4. The spatial footprint

4.1 The impact of physical factors on development

The assessment of the physical determinants of development for the SDF used an overlay technique whereby a range of features form various datasets was assessed through the application of geographic information analysis. The aim was to build a composite map showing a land use suitability index that can guide development proposals in terms of physical opportunities and constraints.

The maps below show the composite development impact for each element based on all the factors assessed. It should be recognised that the areas of highest potential is not necessarily the preferred or optimal location for any particular use. This is determined by factors such as existing infrastructure, land ownership, institutional arrangements, and socio-economic variables. A strong spatial pattern emerges across all development zones which in the end complement one another but not without areas where there might be room for different dominant uses. The overall impact of topography and conservation priorities is evident across the board. On a more detailed scale these development areas define areas where particular developments can take place without large scale disturbances and conflicts with other uses. In the final analysis these maps indicate the development potential for each type of development and do not necessarily make pronouncements on the preferred use for any specific land parcel.

The next step was to recognise these constraints and develop a composite map of the municipal area that shows the ideal preferred dominant uses for the municipal area. In this process existing conservation areas and the mining belt was recognised and indicated as such on the map. Mogale City has a very well defined and established development footprint. There is also a very high correlation between the existing development patterns and the potential as was highlighted above.
Map 12: Constraints on urban development
Map 13: Constraints on rural development
Map 14: Constraints on crop farming
Map 15: Constraints on ranching activities
Map 17: Land use suitability preferences
4.2 Movement networks

Development potential is strengthened or weakened by it is accessibility and links with the broader development environment. Access, movement and functional linkages are described by:

- Road and rail links.
- The mode of transport utilised by households.
- The accessibility of major nodes.

The whole area is well covered by roads. The network typology is largely shaped by geographical factors with the development footprint contributing to increased network densities in the eastern sector with decreased densities towards the west. The interesting aspect highlighted on the next map is the fact that the major routes, such as those described in the table above did not have a marked impact on spatial development patterns. Historical patterns and the impact of development pressure from the Johannesburg Metropolitan core are much more pronounced.
The following are the major inter-regional road linkages between Mogale City and its neighbours:

### Table 9: Major road links

<table>
<thead>
<tr>
<th>To Tshwane</th>
<th>To Madibeng</th>
<th>To Johannesburg</th>
<th>To Randfontein</th>
<th>To Rustenburg</th>
</tr>
</thead>
<tbody>
<tr>
<td>R28/N14</td>
<td>R512</td>
<td>R512 (Malibongwe Drive)</td>
<td>R28</td>
<td>R24</td>
</tr>
<tr>
<td>R560</td>
<td>R512</td>
<td>Beyers Naude Drive</td>
<td>Randfontein Road (R41)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Randfontein Road (R41)</td>
<td>Hendrik Potgieter Drive</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Voortrekker/Ontdekkers Road</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Randfontein Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randfontein Road</td>
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</tr>
</tbody>
</table>

Although the municipal boundary describes the administrative unit, the function and impact of the urban core of the municipality does not necessarily follow the same boundaries. The extent of accessibility is shown on Map 19. The map clearly illustrates the dual nature of development in the municipal area. The eastern sector is generally very accessible and forms a continuous surface of accessibility linking the Krugersdorp-Muldersdrift area with the high intensity development to the east of the municipal area. There are no indications of breakpoint in accessibility in this area.

The western sector also shows high accessibility to Magaliesburg and Hekpoort but with a clear break between the development in the eastern sector and the development in the western sector of the municipal area. Not only is accessibility shaped by the availability of routes but more importantly by the geographical constraints in terms of the mountains and ridges running through the area. An interesting point is the relative inaccessibility of the Tarlton area. This area shows higher population densities than the areas adjoining it. Activities are centred around intensive agricultural activities. Notwithstanding the fact that the N14 runs through it, it remains relatively isolated from development in the east and west of the municipal area.
Map 19: Travelling time and functional service area