifestyle and are usually functionally already part of a rural settlement. In addition, when viewing such areas within the context of the larger Municipal Area, they fill in a characteristic residential gap within the larger Municipal Area. An important factor in defining these areas is the availability of bulk water, electricity and sewer.

The primary aim of these rural residential areas must be to maintain and enhance the rural character of the rural areas. Applying appropriate residential densities is central to maintaining such a rural character. Conventionally, a minimum subdivided stand size of 1 hectare should be supported within such rural residential areas. The subdivision of farms to stand sizes of between 1 and 4 hectare must be subject to the following conditions:

- The farm or farm portion is NOT located within the Emfuleni Agricultural Hub;
- Piped water is provided by a relevant authority, such as Rand Water;
- That the subdivision will not pose any pollution problems related to sanitation, and
- That the road infrastructure can handle the resulting increased traffic volumes.
b. Small farms earmarked for intensive farming purposes

Small farms provide farmland for intensive farming purposes and in particular for irrigation farming. Access to a river for irrigation purposes is therefore an advantage. The densities of these farms are much lower than those used for rural residential purposes, partly because they need to be of a sufficient size to enable viable farming, but also due to the limited capacity of transport, utility and social infrastructure. In many cases the need to protect the natural landscape and rural character of an area is also a factor. Typically, such rural areas have stand sizes of between 4 and 20 hectare in size. The subdivision of farms to farming units of between 4 and 20 hectare is size must be subject to the following conditions:

- The farm or farm portion is NOT located within the Emfuleni Agricultural Hub;
- The owner can prove to have adequate water supply from local sources, such as boreholes;
- That the subdivision will not pose any pollution problems related to sanitation, and
- That the road infrastructure can handle the resulting increased traffic volumes.

c. Commercial farms earmarked for extensive farming purposes

Commercial farms consisting of cadastral units that are larger the 20 hectares should be retained as such, whether inside or outside the Emfuleni Agricultural Hub. The status quo of such areas in terms of farm unit size and land use should thus be maintained, except in the following cases:

- Subdivision needed for infrastructure development, such as a road or railway line.
- Subdivision needed for existing or proposed community facilities, such as community halls, churches and schools.
- Subdivisions in order to consolidate to create more functional agricultural units.

The Subdivision of Agricultural Land Act (Act 70) controls the subdivision of agricultural land, which falls under the jurisdiction of this Act. The National Department of Agriculture is responsible for the Act and therefore deals with the subdivision of agricultural land. Land within Emfuleni that does not fall under Act 70, falls within the jurisdiction of Emfuleni. Where land is not under the jurisdiction of Emfuleni, the Municipality can make comments on the applications for subdivisions, based on the guidelines set out in this Emfuleni SDF.
5.7.4. AGRI-INDUSTRY

Agri-industry refers to buildings and infrastructure that are required to accommodate the processing of agricultural products. In fact, a large part of agricultural production undergoes some degree of transformation between harvesting the agricultural products and final use. It includes industries that are engaged in the initial processing of agricultural commodities, such as rice and flour milling, leather tanning, cotton ginning, oil pressing, saw milling and fish canning. It also includes industries that undertake further manufacturing operations on products made from agricultural materials, such as bread, biscuit and noodle making, textile spinning and weaving, paper production, clothing and footwear manufacturing.

The development of agri-industries can also have many beneficial feedback effects on agriculture itself. The most direct one is, of course, the stimulus it provides for increased agricultural production through market expansion. The promotion of agri-industries usually facilitates a substantial increase in employment opportunities. Even if the agri-industrial process is itself capital-intensive, considerable employment may be generated. Agri-processing industries typically employ around 20 to 30 percent of the total labour force employed in manufacturing in developing countries.

5.7.4.1. LOCATION OF AGRIC-INDUSTRY

The location of agri-industries is largely linked to the availability of agricultural raw materials and low-cost labour. Other factors, such as transport, also determine the location for an agri-industry. Most agricultural products either lose weight and bulk in processing, meaning they can be transported more cheaply after they have been processed, or they are perishable and so can be more easily transported in processed form. The location of agri-industries is also affected by the availability of power and other infrastructure. Based on the above, the following location criteria should apply when evaluating an application for the establishment of an agri-industry:

- The agri-industry should be located near the agricultural product to be processed
- The agri-industry be located near an unskilled labour market
- The agri-industry must have access to a major road network. This requires careful consideration in order to avoid overloading and traffic congestion.
- The agri-industry must have access to electrical power infrastructure and capacity and in selected cases abundant water sources
- If possible, agri-industries should be grouped in order to achieve economies of scale
• Agri-industries should preferably not be located on high-potential agricultural soils

5.7.4.2. LIMITING ENVIRONMENTAL POLLUTION

Despite the important contribution of agri-industries to overall agricultural development, agri-industries can also give rise to undesirable environmental side-effects. Left unchecked, as in any other manufacturing industry, agri-industries can create environmental pollution through the discharge of organic or hazardous wastes into water supplies or the emission of dust or gases that could affect air quality.

The risks of pollution are smaller at the initial stages of processing, but they tend to increase with the level of physical and chemical alteration, particularly in the industries using outdated equipment and technologies. The size of the industry could also be an important factor. Smaller industries often tend to be more polluting than larger agri-industries. This is often so because small industries often lack the financial resources to use modern and clean technologies.

Another form of pollution is visual pollution. This type of pollution occurs where an unsightly building is placed in a scenic environment. This type of pollution can have many negative impacts, such as impacting on the tourism potential of an area or reducing the value of neighbouring residential properties. Taking into account that Emfuleni is an important tourist destination, the visual pollution of agri-industrial buildings should be avoided at all costs. To this end, the following guidelines should be followed when establishing agri-industries:

• Agri-industries must not be located in gateway positions
• Agri-industries must not be located near tourist attractions or facilities, such as guest lodges
• Agri-industries must not be located along scenic routes or tourism routes
• Agri-industries must not be located in highly visual positions which disrupt views of natural landscapes
5.8. URBAN RENEWAL PROGRAM

5.8.1. VEREENIGING URBAN RENEWAL PROJECT

The edge city phenomenon which featured principally nationally and internationally over past twenty (20) years precipitated the exodus of prime businesses from traditional CBDs to regional and local retail centres (malls) and part of the decline of most CBDs can be attributed proportionally to the growth of such retail centres. In the case of Vereeniging, creeping decay is more pronounced in surrounding residential areas as more illegal land uses sprang up in the past 10 years resulting in further property depreciation and urban corrosion as well as escalating municipal maintenance cost and declining revenue level.

Many earnest endeavors to revamp CBD’s and attract private sector investments back into the traditional cities such as Johannesburg and Vereeniging were initiated by the National Departments including the National Department of Finance which delineated the Vereeniging Urban Development Zone (UDZ) area. The UDZ delineation enabled the government to facilitate urban regeneration scheme to incentivize private sector investments by providing tax rebates for developers who invested funds in upgrading or redeveloped the built-form or indulged in green development of areas within the demarcated UDZ area. The introduction of the Vereeniging inner-city regeneration projects complements rather than replaces existing such developmental initiatives. The aforementioned project will add impetus to all initiatives aimed at making Vereeniging CBD a major commercial, government and tourism hub in Emfuleni and greater Sedibeng area. Based on existing fiscal and developmental constraints, parcels of land enjoy high propensity for development of a fully fledged river city.

5.8.2. PROJECT LOCATION

The subject site is located to the East of R59 Motorway, West of Vaal River and North of Barrage Road as illustrated in the Diagram 27.
5.8.3. PROJECT MAIN OBJECTIVES

The main objective is to achieve a holistic development vision and plan for the development of (the) area into a sustainable human settlement". Strategic interventions could include: tax incentives to businesses to attract businesses back to the CBD; the improvement and maintenance of infrastructure and buildings (including the enforcement of municipal by-laws); the
maintenance of parks, open spaces and areas around public buildings; the identification of areas that could be redeveloped for alternative uses and the demolition of areas to create a mixed use area. See illustration in the **Diagram 28** below.
5.9. VAAL LOGISTICAL HUB

5.9.1 PROJECT BACKGROUND

Proposed Logistical Hub on parcels of land directly adjoining Arcelor Mittal Industrial establishment to the west is envisaged to incentivize catalytic public and private sector investments in Emfuleni area. The concept is a product of learned international best practices as is the potential for revamping new sustainable innovative economic activities. The existence of logistical hub will provide Gauteng Provincial Government with ample opportunities to actualize the concept of Special Economic Zones (SEZ) by raising the levels of domestic and foreign direct investments in order to accelerate growth and employment in the Vaal region.

Emfuleni local Municipality in consultation with other role players such as Transnet, Arcelor Mittal and the Gauteng Department of Economic Development has reached a substantive agreement that a logistical hub be considered as one of important flagship projects within Vaal area.

World-wide air cargo traffic is expected to more than triple by the year 2030 and number of commercial aircraft in service will rise from 19,410 to 39,530 according to Boeing Market Outlook (11 June 2011). The proposed Vaal Logistical Hub is expected to provide O.R. Tambo with a suitable strategic regional logistic facility to the mutual benefit of both Emfuleni and Ekurhuleni Municipalities.

Locally, the logistical hub will contribute in ameliorating burdening transport costs, environmental unfriendly traffic congestions make Emfuleni area more attractive to local and foreign investments and create employment opportunities which may have otherwise not been realized.

5.9.2 POTENTIAL COMPONENTS OF THE VAAL LOGISTICAL HUB

- Transnet container Depot
- Vaal Industrial Development Zone
- Airport
- Warehouses/Storage Facilities
- Vaal Intelligence Information Infrastructure

**5.9.3 POTENTIAL BENEFITS FOR THE ESTABLISHMENT OF VAAL LOGISTICAL HUB**

- It will attract new investment, economic development and create job opportunities that will address the huge pool of unemployment within the Vaal area;
- It will afford local people who has been disadvantaged to participate in the economy through partnering, business establishment, training, skills development,
- It will create a greater demand for Arcelor Mittal’s manufacturing output;
- The location of the VLH at the local source of inputs at the Arcelor Mittal will be a competitive advantage to Emfuleni, thereby minimizing the transport cost of the raw material;
- It will diversify and grow the Vaal economy to follow the international trends;
- It will create various opportunities focusing on BBBEEE and SMME’s within the area;
- It will improve the quality of life of the local community, especially the unemployed and the poor;
- Kick-starting downstream manufacturing in Emfuleni.

**5.10. AIRPORT**

Air and land based transport systems impact not only on the pattern and form of land uses but also on economic development landscapes of immediate areas. The former (air transport system) provides the only means that can be used to reach remote or inaccessible areas, or regions not well served by land transport systems. Development of regional airports or feeder airports can have positive impacts not only in terms of reduction of congestions at the main international airports such as the OR Tambo Airport but also potentiating the socio-economic development of the areas close to the airport.

The construction of regional/feeder airport in Emfuleni will not only result in regional economic spin-off in terms of increasing prospective facilitation of investments and enhanced tourism opportunities but also budding potential logistical opportunities
will be equally maximized in greater Vaal area. Global indications point to air traffic growth rates exceeding global GDP and world trade in the aftermath of the current global economic slump. Revenue passengers-kilometers is expected to grow by five percent (5%) per annum and cargo traffic by six percent (6%) over the next twenty years.

Already OR Tambo International airport and Rand Airport in Ekurhuleni are experiencing cargo and passengers growths unlikely to be satisfied by current and future expansion plans due to land development and infrastructural constraints. Thus, such constraints present opportunities for development of regional/feeder airport in Emfuleni to support national and international logistical needs.

More importantly, the proposed airport is expected to provide invaluable infrastructural support systems and enhance business viability to the proposed logistical hub to be established on parcels of land immediately west of the Arcelor Mittal, north R57 and east N1 Freeway. At least the proposed airport should have been built by the year 2025. The location of existing airstrips in Emfuleni are not suitably located close to major transport infrastructural facilities, existing and proposed industrial hubs to support future logistical needs of the Vaal area. These existing airports as mentioned in Section 2.4.5 (near Roshee and Bophelong areas) have become more attractive for satisfying human settlement needs and business opportunities respectively since they are gradually becoming less viable sites for satisfying future commercial and business needs of a growing greater Sedibeng area.
SECTION 6: LAND USE MANAGEMENT

6.1. LAND USE MANAGEMENT CYCLE

The Development Framework proposed in the previous section of this report, provides the platform for a Land Use Management System (LUMS). The Land Use Management System is therefore informed by the Development Framework and should aim to manage the implementation of the framework proposals.
The preparation of a Land Use Management System requires an understanding of the Land Use Management Cycle. The Land Use Management Cycle can be described as an interactive relationship between three major components, namely Development Management, Investment Value and Services Provision (see Diagram above). The interactive relationships between these components can be described as follows:

a. Development Management

Development Management aims to manage land use development within an area in order to maximize the development potential of an area. The Spatial Development Framework and Town Planning Scheme are the primary tools of Development Management.

b. Investment Value

Investment will only take place and be sustainable when the system regulating development is clear and has a set of rules whereby investors can invest in an area. Development Management provides such a set of rules for investment.

c. Services Provision

Investment in an area will provide the funds necessary for developing municipal services and providing social amenities within the area. In turn, municipal services and social amenities will determine the development potential of an area.

6.2. DEVELOPMENT DENSITY

A critical element in developing more sustainable cities is applying higher urban densities than in the past. This has been necessitated by the inefficiency and high costs of existing spatial patterns, especially with regard to providing municipal services and public transport. For example, low urban densities result in long walking distances and therefore cannot support public transport effectively. Of particular importance is the integration of higher-density housing development and public transportation. Public transportation is and must be central to higher-density housing development, simply because households that typically live at higher residential densities are generally more reliant upon public transport to access employment opportunities.
Based on the above as a point of departure, specific minimum and maximum development densities are proposed for each of the Land Use Management zones dealt with in this section of the report. In particular, these densities aim to increase densities within the proposed activity nodes, which are centred on the existing and proposed public transportation routes and stations. The proposed densities are expressed in terms of height, coverage and Floor Area Ratio (FAR) for non-residential areas (such as nodes) and units per hectare (u/ha) for residential areas. The zoning terminology used in this report that is related to density is defined as follows:

a. Building Height

The height of a building can either be measured as the height of the roof of the building or as the number of storeys of the building. In this document, the number of storeys is used as the measurement of building height. A storey is that part of a building between the surface of one floor and the ceiling immediately above. Basement parking is not considered a storey in this Emfuleni SDF.

b. Coverage

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

c. Residential Density

DIAGRAM 30: DENSITY MEASURES
Density refers to the intensity of development within a zoning district. In residential areas, density is generally measured by the maximum number of dwelling units permitted per hectare of land (e.g. 20 units/ha). Residential density can be expressed as nett or gross density. Nett residential density (see Diagram above) refers to the density on a specific site, excluding public roads, social facilities and public open space, thus including only the area allocated for residential use. Gross residential density refers to the density of a specific site including the land occupied by infrastructure, social and economic facilities, such as schools, shops, open space and roads. **Nett density is used when referring to residential density in this Land Use Management section of the Emfuleni SDF.**

d. Floor Area

The floor area of a building is the sum of the area of each floor of the building, excluding fire escapes, parking space, access passages, lift housing, and balconies.

e. Floor Area Ratio (FAR)

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

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

6.3. LAND USE MANAGEMENT ZONES

The Land Use Management System aims to implement the Development Framework proposals through applications for land use change, such as township establishment applications. The Land Use Management System comprises the following mutual supporting elements:

- Demarcated zones: Emfuleni was divided into a number of Land Use Management zones. These zones aim to promote the development of a specific land use character (as defined in the Development Framework) through the use of land use mix and density.
- Land use matrix: The Land Use Management zones are linked to a matrix. The matrix defines the land use mix and density to be allowed within each demarcated zone.

The Land Use Management (LUMS) zones aims to achieve specific objectives, as is set out in the Table below. The Land Use Management (LUMS) zones are demarcated on Figure 31, and in greater detail on Figures 33-42. The land use mix and density that are linked to these zones are set out in Table 37.

Zone 1: High-density residential zone

Zone 1 aims to encourage residential densities associated with a Central Business District (CBD) that supports a major public transport station, thus placing as many people as possible within comfortable walking distance of economic opportunities and public transportation. A maximum residential density of 60 units per hectare is allowed in Zone 1. A minimum residential density of 40 units per hectare is enforced in this zone to ensure that the necessary residential densities are developed to support the operation of public transportation. Land uses to be supported and
accommodated within Zone 1 include medium and high density residential typologies, as well as alternative forms of accommodation, such as boarding houses. Educational and other social facilities are also supported within Zone 1.

<table>
<thead>
<tr>
<th>Land Use Management Zone</th>
<th>Aim and Objective</th>
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<tbody>
<tr>
<td>Zone 1: High-density residential zone</td>
<td>Encourage residential densities associated with a Central Business District (CBD) that supports a major public transport station</td>
</tr>
<tr>
<td>Zone 2: Medium-density residential zone</td>
<td>Encourage residential densities that allows affordable housing development and supports road-based public transportation</td>
</tr>
<tr>
<td>Zone 3: Low-density residential zone</td>
<td>Maintain typical suburban residential areas</td>
</tr>
<tr>
<td>Zone 4: Primary Node (CBDs)</td>
<td>Concentrate retail, office and residential uses to serve regional sectors within the municipal area</td>
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<tr>
<td>Zone 5: Secondary / Regional node</td>
<td>Concentrate retail, office and residential uses to serve a cluster of residential neighbourhoods</td>
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<tr>
<td>Zone 6: Community node</td>
<td>Concentrate retail, office and residential uses to serve a single residential neighbourhood</td>
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<tr>
<td>Zone 7: Industrial and commercial zone</td>
<td>Provide for polluting industrial and commercial activities</td>
</tr>
<tr>
<td>Zone 8: Commercial and light industrial zone</td>
<td>Encourage and concentrate non-polluting commercial and light industrial activities</td>
</tr>
<tr>
<td>Zone 9: Open space zone</td>
<td>Enable the protection of environmental sensitive areas and geotechnically hazardous areas</td>
</tr>
<tr>
<td>Zone 10: Agricultural zone</td>
<td>Protect high-potential agricultural soils and allow of low-intensity residential uses where applicable</td>
</tr>
</tbody>
</table>

Source: Urban Dynamics Gauteng, 2012

Zone 2: Medium-density residential zone

Zone 2 aims to encourage residential densities that allows affordable housing development and supports road-based public transportation. A maximum residential density of 40 units per hectare and a minimum residential density of 20 units per hectare are allowed within Zone 2. Such densities typically allow for the development of a range of affordable housing typologies within this zone. Residential-supporting land uses to be accommodated within Zone 2 include educational facilities and medical facilities.
FIGURE 31: LAND USE MANAGEMENT ZONES