



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

LIMPOPO SPATIAL DEVELOPMENT FRAMEWORK

Phase 2: Spatial Analysis Report

Part D: Built Environment Analysis

31 March 2023

First Draft

The Office of the Premier

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The heartland of southern Africa - development is about people

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ABBREVIATIONS

Acronym Term

AAGR	: Average Annual Growth Rate
AAMP	: Agro-Processing Masterplan
ADZ	: Agricultural Development Zones
AfCFTA	: African Continental Free Trade Area
AH	: An Agricultural Holding established in terms of the Agricultural Holdings Act, 1919 (Act 22 of 1919)
AIDA	: Accelerated Industrial Development for Africa
AMV	: African Mining Vision
AU	: African Union
BEPP	: Built Environment Performance Plan
BIAT	: Boosting Intra-African Trade
BBLU	: Building Based Land Use
BDRR	: Blue Drop Risk Rating
CAADP	: Comprehensive Africa Agricultural Development Programme
CBO	: Community-based Organisations
CDP	: Cluster Development Programme
CIB	: Central Innovation Belt
CIR	: Capital Investment Framework
CLN	: Customer Load Network
CRDP	: Consolidated Rural Development Programme
CSIR	: Council for Scientific and Industrial Research
CRU	: Community Residential Units
COGHSTA	: Department of Cooperative Governance, Human Settlement and Traditional Affairs
CWP	: Community Work Programme
DALRRD	: Department of Agriculture, Land Reform and Rural Development
DCoG	: Department of Cooperative Governance
DDM	: District Development Model
DEA	: Department of Environmental Affairs (historical name)
DEFF	: Department of Environment, Forestry and Fisheries
DGP	: District Growth Point

DLRRD	: Department of Land Reform and Rural Development (historical name)
DM	: District Municipality
DMRE	: Department of Mineral Resources and Energy
DoT	: Department of Transport
DPME	: Department of Planning, Monitoring and Evaluation
DSAC	: Department of Sport, Arts and Culture
DSI	: Department of Science and Innovation
DWA	: Department of Water Affairs (historical name)
DWS	: Department of Water and Sanitation
EbA	: Ecosystems based Adaptation
EBSSST	: Electricity Basic Services Support Tariff
EDF11	: Economic Development Fund Programme 11
EPHP	: Enhanced People's Housing Process
ESA	: Ecological Support Area
EU	: European Union
FEPAs	: Freshwater Ecosystem Priority Areas
FLISP	: Finance-Linked Individual Subsidy Programme
FLNG	: Floating Liquefied Natural Gas
FOA	: Food and Agriculture Organisation of the United Nations
FPL	: Food Poverty Line
FPSU	: Farmer Production Support Unit
FTSEZ	: Fetakgomo-Tubatse Special Economic Zone
GAAL	: Gateway Airport Authority Limited
GDP	: Gross Domestic Product
GLeWAP	: Groot Letaba Water Augmentation Project
GLTP	: Greater Limpopo Transfrontier Park
GSDF	: Gauteng Provincial Spatial Development Framework
GTI	: GeoTerralmage
GVA	: Gross Value Added
HLEA	: Highest Level of Education Attainment
HSDG	: Human Settlements Development Grant
HSMP	: Human Settlements Master Plan
ICP	: International Cooperating Partners
ICT	: Information and Communication technology

IDP	: Municipal Integrated Development Plan	MGP	: Municipal Growth Point
IDPF	: Industrial Development Policy Framework	MMSEZ	: Musina-Makhado Special Economic Zone
IDZ	: Industrial Development Zone	MPSDF	: Mpumalanga Provincial Spatial Development Framework
IGF	: Intergovernmental Forum	MPT	: Municipal Planning Tribunal
IGFRA	: Intergovernmental Relations Framework Act	MSA	: Municipal Systems Act
IPILRA	: Interim Protection of Informal Land Rights Act, 1996	MTSF	: Medium Term Strategic Framework
IPRP	: Industrial Parks Revitalisation Programme	MuSSA	: Municipal Strategic Self-Assessment
IRDP	: Integrated Residential Development Programme	MYHSDP	: Multi-Year Human Settlements Development Plan
IRP	: Integrated Resource Plan	MYPE	: Mid-Year Population Estimates
ISPH	: Infrastructure Strategic Planning Hub	NAMP	: National Airspace Master Plan
IT	: Information Technology	NBA	: National Biodiversity Assessment
ITMP	: Integrated Transport Master Plan	NBF	: National Biodiversity Framework
IUDF	: Integrated Urban Development Framework	NBSAP	: National Biodiversity Strategy and Action Plan
JMPT	: Joint Municipal Planning Tribunal	NDC	: Nationally Determined Contribution
KNP	: Kruger National Park	NDP	: National Development Plan
KPA	: Key Performance Area	NDPWI	: National Department of Public Works and Infrastructure
LBPL	: Lower-Bound Poverty Line	NEDLAC	: National Economic Development and Labour Council
LDP	: Limpopo Development Plan	NEPAD	: New Partnership for Africa's Development
LED	: Local Economic Development	NERSA	: National Electricity Regulator of South Africa
LEDA	: Local Economic Development Agency	NGP	: New Growth Path
LEDET	: Limpopo Department of Economic Development, Environment and Tourism	NPAES	: National Protected Area Expansion Strategy
LIIMP	: Limpopo Integrated Infrastructure Master Plan	NRRA	: National Resource Risk Area
LIMCOM	: Limpopo Watercourse Commission	NSAA	: National Spatial Action Areas
LM	: Local Municipality	NSC	: North-South Corridor
LIMP	: Limpopo Industrialisation Master Plan	NSDF	: National Spatial Development Framework
LNP	: Limpopo National Park	NSTETR	: National Spatial Transformation and Economic Transition Region
LQ	: Location Quotient	NWRS	: National Water Resource Strategy
LRB	: Limpopo River Basin	OTP	: Office of the Premier
LSDF	: Limpopo Spatial Development Framework	PDPF	: Provincial Development Planning Forum
LSP	: Local Service Point	PGM	: Platinum Group of Metals
LTGS	: Limpopo Tourism Growth Strategy	PGDS	: Provincial Growth and Development Strategy
LTPF	: Long Term Planning Framework	PGP	: Provincial Growth Point
LUMS	: Land Use Management System	PHP	: People's Housing Programme
MEC	: Member of Executive Council	PHSHDAs	: Priority Human Settlements and Housing Development Areas
MIIF	: Municipal Infrastructure Investment Framework	PLTF	: Provincial Land Transport Framework

RAAVC	: Revitalisation of Agriculture and Agro-processing Value Chain	UBPL	: Upper-Bound Poverty Line
RAL	: Roads Agency of Limpopo	UISP	: Upgrading of Informal Settlements Programme
REDZ	: Renewable Energy Development Zone	UK	: United Kingdom
RSA	: Republic of South Africa	UN	: United Nations
RSDF	: Regional Spatial Development Framework	WHO	: World Health Organisation
RISDP	: Regional Indicative Strategic Development Plan	WHS	: World Heritage Site
SADC	: Southern African Development Community	WMA	: Water Management Area
SANBI	: South African National Biodiversity Institute	WSA	: Water Services Authorities
SANRAL	: South African National Roads Agency SOC Ltd	WSDP	: Water Service Development Plan
SAPP	: Southern Africa Power Pool	WSP	: Water Service Provider
SEZ	: Special Economic Zones	WWTW	: Wastewater Treatment Works
SIC	: Standard Industrial Classification	ZETDC	: Zimbabwean Electricity Transmission and Distribution Company
SIP	: Strategic Integrated Projects		
SWSA	: Strategic Water Source Area		
SACAD	: South African Conservation Areas Database		
SADT	: South African Development Trust		
SAMAC	: Macadamias South Africa		
SAPAD	: South African Protected Areas Database		
SDF	: Spatial Development Framework		
SDG	: Sustainable Development Goals		
SDI	: Spatial Development Initiative		
SEA	: Strategic Environmental Assessment		
SEZ	: Special Economic Zone		
SIPs	: Strategic Infrastructure Projects		
SLP	: Social and Labour Plans		
SOPA	: State of the Province Address		
SPLUMA	: Spatial Planning and Land Use Management Act		
StatsSA	: Statistics South Africa		
STISA	: Science, Technology and Innovation Strategy for Africa		
STOSAR	: Support Towards Operationalization of the SADC Regional Agricultural Policy		
STR	: Small Town Regeneration		
SWSA	: Strategic Water Source Area		
TBVC	: Transkei-Bophuthatswana-Venda and Ciskei states		
TFCA	: Transfrontier Conservation Area		
TRP	: Title Restoration Programme		

4 Analysis of the built environment

A detailed spatial analysis of the provincial built environment is presented in this document.

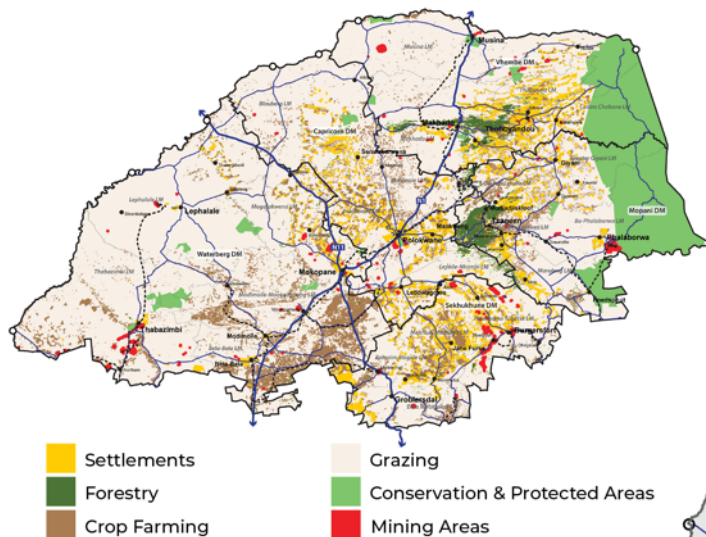
Limpopo has a spatial structure characterised by and established movement network and nodal system, set against a backdrop of rural regions with active resource economies. The following spatial issues were identified:

- The spatial structure of Limpopo has been determined by three factors that still play a role in its development and spatial transformation. Firstly, the movement network and the accessibility points it creates lead to the establishment and further development of nodes, notably those along the N1 and N11. Secondly, the local of natural resource areas shaped the rural productive landscape with large scale land uses such as agriculture, mining, tourism and nature conservation forming important elements of the provincial spatial landscape. Thirdly, the history of apartheid and former 'homeland' system established a pattern of rural residential development in mostly inaccessible areas leading to a high level of spatial disparity in the province.
- Current growth population and residential growth trends of dispersed rural settlements are reinforcing the disparate spatial structure that coincides with socio-economic vulnerability.
- The nodal and movement networks present an opportunity to plan for integrated regional-rural networks to ensure higher levels of spatial justice and access to socio-economic opportunity. This should be done in cognisance of the constraints of the natural resources such as water, productive land and energy.
- Spatial transformation is inked to spatial governance capacity and issues, which should strengths in aspects such as spatial planning but weaknesses in aspects such as legislative compliance infrastructure maintenance capacity.

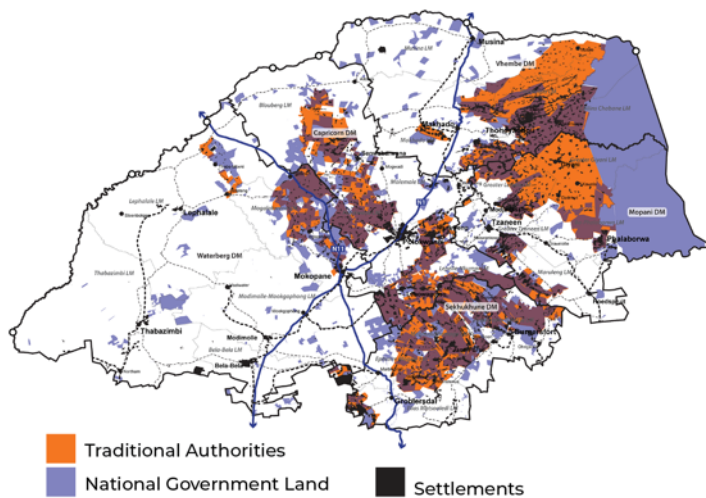
This document consists of the following sections:

- Structuring elements
- Built environment trends
- Spatial governance

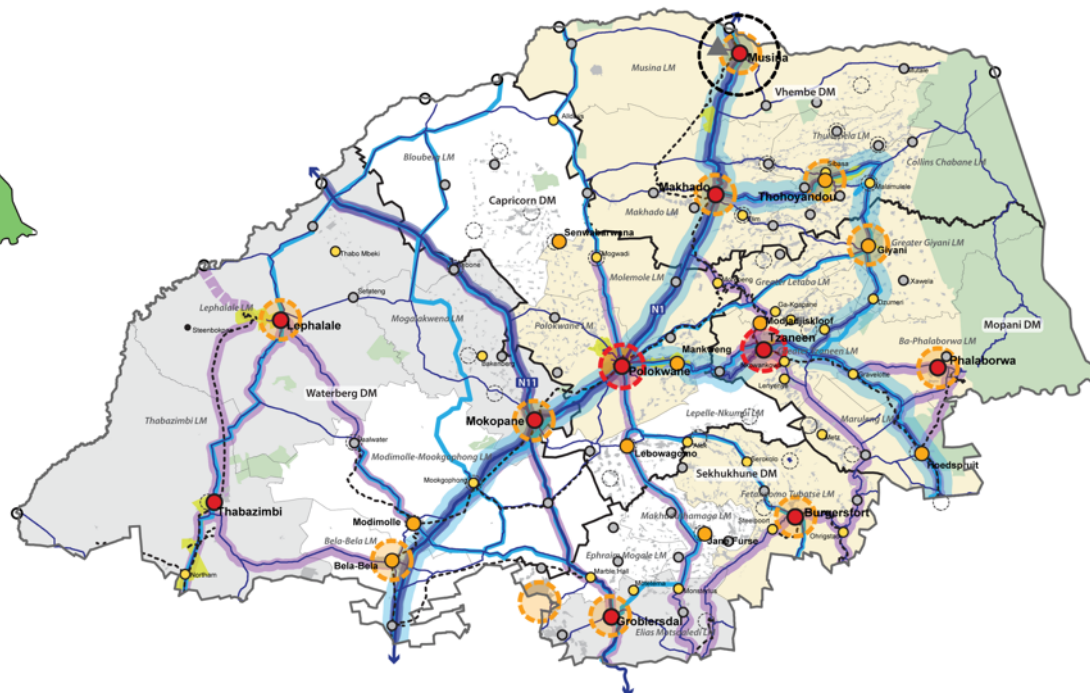
MACRO LAND USES



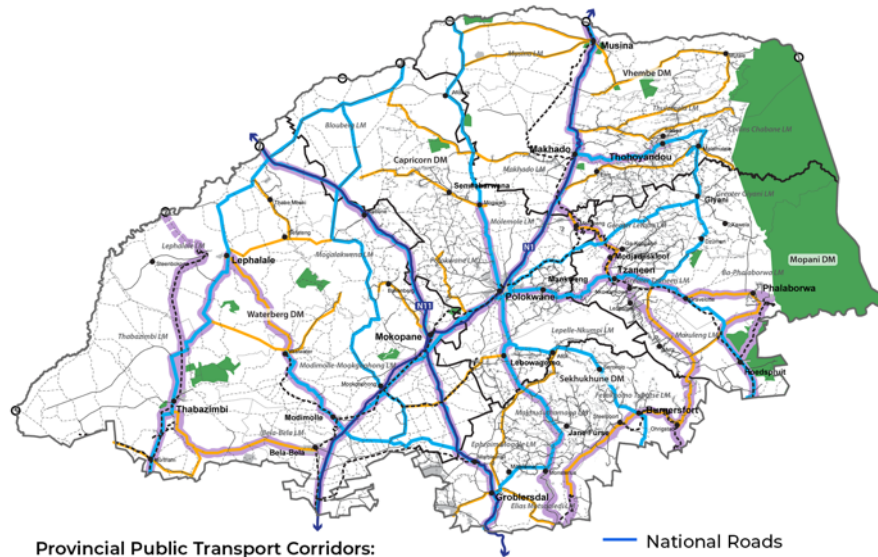
PROVINCIAL TENURE PERSPECTIVE



STRUCTURING ELEMENTS



MOVEMENT SYSTEMS



Provincial Public Transport Corridors:

- Inter-Provincial Public Transport Corridor
- Intra-Provincial Public Transport Corridor
- Limpopo Strategic Freight Network

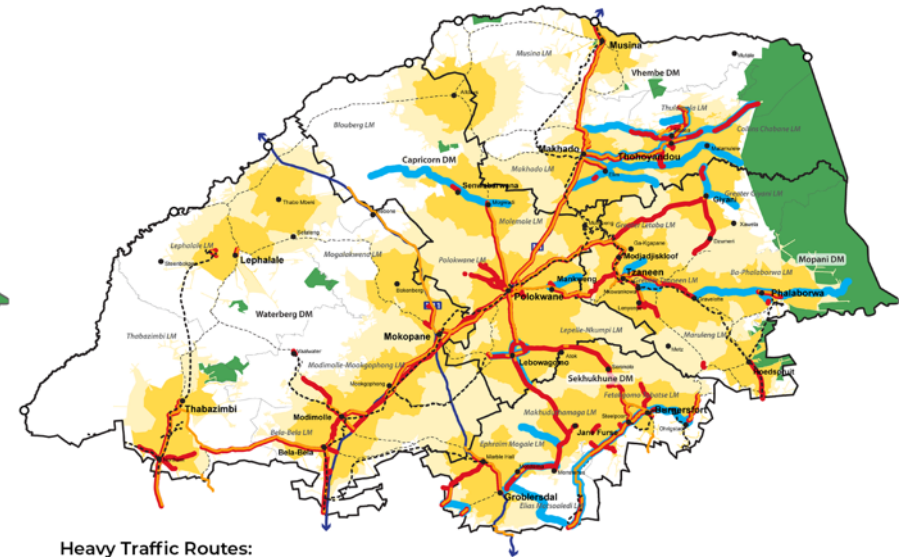
- National Roads
- Roads
- Gravel roads
- Railway Line



Settlement Pattern Categories:

- Scattered Settlements
- Clustered Settlements
- Linear Settlements
- Settlements
- Nature Reserves

ROAD TRAFFIC & CONNECTIVITY



Heavy Traffic Routes:

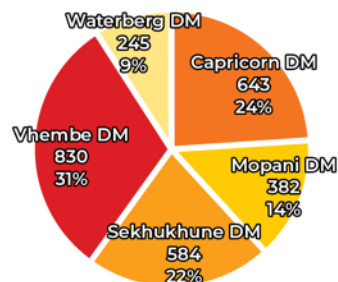
- Vehicles: 3001 - >10 000
- Heavy Vehicles: 501 - >2 000
- Public Transport: 30 001 - > 50 000

- National Roads
- Roads
- Railway Line

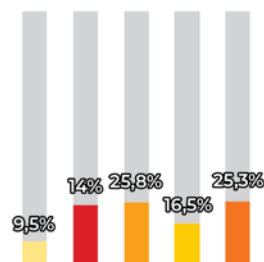
Travel Distance from Nodes: 0 - 30km 30 - 50km

- The provincial public transport corridors tend to run through the scattered and linear settlements in more rural areas, providing access to urban nodes, mines and other key economic activities.
- Heavy traffic for Public Transport can predominantly be found in, and to and from, the scattered settlements in more rural areas and urban nodes.
- The majority of the heavy traffic for normal vehicles can be found on the N1 and other national routes in the eastern part of Limpopo.
- Heavy traffic of Heavy Vehicles is predominantly found along the N11 and N1, all the way through Musina and across the border.

SETTLEMENT NUMBERS



Estimated number of settlements



% of settlement area of the province

SCENARIOS FOR FUTURE USE OF SPACE (LAND) FOR RESIDENTIAL PURPOSES

Scenario 1: Business as usual

In this scenario, it is assumed that growth in the rural areas will continue at the rate of 4.7 units/ha and in the urban areas at a rate of 8.8 units/ha, with an assumption that the rural households represent 78% and the urban households 22% of the total number of households in the province.

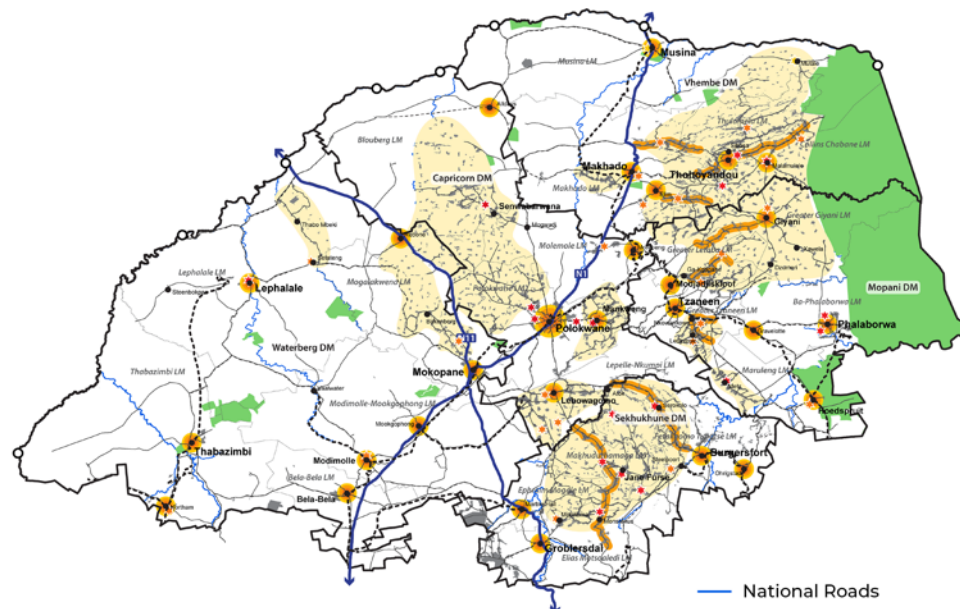
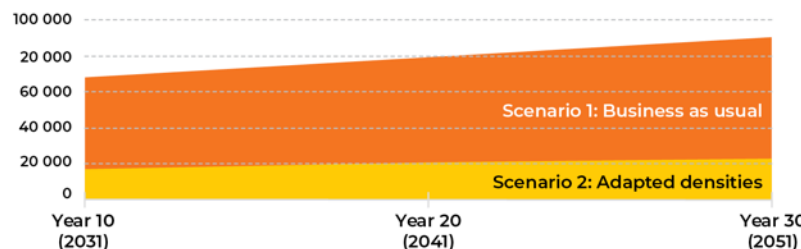
After a 30-year period (up to 2051), an estimated additional 238,265 ha of agricultural land will have to be released to provide for settlement growth. The land area covered by settlements will increase with +/-49% to 721,660 ha.

Scenario 2: Adapted densities

Scenario 2 assumes a slight increase in the urbanisation rate and that after 30 years, 25% of households will live in urban areas and 75% in the rural areas.

Densities is assumed to vary between 20 and 40 units/ha, which will accommodate even between 250 m² and 500 m² in size.

After a 30-year period (by 2051), an additional 60,174 ha will be required for settlement growth, which means that the area covered by settlements in the province will increase by +12% to a total area of 543,569 ha.



Settlement Pattern Categories:

- Scattered Settlements
- Clustered Settlements
- Linear Settlements

Growth Pressure:

- Low to medium
- Medium to high
- High to extreme

- National Roads
- Roads
- Railway Line
- Settlements
- Nature Reserves

CLUSTERED & NUCLEATED SETTLEMENTS

Mainly formal townships at the intersection of national and provincial routes, or areas with strong economic base and central place function.

The clustered settlements accommodate a large spectrum of community facilities and services such as government offices, shopping facilities and businesses, banks, medical facilities.

Population size: 15 000 - 30 000

Examples: Polokwane, Bela-Bela, Mokopane, Modimolle and Tzaneen.

SCATTERED & LINEAR SETTLEMENTS

Found mainly in the non-urban (rural) areas on state or communally owned land.

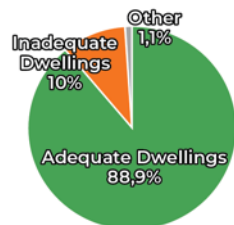
Linear settlements are more evident in traditional areas along routes or rivers.

Population size: Mostly 1000 - 2500, with an increase in 2 500 - 7 500 settlements.

Examples: Linear settlements are found in the Thohoyandou/ Sibasa area in the Vhembe district, along the main roads to Jane Furse and Burgersfort in the Sekhukhune district, and along the R71 from Polokwane to Mankweng and Badimong.

DWELLING TYPES PER CATEGORY

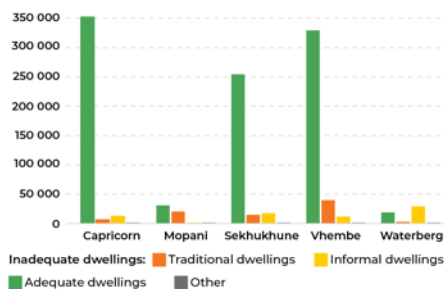
Limpopo Province Dwellings



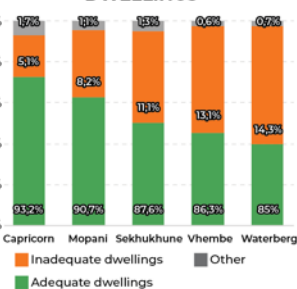
Informal residential structures:
117 153 → 125 777
2015 2020

Percentage Change
7,36%

DWELLING TYPES PER CATEGORY

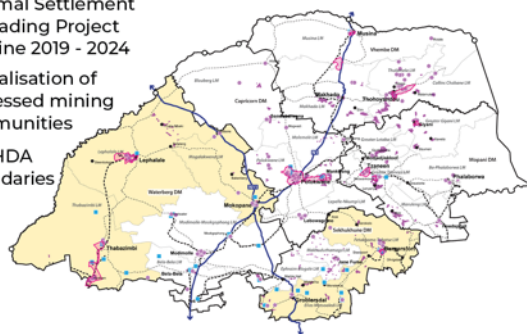


ADEQUATE VS INADEQUATE DWELLINGS

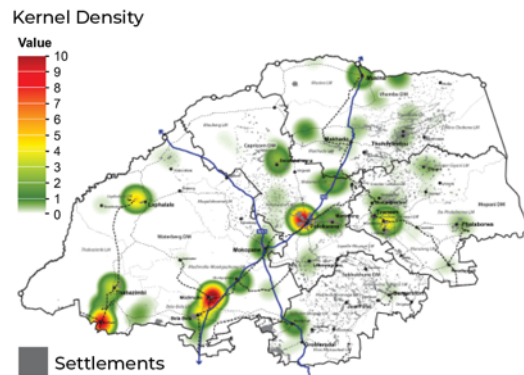


PRIORITY HUMAN SETTLEMENTS & HOUSING DEVELOPMENT AREAS

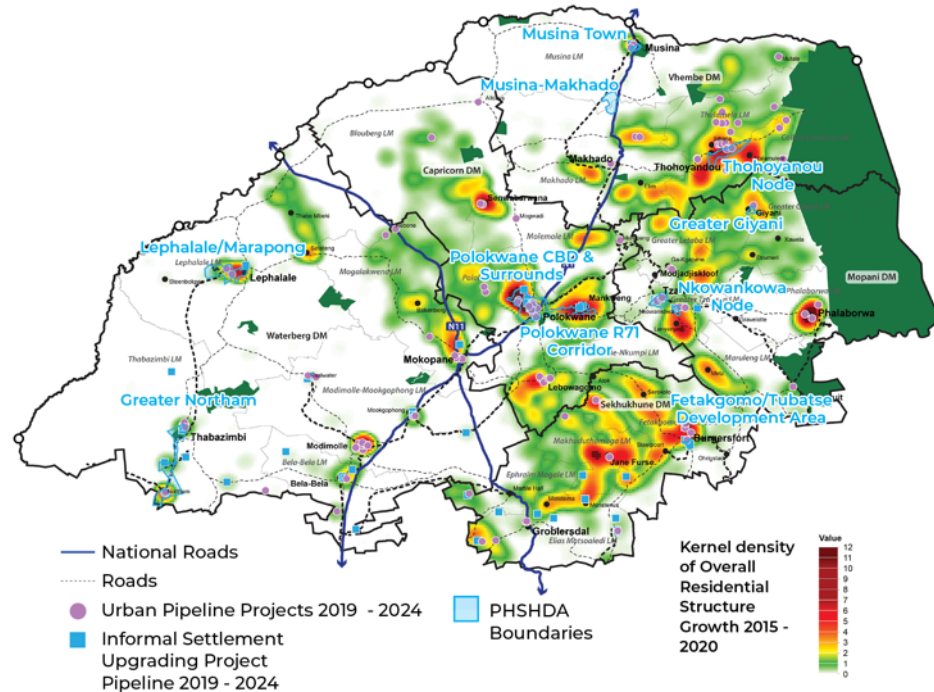
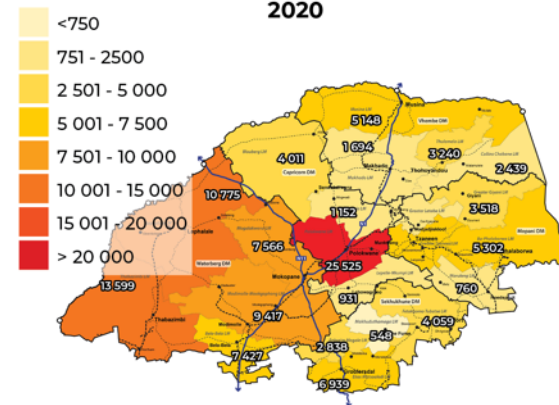
- Urban Pipeline Projects 2019 - 2024
- Informal Settlement Upgrading Project Pipeline 2019 - 2024
- Revitalisation of distressed mining communities
- PHSHDA Boundaries



KERNEL DENSITY OF INFORMAL DWELLING UNIT GROWTH



INFORMAL RESIDENTIAL STRUCTURES 2020



STRATEGIC INITIATIVES

NSDF Functional Town Hierarchy 2021:

- National Urban Node
- Regional Development Node
- Rural Service Centre
- NSDF Eastern Escarpment Spatial Transformation and Economic Transition Region
- NSDF National Development Corridor
- NSDF Key National Roads
- NSDF Key Regional Roads
- Inter-Provincial Public Transport Corridors
- Limpopo Strategic Freight Network

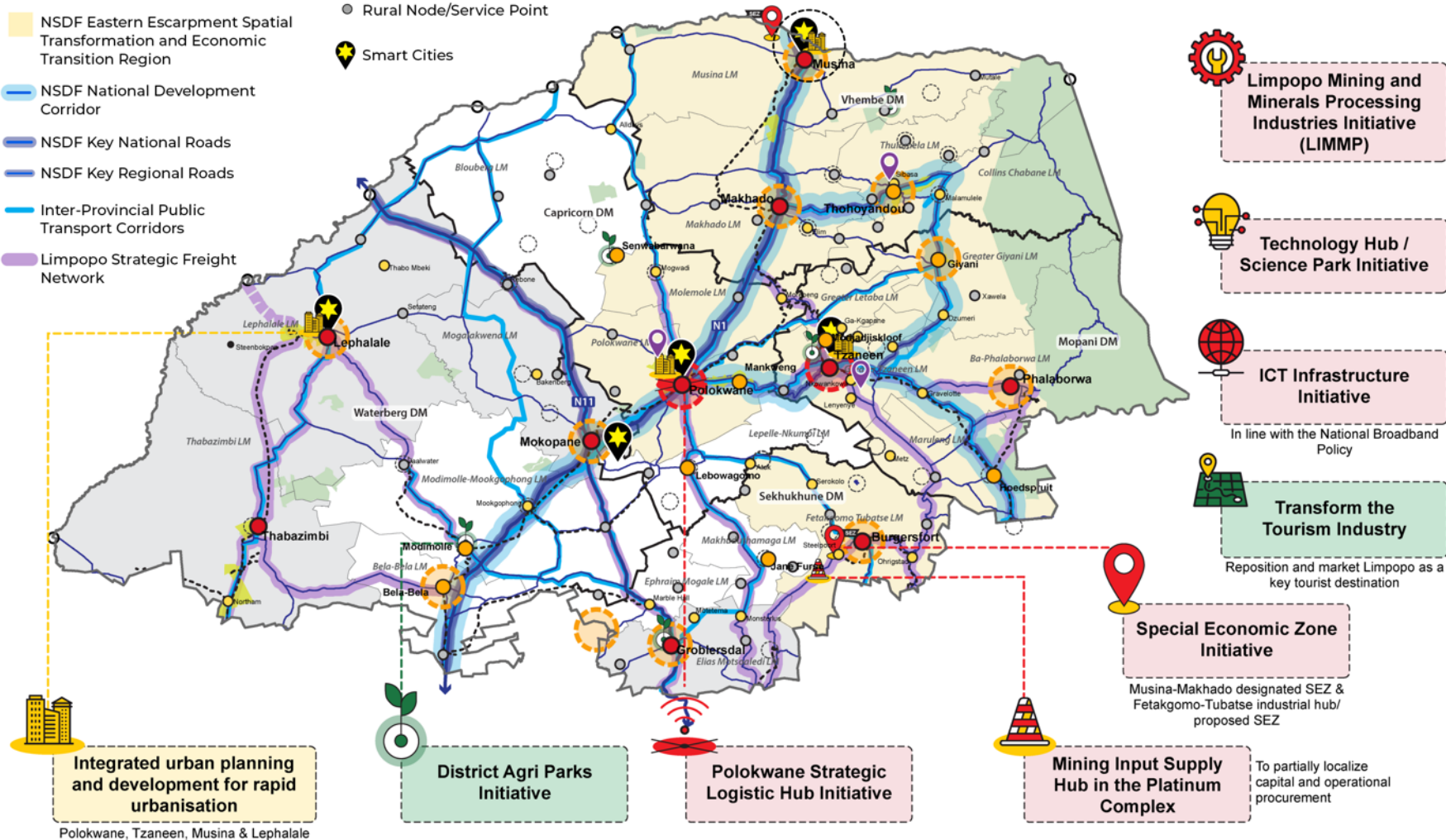
Limpopo SDF Growth Points 2016:

- Provincial Growth Point
- District Growth Points
- Municipal Growth Point
- Rural Node/Service Point
- ★ Smart Cities

Human Settlements Spatial Targeting:

- Priority Human Settlements & Housing Development Areas
- Revitalisation of Distressed Mining Communities Intervention

- Import/Export Node
- Railway Line
- Nature Reserves



4.1 Structuring elements

There are various biophysical and socio-economic elements that influence spatial patterns such as topography, natural resources, cultural and political influence etc. These elements have been analysed in the previous two chapters. The current spatial outlook of Limpopo is assessed in this section from a built environmental perspective. The elements that connect, structure and influence the spatial patterns are described and assessed. The key outcome of this section is to identify the drivers of settlement change and development in the province.

The built environment structuring elements analysed in this section, as well as the socio-economic and biophysical analysis, are indicated in Figure 1.

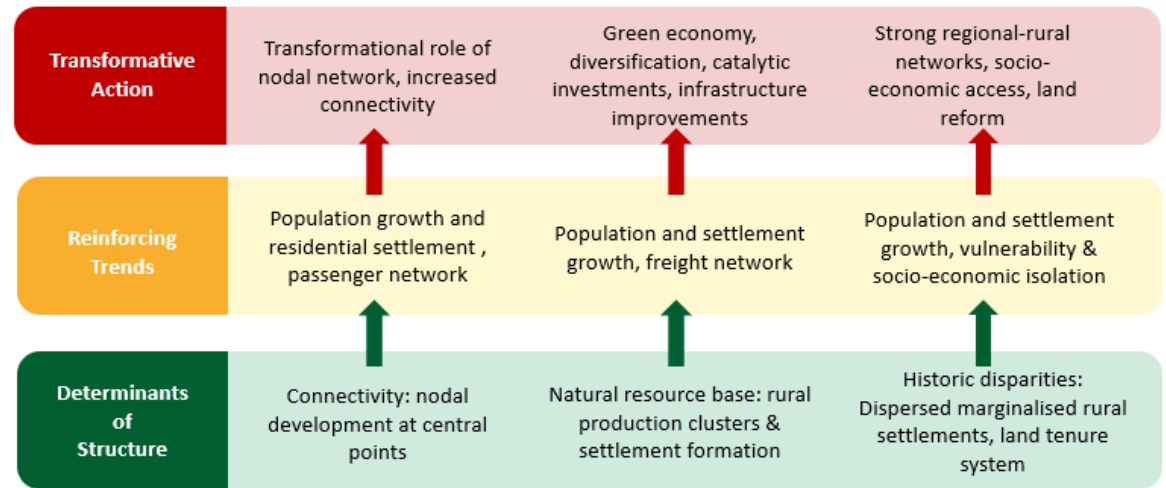


Figure 1: Built environment structuring elements

4.1.1 Inter-regional connectivity

The inter-regional connectivity of Limpopo comprises a network of national and regional roads.

Limpopo's road network has a tree-like structure: the N1 and N11 serve as truck or backbone roads that contribute to the strategic connectivity of the province to neighbouring provinces Gauteng, North West and Mpumalanga, as well as neighbouring countries Zimbabwe and Botswana. These two roads are also defined as **key national roads** in the NSDF, 2022 and are part of the **North-South Corridor**, as further described in Section 3.4.4 on logistics and freight in the socio economic analysis.

In the national road network, N1 runs from Cape Town in the Western Cape, through Bloemfontein, Johannesburg, Pretoria, Polokwane and other major towns, to Beitbridge in Limpopo, at the border of South Africa and Zimbabwe. The N1 is also the **Trans-Limpopo corridor**.

The N11 runs from Ladysmith in KwaZulu-Natal, through Ermelo and Middelburg in Mpumalanga, to the border of South Africa and Botswana in Grobler's Bridge in Limpopo.

The provincial regional road network encompasses an expanded network of roads than the network included in the LSDF 2016. Since 2016, the South African National Roads Agency SOC Limited (SANRAL) has taken ownership of regional roads previously owned by the province. The regional road network is described below and showed in Figure 2. Certain roads form part of a Limpopo road freight corridor as defined in the Limpopo Freight Databank, 2016, or are define as a key regional road in the NSDF, 2022.

- **Phalaborwa corridor:** The R71 and R36 are the spines of the corridor. The R71 connects Polokwane to Tzaneen and Phalaborwa. The R71 also divert to Hoedspruit/Bushbuckridge via the R40 towards Mbombela. Combined, the R71 and R40 is a **key regional road** in the NSDF 2022. The R36 runs from Ermelo in Mpumalanga, through Tzaneen and Mashishing (Lydenburg) in Limpopo, to the N1 between Polokwane and Louis Trichardt.

- **East-west corridor:** The corridors links Polokwane via Mokopane to Botswana via the border posts at either Grobler's Bridge or Stockpoort. The main regional roads include R510 from Mokopane to Grobler's Bridge and the diversion to Lephalale - Stockpoort, and the R567 from Polokwane to Gilead
- **Dilokong corridor:** The R37 is the spine of the corridor that connects Polokwane to Burgersfort and Nelspruit in Mpumalanga.
- The R555 connects the Dilokong corridor (R37) at Burgersfort, to the N4 and ultimately to Maputo to the east, as well as Middelburg/eMalahleni and Rustenburg to the west.
- Combined the R524 from Makhado to Thohoyandou, then to Giyani via the R81, from there, following the R529 to join the R526 near Gravelotte, and finally to Mbombela via Hoedspruit/Bushbuckridge. This combined route is a **key regional road** in the NSDF, 2022.
- The R33 runs from Pietermaritzburg in KwaZulu-Natal, through Mpumalanga, to Lephalale.
- Combined, the R572, R510 and R511 provide linkages from Gauteng, through the North West, through Thabazimbi and Lephalale in Limpopo, to the N11 towards Grobler's Bridge and the border with Botswana.
- The R101 mostly runs parallel to the N1 from Johannesburg in Gauteng to Polokwane.

Limpopo is connected to southern Africa through the nine border posts with neighbouring countries Botswana, Zimbabwe and Mozambique as shown in Figure 2.

Table 1: Border posts in Limpopo

Neighbouring country	Border post name	Closest town
Botswana	Derdepoort (Sikwane)	Northam (100 km)
	Stockpoort	Lephalale (76 km)
	Grobler's Bridge (Martin's Drift)	Lephalale (100 km)
	Zanzibar	Lephalale (190 km)
	Platjan	Lephalale (230 km)
	Pontdrift	Musina (100 km)
Zimbabwe	Beitbridge	Musina (18 km)
Mozambique	Giriyondo	Musina (170 km)
	Pafuri	Phalaborwa (100 km)

In addition to the road network, a network of rail freight corridors comprising of a coal system (Lephalale – Ermelo – Richard's Bay rail corridor) and north-eastern system (Phalaborwa – Richard's bay corridor and Gauteng – Zimbabwe corridor), provide intra-regional rail connectivity. More detail regarding the rail systems are available in the analysis of socio-economic environment in Section 3.4.4 on logistics and freight.

In general, the national and regional road networks connect all larger regions of the province and existing border posts. However, within the regions are concentrations of settlements that seem not to be adequately served by the regional network such as:

- The settlements in the north-western part of Blouberg are not well served and as a result, remain marginalised. Senwabarwana is one of the areas that experienced a significant settlement growth trend, yet it does not have direct access to the current regional network.
- There is a weak regional road link between Gauteng via the Moloto road and N11 at Marble Hall/ Groblersdal to Jane Furse and Lebowakgomo (R579), area.
- There is also potential for a regional road connection between the platinum and chrome operations south of Steelpoort and Mashishing/Lydenburg where the chrome smelter is. Currently, the mining and manufacturing industries around the R555 at Steelpoort make use of local road D212/R577 as the shortest route to Mashishing, and even assist to maintain it. Surveys have been done and proved that this connection carry higher truck volumes than the R37/Dilokong corridor. There are also daily commuting patterns between Mashishing and the Steelpoort area due to lack of adequate housing options in Steelpoort. The condition of the road is a safety issue due to the traffic modes and volumes, and a concerning risk to commuters and employers due to the high accident rate.
- There are large concentrations of settlements in Makhuduthamaga, Fetakgomo Tubatse, Greater Letaba, Greater Giyani and Collins Chabane where the settlements seem not to have adequate access to the regional network. It is noted that the topography of the area contributes to the network, however it is also recognized that these areas are some of the marginalised communities in the province.

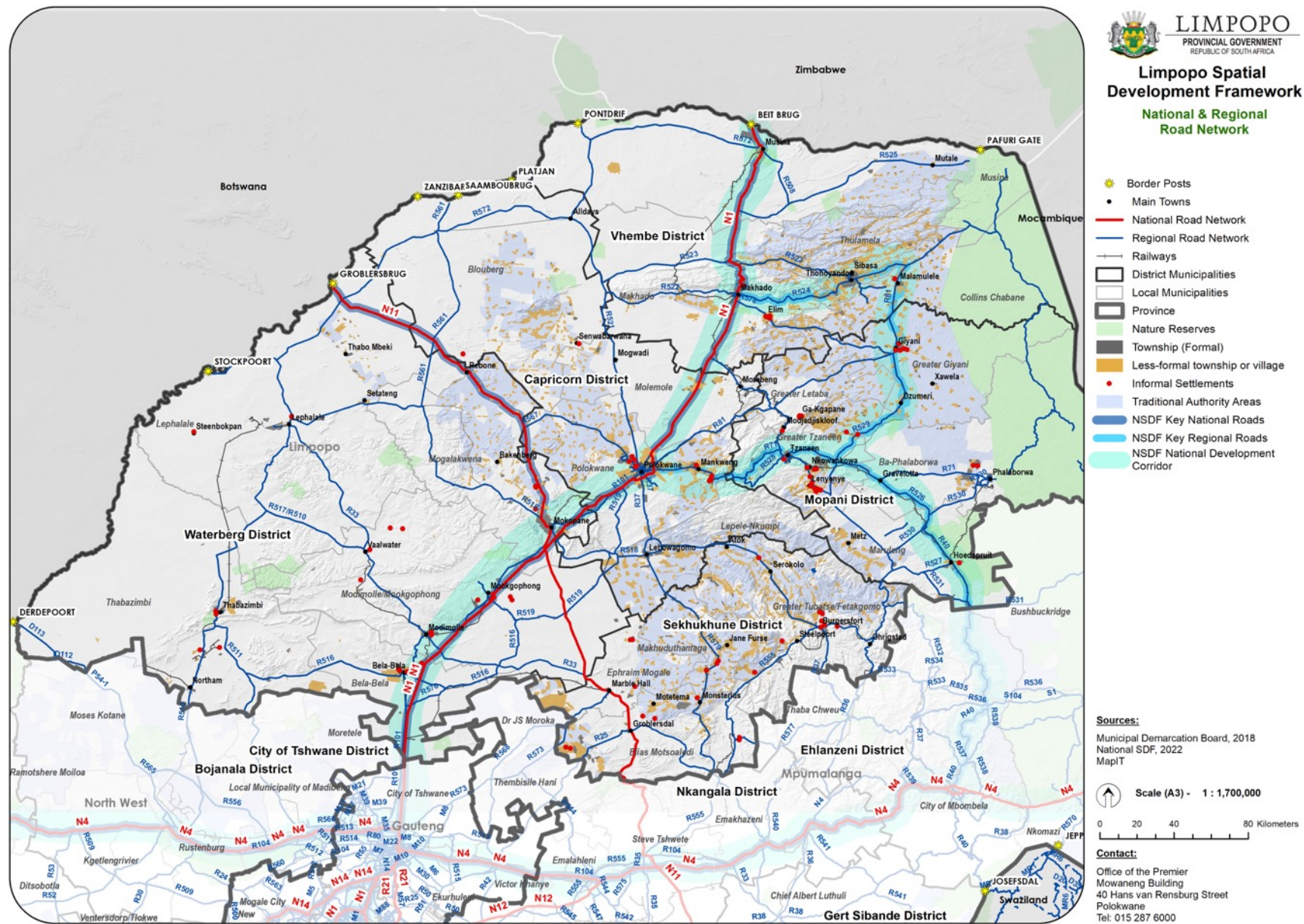


Figure 2: National and regional road network

4.1.2 Provincial land tenure perspective

Spatial patterns in Limpopo are influenced largely by the historical tenure and ownership systems, as well as the prevalent state of land ownership.

In 2017, a land audit report of private land ownership was developed by the former Department of Rural Development and Land Reform (Dept. Rural Development and Land Reform, 2017).

According to the land audit report, 7,758,940 ha of land in the province was under private land ownership in 2015, of which 51% were owned by companies¹, 22% co-owned and 17% by trusts. The percentage owned by the various types of private ownership is indicated in Figure 3.

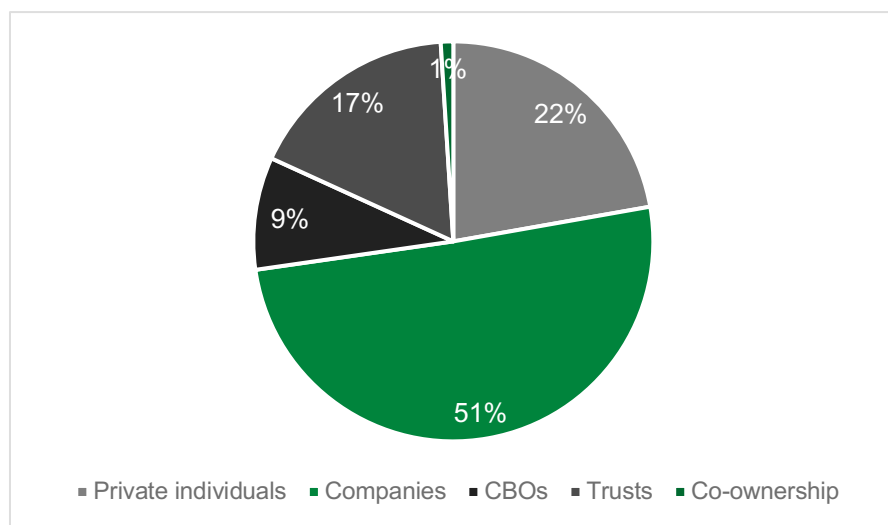


Figure 3: Division of privately owned land in Limpopo ²

Source: Land audit report, (Dept. Rural Development and Land Reform, 2017).

¹ Companies include close corporations and proprietary companies (Pty (Ltd)) but exclude public entities.

In this assessment, land ownership is categorised as privately owned land, state land (publicly owned land) and municipal owned land. The ownership types are differentiated in Figure 4 and spatially represented in Figure 5.

Private land	State land	Municipal owned land
<ul style="list-style-type: none"> • Freehold Title • Common Hold Title (Home owners association, Communal property association, community based ownership, church, traditional community owned) 	<ul style="list-style-type: none"> • National Government owned land • RSA in trust for traditional community • RSA under custodianship of traditional community • Provincial Government owned land • Land owned by State Owned Enterprises (SOEs) 	<ul style="list-style-type: none"> • Municipal owned erven • Municipal commonage

Figure 4: Types of land ownership

The most recent spatial data on state-owned land is awaited from the National Department of Agriculture, Land Reform and Rural Development, as well as the Department of Public Works. The latest data will be compared with the LSDF 2016 status of land ownership: state-owned land comprised 22% and traditionally owned land 6% of the total provincial land.

The 2016 spatial dataset of land ownership has been updated with selected areas where updated land ownership information was available from municipalities. The preliminary updated distribution of land ownership in the province is shown in Figure 5.

A glossary of tenure types is contained in Appendix A.

² CBOs include community property associations, churches, homeowners' associations and others.

From a spatial analysis perspective, state land owned by national government entities cover large tracks of land in the central and eastern parts of the province. State land is held for execution of national functions such as military and aviation purposes, protection of resources such as dams and infrastructure, and also include the two national parks namely the Kruger National Park and Marakele National Park.

The spatial pattern also reveals clusters of state land that are held either under custodianship for traditional communities or in trust, allowing communities an informal right to the land in terms of the Interim Protection of Informal Land Rights Act, 1991 (IPILRA). In addition, land is continuously restored to communities as reflected in the spatial distribution of Traditional owned land. This includes the release of State land to these communities. The main land tenure trend is this transition of land from the state and private ownership to communities.

This historical pattern created by the former homelands whereby land is held by the state for occupation by communities, has manifested in the scattered settlement pattern of the central and eastern parts of the province.

There are 156 recognised traditional authorities in Limpopo. Figure 6 depicts the correlation between state-owned land and areas under the custodianship of traditional authorities.

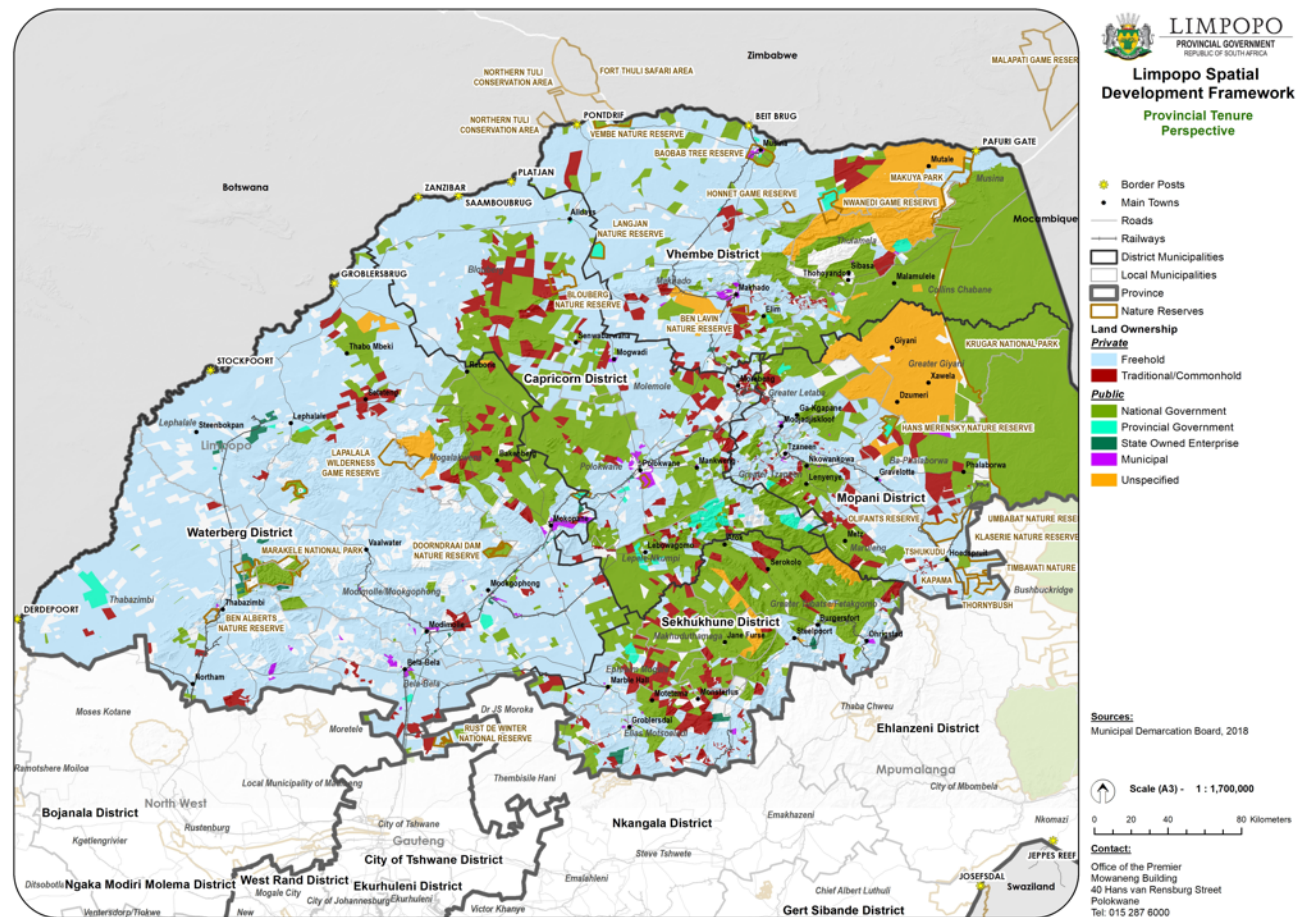


Figure 5: Limpopo land tenure perspective

The ownership system is not only impacting the settlement pattern, but also the occurrence of economic activity and land use patterns. Investment of large investments on communal owned land and/or state land sometimes require complex stakeholder engagement and approval processes, and leads to long lead times before developments can proceed. In other instances, the allocation of land continues without

an integrated development approach adopted by the municipality and have led to the fragmented and linear developments found primarily along main roads or road junctions.

Provincial Government of Limpopo is owner of the provincial nature reserves, provincial buildings and infrastructure, and in some instances, land surrounding towns. Municipalities primarily own land around the formal towns for municipal or conservation purposes. Very few municipalities have commonage to assist them with future township extensions. As a result, land for future township extensions is privately owned, or owned by provincial or national government and require the release of land. The release and transfer or state land is a very cumbersome process and has inhibited proactive township establishment of various areas. This situation, as well as opportunistic behaviour, has led to the emergence of informal occupation of state land. There is a strong correlation between state owned land surrounding towns and informal occupation of land.

State owned entities such as SANRAL, ESKOM, LEDA etc own various portions of land across the province. SANRAL has taken ownership of various regional road networks in the province and is in process to secure ownership of the road reserve areas.

From the above, is clear that the existing land tenure arrangement in the province continue to influence settlement patterns, both formal and informal.

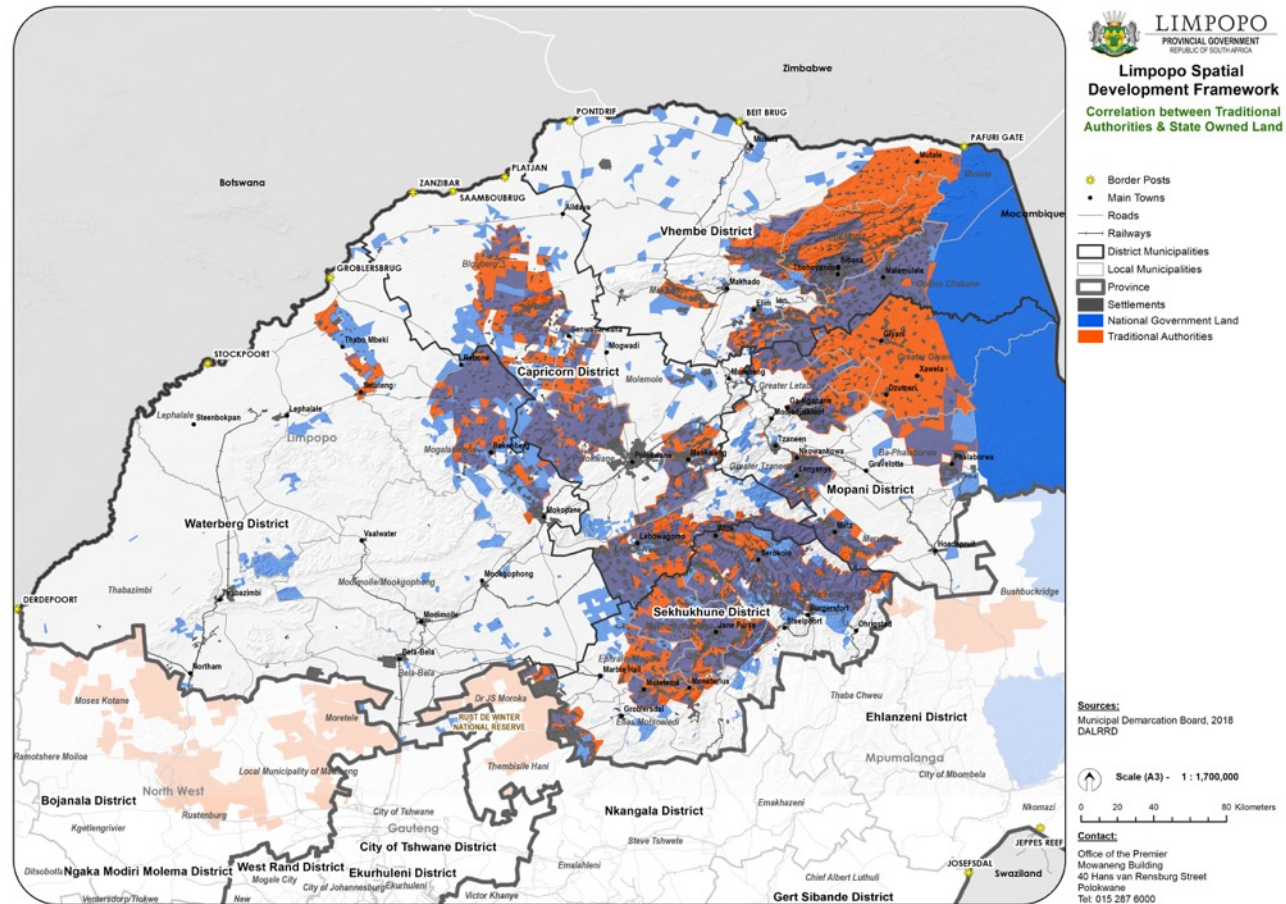


Figure 6: Correlation between state-owned land and areas under the custodianship of traditional authorities

4.1.3 Provincial land use structure

The spatial pattern of Limpopo is a physical manifestation of various form-giving processes and forces, of which economic forces such as production resources (minerals, agriculture, water) and political and cultural influences are the most dominant. The basic elements of a spatial pattern comprise nodes, networks and areas, which, in turn, are made up of macro land uses such as settlements, agricultural areas, mining areas (activities), conservation areas and transport networks.

4.1.3.1 Land cover and macro land use

The total land area of Limpopo is 125,806 km². The province has a primarily rural spatial character, as illustrated by the 2020 land cover in Figure 7.

Settlements

The provincial spatial structure in Figure 8 comprises a network of towns and villages, with the city of Polokwane as the provincial capital, located in the centre of the province. Polokwane is also the only secondary city in the province. The province is home to 2,684 settlements that range from large to medium-size formal towns, to small, scattered villages. The settlements cover a land area of approximately 483,394 ha, which represents 4% of the total land area of the province.

The N1 is the main north–south structuring element in the province, linking the city of Polokwane to Gauteng in the south and to Zimbabwe in the north. Apart from Polokwane, seven of the main towns in the province are situated along or close to this north–south corridor.

Four large population concentrations of small to medium-size villages are found in the north-western, central and eastern parts of the province, mainly on traditional or communally owned land.

The central concentration around Seshego and Mankweng comprises low-density villages with higher densities and mixed land uses around Seshego and the University of Limpopo and along the R71. This urban complex has been expanding significantly over the past five years with both residential and commercial uses along main roads.

The concentration in the north-eastern parts of the province (Vhembe and Mopani) also comprises large numbers of scattered small villages. The medium-size towns in this cluster with higher population densities are Thohoyandou, Malamulele, Giyani, Tzaneen, Nkowankowa and Lenyenye.

The concentration in the Sekhukhune district is another highly populated cluster of scattered villages served by the formal towns of Burgersfort, Jane Furse, Lebowakgomo, Groblersdal, Marble Hall and Steelpoort. It is evident that the population size of the settlements along the R37 is higher.

The north-western cluster of settlements can be regarded as the most marginalised, with highly dispersed and very small villages found north of Senwabarwana.

The settlement pattern north-west of Mokopane up to Bakenberg and Rebone has seen rapid expansion and occupation of land around mining operations on the Platreef, whilst continued low-density scattered settlements occur further north-west.

In stark contrast, the western parts of the province mostly comprise a range of small to medium-size towns such as Lephalale, Thabazimbi, Modimolle, Bela-Bela, Mokopane, Mookgophong and Vaalwater surrounded by commercial agriculture. A smaller clustering of sparsely populated settlements is located along the Palala River.

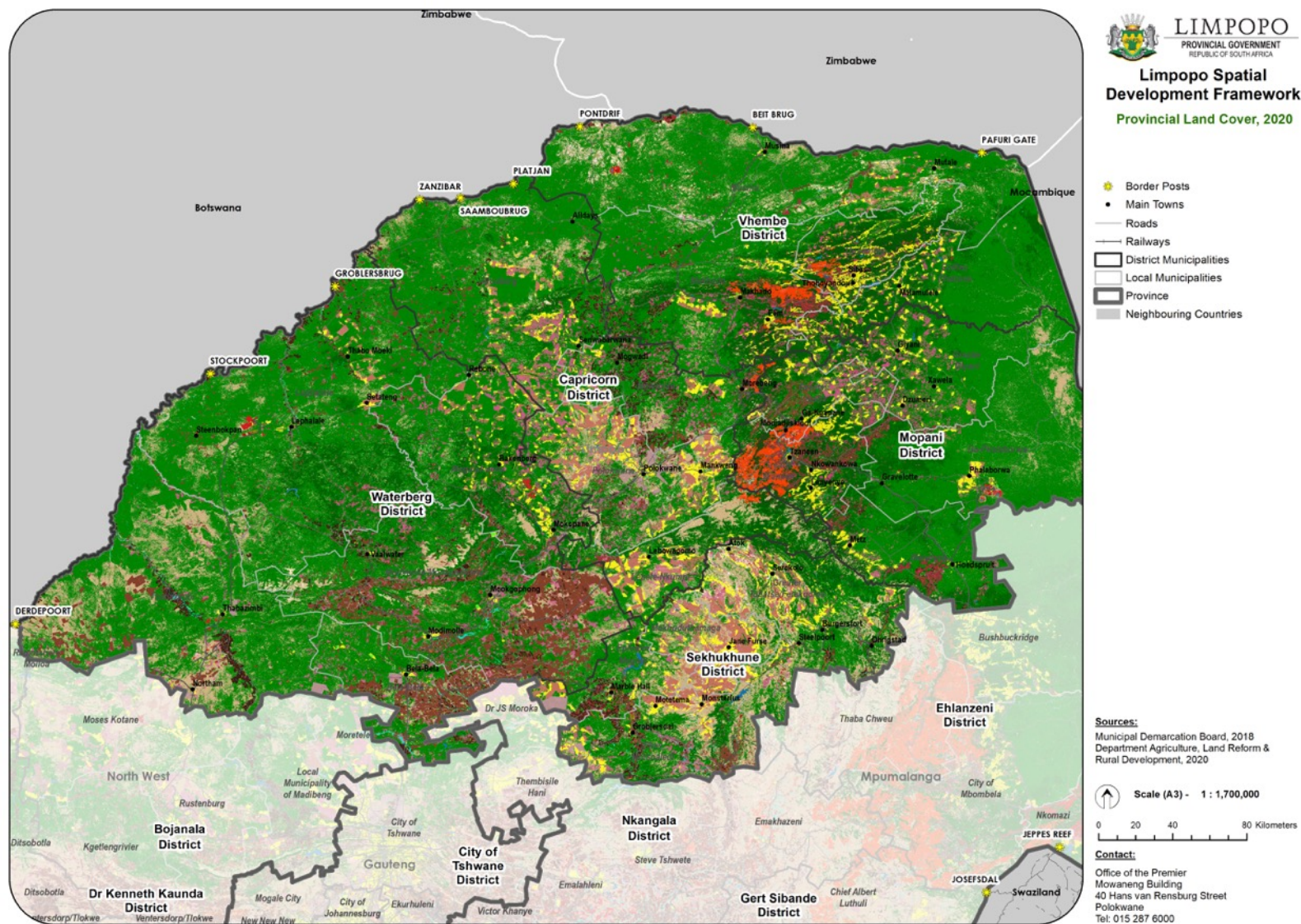






Figure 7: Provincial land cover 2020

Refer to legend in overleaf

Legend

	contiguous (indigenous) forest		eroded lands		residential informal (low veg / grass)
	contiguous low forest & thicket		sand dunes (terrestrial)		residential informal (bare)
	dense forest & woodland		coastal sand & dunes		village scattered (bare & low veg/ grass combo)
	open woodland		bare riverbed material		village dense (bare & low veg / grass combo)
	contiguous & dense plantation forest		other bare		smallholdings (tree)
	open & sparse plantation forest		cultivated commercial permanent orchards		smallholdings (bush)
	temporary unplanted (clear-felled) plantation forest		cultivated commercial permanent vines		smallholdings (low veg / grass)
	low shrubland (other)		cultivated commercial sugarcane pivot irrigated		smallholdings (bare)
	low shrubland (fynbos)		cultivated commercial permanent pineapples		urban recreational fields (tree)
	low shrubland (succulent karoo)		cultivated commercial sugarcane non-pivot		urban recreational fields (bush)
	low shrubland (nama karoo)		cultivated emerging farmer sugarcane non-pivot		urban recreational fields (grass)
	sparsely wooded grassland		commercial annual crops pivot irrigated		urban recreational fields (bare)
	natural grassland		commercial annual crops non-pivot irrigated		commercial
	natural rivers		commercial annual crops rain-fed / dryland		industrial
	natural estuaries & lagoons		subsistence / small-scale annual crops		roads & rails (major linear)
	natural ocean & coastal		fallow land & old fields (trees)		mines: surface infrastructure
	natural lakes		fallow land & old fields (bush)		mines: extraction pits, quarries
	natural pans (flooded @ observation times)		fallow land & old fields (grass)		mines: salt mines
	artificial dams (including canals)		fallow land & old fields (bare)		mine: tailings and resource dumps
	artificial sewage ponds		fallow land & old fields (low shrub)		land-fills
	artificial flooded mine pits		residential formal (tree)		fallow land & old fields (wetlands)
	herbaceous wetlands (currently mapped)		residential formal (bush)		
	herbaceous wetlands (previously mapped)		residential formal (low veg / grass)		
	mangrove wetlands		residential formal (bare)		
	natural rock surfaces		residential informal (tree)		
	dry pans		residential informal (bush)		

Conservation

Land used and protected for conservation use is found in abundance in the province through all the state- and privately owned conservation areas. The largest area used for this purpose is the Kruger National Park and the Mapungubwe National Park. Conservation uses cover approximately 21.5% of land in the province and are discussed in more detail in the chapter on the province's biophysical environment.

Agriculture

Agriculture is the land use that covers the largest land size in the province, namely 75%. The varied climatic regions found in the province allow for the production of a wide variety of agricultural produce, including tropical fruits such as banana and mangos, citrus fruits, blueberries, nuts (macadamia and pecan), avocados, cereals such as maize and wheat, and vegetables such as tomatoes, onion and potatoes.

Agricultural production is more prominent in certain parts of the province:

- Forestry is concentrated along the eastern parts of the Soutpansberg in Levubu and along the eastern escarpment of the Drakensberg in the region of Tzaneen and Modjadjiskloof.
- The Levubu region is also an important sub-tropical region where fruit and nuts are successfully produced and processed.
- The western part of the Mopani district is the so-called fruit basket of the province, with Tzaneen, the Letsitele Valley and Modjadjiskloof as central regions to the production and export of fruit, nut and vegetables.
- The south-western part of the Sekhukhune district around Groblersdal and Marble Hall is known for its vegetables and citrus, but has expanded towards the production of export fruit, especially grapes.

Despite the abundance of agricultural production in the province, according to the agricultural land capability, 50% of the province is moderately to highly

suitable for agricultural land uses (LDP, 2020). However, only about 9% is under cultivation, which emphasizes the potential of the land.

Livestock and small-scale subsistence farming are important contributors to sustainable livelihoods in the province and follow the settlement distribution pattern.

The province is also renowned for its game farming. Large parts of especially the western, northern and eastern parts of the provinces are licensed exempted game farms that support the tourism and game industry.

Mining

According to the Department of Mineral Resources and Energy's (DMRE) dataset of operating mines and quarries, Limpopo has 147 operating mines. Limpopo's rich mineral deposits include, amongst other things, over 50% of the country's untapped coal resources, platinum group metals (PGMs), iron ore, chromium high- and middle-grade coking coal, diamonds, antimony, phosphate and copper, as well as mineral reserves such as gold, emeralds, scheelite, magnetite, vermiculite, silicon and mica.

The spatial distribution of mining operations is indicated in the analysis of the socio-economic environment Section 3.4.2 and Figure 30 in the same section shows the clusters of mining activity:

- **Platinum mining clusters** are found at Mogalakwena, Northam/Amandelbult, and Burgersfort/ Steelpoort. These areas are major sources of chrome, vanadium and platinum.
 - The Platreef north of Mokopane has the largest open-pit platinum mine in South Africa (Mogalakwena Mine). The operations in this area are mainly open-cast mines due to the shallow reef. This makes the settlement invasion of the land such a high risk to the desterilisation of the mining potential. Significant investment is being made and planned in this mining area by various operations.
 - The Northam/Amandelbult mining region is a well-established mining area and a combination of open-cast and underground mines is operational in this area. This region has strong linkages to the Rustenburg or western limb of the Bushveld Igneous complex.

- Burgersfort/Steelpoort mining area comprises an almost linear pattern of mining operations along the R37. The operations mine mostly underground. Further south of Burgersfort, towards Steelpoort, open-cast mining operations are more evident, and a combination of platinum and chrome is mined. This area has the largest number of operational mines in Limpopo.
- The **coal and petrochemical cluster** is located at Lephalale and Steenbokpan. The area includes 50% of South Africa's coal resources with especially large deposits at the Tuli Coalfields (at the Pontdrif border post). The coal mining operations at Lephalale/Steenbokpan currently supplies the Medupi and Matimba power stations. The mines are mostly open-cast mines.
- The **Musina Makhado mining cluster (coal and diamonds)** is located north of the Soutpansberg at Alldays. Venetia Mine is the largest open-pit diamond mine in South Africa.
- The **Phalaborwa copper mining cluster** is located at Phalaborwa town. The largest vermiculite mine in the world is in this cluster as well as the largest copper mine in South Africa. The copper mine also operates a smelter and refinery complex.



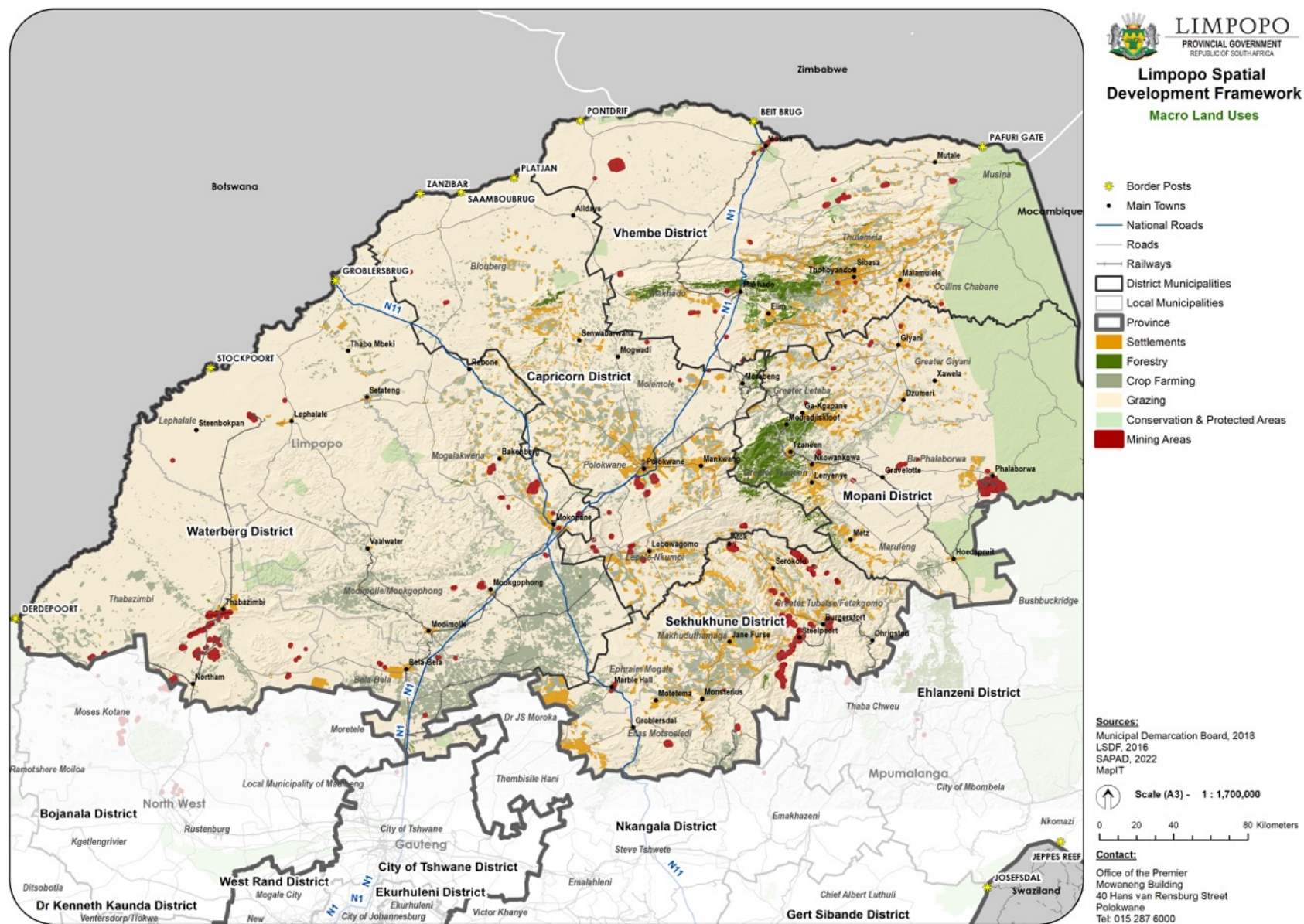


Figure 8: Provincial macro land uses

The spatial structure of Limpopo, similar to that of the rest of South Africa, is influenced by former apartheid legislation, which created a “dual planning and land ownership system”. The spatial structure and settlement patterns in the province are therefore influenced by the land ownership or tenure system, following an outcome of freehold ownership for citizens of the former “white areas” of South Africa and customary tenure or communal ownership for citizens in the former self-governing territories or homelands.

Another factor that influenced the settlement patterns is the settlement forms or types imbedded in the dual planning system. For the former republic parts, formal townships were established with individual ownership (title deed). On the other hand, settlements in the former homelands provided for a less formal township process and did not all include the registration of erven in the Deeds registry or the transfer of ownership in title, but permission to occupy certificates are issued to secure the informal right to use the land. This resulted in a specific pattern of compact settlements versus scattered low-density settlements.

Figure 9 is a simplified illustration to describe the relationship between land tenure or ownership system, the settlements forms associated with it, and the consequences of settlement patterns that developed in Limpopo.

The analysis of the different settlement forms and typologies and the spatial patterns that emerged in the province are discussed in the sections that follow.

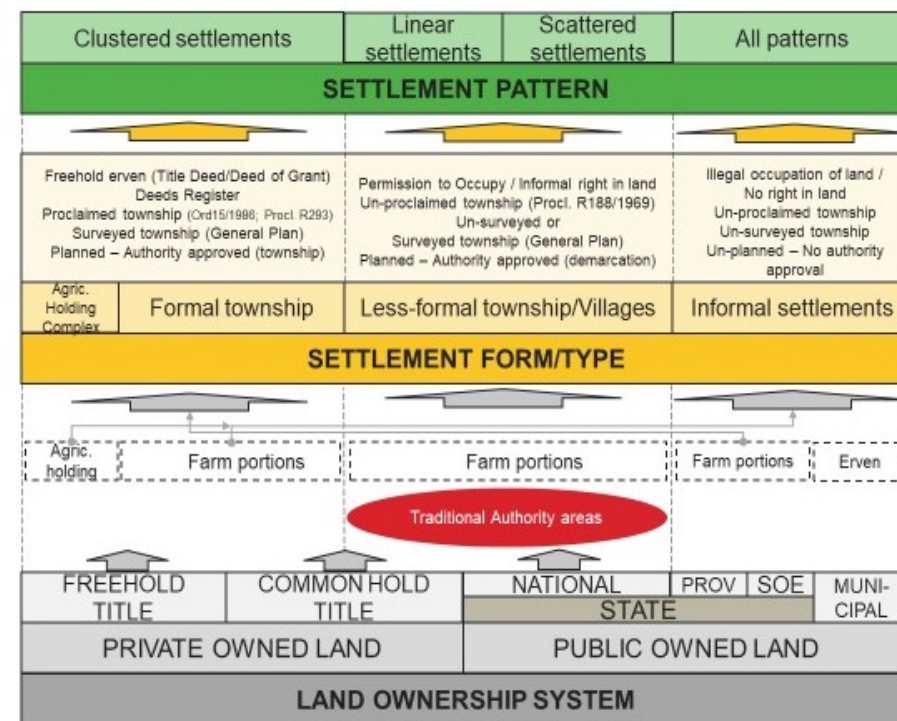






Figure 9: Schematic illustration of components of Limpopo's settlement structure

4.1.3.2 Settlement forms

Apart from agricultural land with farmsteads/lodges, the settlement forms found in the province are formal townships, less formal townships or villages, agricultural holdings complexes and informal settlements. The spatial distribution of the settlement forms, shown in Figure 10, illustrates the influence of historical legislation on settlement forms. The majority of the settlements in the province are classified as less formal townships or villages, which impacts on spatial governance, sustainable service delivery and property asset creation. The existing growth points in the LSDF hierarchy are mainly the township.

	<p>A township is defined in SPLUMA as an area of land divided into erven and may include public places and roads indicated as such on a general plan. Normally, townships are proclaimed in terms of law, whereby a township register is opened by the Deeds Office. Townships in Limpopo are formally established in terms of legislation such as the following:</p> <ul style="list-style-type: none"> ► Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013) ► Development Facilitation Act, 1995 (Act 67 of 1995) ► Less Formal Township Establishment Act, 1991 (Act 113 of 1991) ► Town Planning and Township Ordinance, 1986 (Ordinance 15 of 1986) ► Proclamation R293 of 1962 (Black Administration Act, 1927 (Act 38 of 1927)) ► Upgrading of Land Tenure Rights Act, 1991 (Act 112 of 1991) 	<p><i>Examples:</i> Polokwane Tzaneen Lephalale Musina Burgersfort Groblersdal Lebowakgomo Rebone Nkowankowa Namakgale Thohoyandou Northam, Thabo Mbeki</p>
	<p>A less formal township or village can be defined as an earmarked area for occupation by a community where permission was granted to a community or individuals to settle on state-owned or communally owned land. It includes settlements where people hold an informal right to land as contemplated in the Interim Protection of Informal Land Rights Act (IPILRA), 1996 (Act 31 of 1996). Occupancy is normally associated with a permission to occupy (PTO) or customary tenure right.</p> <p>In the case of Limpopo, certain settlements were planned under provisions of Proclamation R188 of 1969, read with the Self-governing Territories Constitution Act, 1971 (Act 21 of 1971). No general plan or township register was opened by the Deeds Office. In a few cases, there is a sketch plan or layout plan for a village, but in most instances, settlement took place in an unplanned manner.</p>	<p>Xawela Metz Gabaza Masodi Shongoane Setateng Dzumeri Semenya Driekop</p>
	<p>An “agricultural holding complex” is defined as an area where individual land portions have been surveyed and the portions are at least 8,565 m² in extent, whereas the use of such land is specified in their title deeds. Specific conditions, almost similar to conditions of establishment for townships, are registered against the title deeds of such property to determine the property's use and prevent its subdivision. Usually, agricultural holdings were established in terms of the Agricultural Holdings Act, 1919 (Act 22 of 1919).</p> <p>Although the original purpose of agricultural holdings was for exclusive use as a “farmstead” and for the purposes of agriculture or horticulture or for the keeping or breeding of domestic animals, poultry or bees, it is most often used only for residential or business purposes, thus representing a form of settlement located on the fringes of townships.</p>	<p>Dalmada Lushof Kromdraai</p>
	<p>An informal settlement is an unplanned settlement on land that has not been surveyed or proclaimed, where individuals have settled illegally and erected informal or formal structures without the consent of the landowner and/or without the necessary legal consent/approval by controlling authorities.</p>	<p>Smashblock Jacob Zuma Raphuti Skierlik</p>

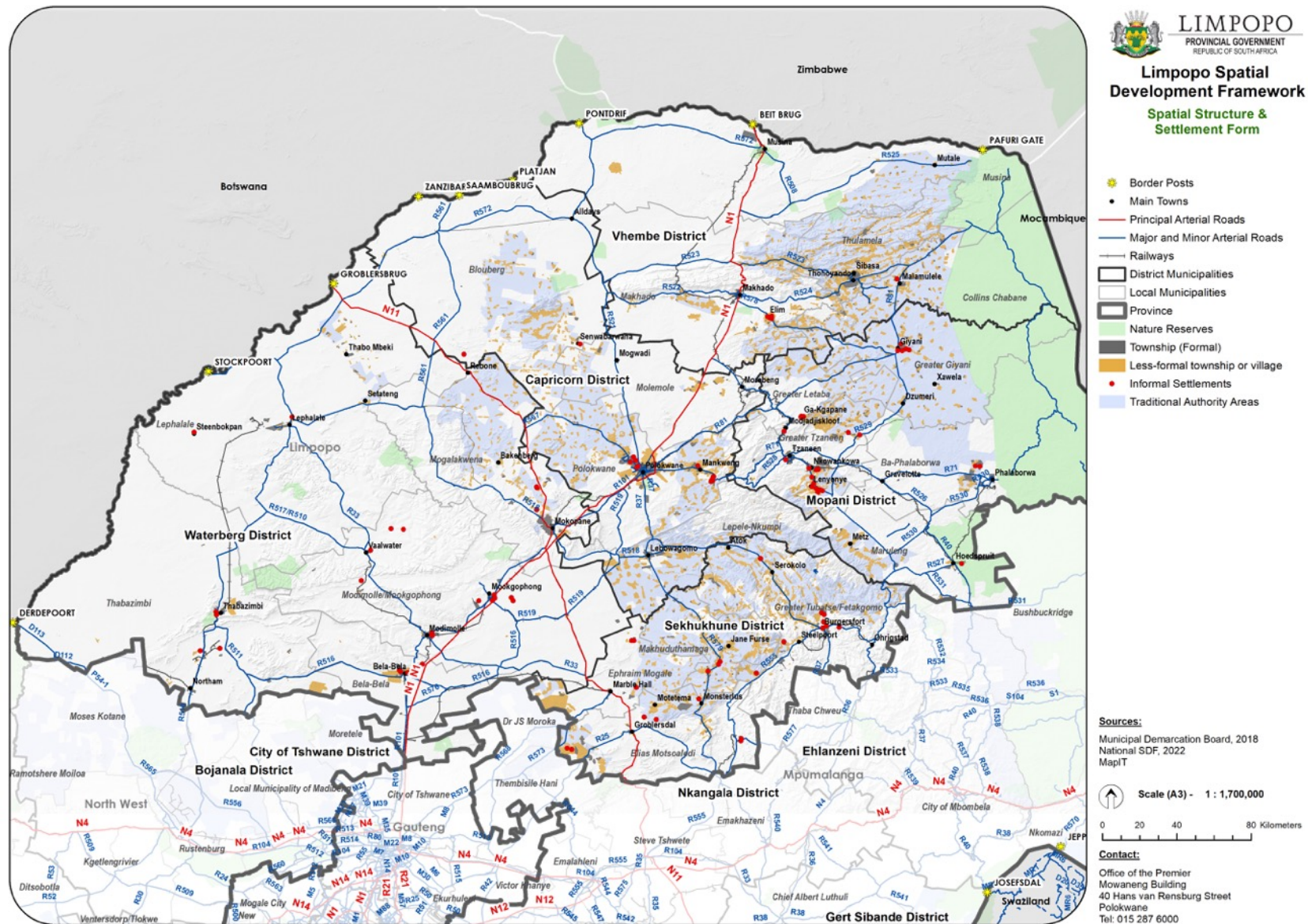


Figure 10: Settlement forms

4.1.3.3 Settlement types and patterns

The types of settlement patterns currently found in the province are clustered or nucleated settlements, linear settlements, and scattered or dispersed settlements. Those types of patterns are illustrated in Figure 11. The dominant type of settlement pattern in the Waterberg district is clustered settlements, whereas scattered settlement types are dominant in the central and eastern parts of the province.

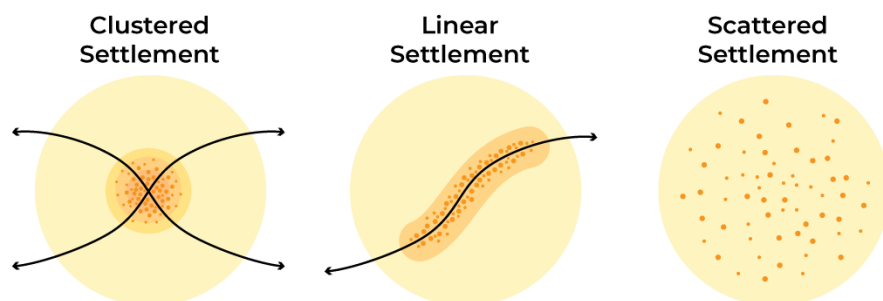


Figure 11: Settlement patterns categories

Clustered or nucleated settlements

The clustered settlements in the province are mainly formal townships originally established at the intersection of prominent national and provincial routes, and in areas with a strong economic base and central place function. The clustered settlements accommodate a large spectrum of community facilities and services such as government offices, shopping facilities and businesses, banks, medical facilities and consulting rooms. The facilities and services provide the opportunity for a large workforce to live relatively close to their places of work. These settlement types emerged mostly as higher-order nodal areas in the settlement hierarchy.

Examples of this clustered settlements are Polokwane, Bela-Bela, Mokopane, Makhado, Lebogakgomo, Mookgophong, Modimolle, Groblersdal, Thohoyandou, Musina and Tzaneen. These settlements' population sizes range between 15,000 and 30,000.

Scattered and linear settlements

Linear and scattered settlements are found mainly in the non-urban (rural) areas established on either state-owned or communally owned land.

Linear settlements are also more evident in areas under traditional authority, where settlements are formed along routes or rivers that provide access to transport or water sources.

Linear settlements are found in the Thohoyandou/ Sibasa area in the Vhembe district, along the main roads to Jane Furse and Burgersfort in the Sekhukhune district, and along the R71 from Polokwane to Mankweng and Badimong. Another linear settlement group is in Maruleng where the settlements around Metz establish along the escarpment and river.

Before 2016, most of the scattered rural settlements had a population size of 1,000 or less. The results of the Community Survey 2016 show that, although many of the rural villages still have fewer than 2,500 inhabitants, more villages have expanded to a population size of between 2,500 and 7,500. This trend can be attributed not only to natural population growth but also to the merging of smaller settlements to form a larger settlement. This trend is more evident in linear settlements along main roads, especially in the Sekhukhune, Vhembe and Mopani districts.

Rural settlement densification trends

Rural densification is a current development trend where communities develop middle- to high-income residential houses on state or tribal land that borders main towns or road corridors, even where there is no formal tenure security and where no community and municipal services are planned. This development trend is beginning to restructure spatial patterns as well as local economies in the province. The downside of the trend is that it results in an increase in the backlog of planning and service provision and increases daily commuting to the closest urban area while public transport and road infrastructure is not properly planned and upgraded to accommodate such densification. This specific trend occurs along the R71 between Polokwane and Mankweng, the R37 to Burgersfort, the R37 between Nkowankowa and Lenyenye, the R524 between Thohoyandou and Sibasa and the N11 north of Mokopane. Efforts from local authorities to upgrade the areas are

constrained by the continued fast pace of the development of vacant areas, the sizeable investments made in land and buildings, challenges in relocating residential and business investments that have established in undevelopable areas such as floodlines and geotechnically constrained areas, the high cost and complexity of relocation, the lack of alternative relocation land and complex stakeholder management aspects.

Rural densification trends in South Africa have not been researched adequately to inform future planning. The trend observed is that investment in housing in rural areas is an increasingly preferred option as opposed to investment in formal urban areas. The trend can be attributed to factors such as cultural and social cohesion, safety and affordability. Due to the increase in population in these areas, commercial activities are following the trend and an increase in both informal sector and formal business investments are evident. The demand for service provision to the areas are increasing. The risk attached to this trend is the lack of municipal revenue earned to service, sustain and manage the areas. Moreover, based on visual observations of housing investments made in the areas, households may not necessarily qualify as indigents to justify equitable share allocations. The impact on the financial sustainability of municipalities is yet to be researched.

4.1.3.4 Settlement densities

There are approximately 2,684 settlements in the province, covering an area of 483,394 ha. The settlement detail per district in Limpopo is depicted in Table 2.

Table 2: Limpopo settlement detail per district

Area	Total settlement area (ha)	% of total settlement area of province	Estimated number of settlements
Limpopo	483,394	100%	2,684
Capricorn	122,242	25.3%	643
Mopani	79,971	16.5%	382
Sekhukhune	120,231	24.9%	584
Vhembe	115,218	23.8%	830

Area	Total settlement area (ha)	% of total settlement area of province	Estimated number of settlements
Waterberg	45,733	9.5%	245

A settlement density analysis was undertaken of 2,598 settlements in the province – i.e. townships, less formal townships or villages and informal settlements (excluding agricultural occupations). The settlements excluded from the density analysis are “working towns” as classified by the CSIR’s settlement typology (CSIR, 2018) e.g. mine villages, holiday villages/resort etc., and townships that are non-residential such as Mankweng Hospital and the University of Limpopo.

Table 3 sets out a summary of the average residential density and erf (site) size for urban and rural settlements on district level and for Limpopo. (The breakdown for local municipalities is included in [Appendix B](#)). The nett density was calculated by subtracting 30% of land from the total area of a settlement, representing areas taken up by streets, open spaces and other land uses such as schools in the settlement.

In the analysis, the settlements’ nett densities were categorised as follows:

- Fewer than 5 units/ha: Very low density
- 5 to 20 units/ha: Low density
- 20 to 40 units/ha: Medium density
- 40 to 74 units/ha: High density
- 75 or more units/ha: Very high density

Provincial densities (overall)

The average nett density of settlements in Limpopo is only 4.79 dwelling units per hectare, with an average erf or stand size of 3,259 m². It is better

to consider the mode³ or ruling densities rather than the average, because the mode gives a more realistic density due to the informal nature of the majority of the settlements.

The differences in the densities of urban and rural settlements in the province are as follows:

- Urban settlements have an average density of 12.58 units/ha and an average erf size of 2,035 m². The ruling density is 8.8 units/ha.
- Rural settlements have an average density of 4.46 units/ha and an average stand size of 3,310 m². The ruling density is 4.7 units/ha.

Table 3: Average residential densities and erf sizes per district in Limpopo

Area	Total settlements		Urban settlements		Rural settlements	
	Average nett density (units/ha)	Average erf size (in m ²)	Average nett density (units/ha)	Average erf size (in m ²)	Average nett density (units/ha)	Average erf size (in m ²)
Limpopo	4.79	3,259	12.58	2,035	4.46	3,310
Capricorn	4.50	3,634	14.27	1,417	4.14	3,716
Mopani	5.53	2,409	9.17	2,248	5.32	2,418
Sekhukhune	4.03	3,914	14.70	1,802	3.76	3,967
Vhembe	4.38	3,176	10.33	3,025	4.29	3,179
Waterberg	7.64	2,317	13.43	2,027	6.58	2,371

Urban densities

The densities in urban areas or formal towns in the province vary between 1.98 and 22.66 units/ha. The municipality with the highest urban settlement density is Musina, where the density is 22.66 dwelling units/ha with an average erf size of 776 m².

The average urban density in the province is 12.58 units/ha. However, the **ruling density** (or mode) in urban areas is about **8.8 units/ha**, which is low overall for urban areas.

The smallest average erf size (420 m²) is in Makhuduthamaga and the largest (5,430 m²) in Maruleng.

Rural densities

The densities in rural areas or settlements in the province vary between 2.92 and 16.04 units/ha with an average rural density of 4.46 units/ha in the province.

The highest density (16.04 units/ha) is found in Modimolle-Mookgophong.

However, the **ruling density** in rural areas is about **4.7 units/ha**, which is very low overall.

The smallest average rural erf size (1,570 m²) is found in Thabazimbi and the largest (5,822 m²) in Blouberg.

Analysing provincial densities

The analysis confirms the overall very low settlement densities of both urban and rural areas in the province. If settlement expansion continues at the same low-density rate, especially in rural areas, emphasis will need to be placed on the optimal use of scarce resources such as land and the associated consequences of financial resources in respect of infrastructure investment, service delivery etc. Given the magnitude of the impact, intervention in future settlement densification will be required.

It is estimated that the number of households in the province will increase by 356,486 from 2021 to 2031 (for more information, refer to section 3.1.3 of the socio-economic analysis.) The number of households will increase by another 416,426 by 2041 and an additional 474,831 households by 2051. This brings the total growth in the number of households over a 30-year period to 1,247,742 households. High-level calculations were used based on the AAGR trend of households for the entire Limpopo from 2016 to 2021

³ The “mode” is the value that occurs most frequently in a set of data.

and 2021 to 2031, which indicates that the total AAGR of households decreases by an estimated 0.4% annually.

The current area covered by settlements is 483,394 ha.

Scenarios for future use of space (land) for residential purposes

The following scenarios are sketched for the province in terms of future settlement practices and densities:

Box 1: Scenario 1 – Business as usual approach

In this scenario, it is assumed that growth in the rural areas will continue at the rate of **4.7 units/ha** and in the urban areas at a rate of **8.8 units/ha**, with an assumption that the rural households represent 78% and the urban households 22% of the total number of households in the province.

Under this scenario, an additional area of **68,074 ha** of land will be required by 2031 (next 10 years) for settlement expansion and eaten into agricultural land.

This area is almost **70%** of the area currently occupied by settlements in the **Mopani** district, covering 79,971 ha.

After a **30-year period** (up to 2051), an estimated **additional 238,265 ha** of agricultural land will have to be released to provide for settlement growth. The land area covered by settlements will increase with $\pm 49\%$ to **721,660 ha**.

Box 2: Scenario 2 – Adaption approach

Scenario 2 assumes a slight increase in the urbanisation rate and that after 30 years, 25% of households will live in urban areas and 75% in the rural areas.

Densities is assumed to vary between **20 and 40 units/ha**, which will accommodate erven between 250 m² and 500 m² in size. The following further assumptions are also made:

- Rural areas will develop at densities of 20 units/ha on erven of 300 to 500 m²
- Urban areas will develop with 70% of household growth at densities of 20 units/ha (on erven of 500 m²) and 30% of household growth at density of 40 units/ha (on erven of 250 to 300 m²)

In this scenario, an **additional area of 17,236 ha** will be required by 2031 (next 10 years) for settlement expansion: 3,333 ha for urban and 13,902 ha for rural growth.

The additional land required is **22%** of the area currently occupied by settlements in the **Mopani** district (79,971 ha)

After a **30-year period** (by 2051), an **additional 60,174 ha** will be required for settlement growth, which means that the area covered by settlements in the province will increase by $\pm 12\%$ to a total area of **543,569 ha**.

In conclusion, at the current rate of low settlement density, the future impact on agricultural land as a scarce resource is enormous and calls for an intervention and policy directives.

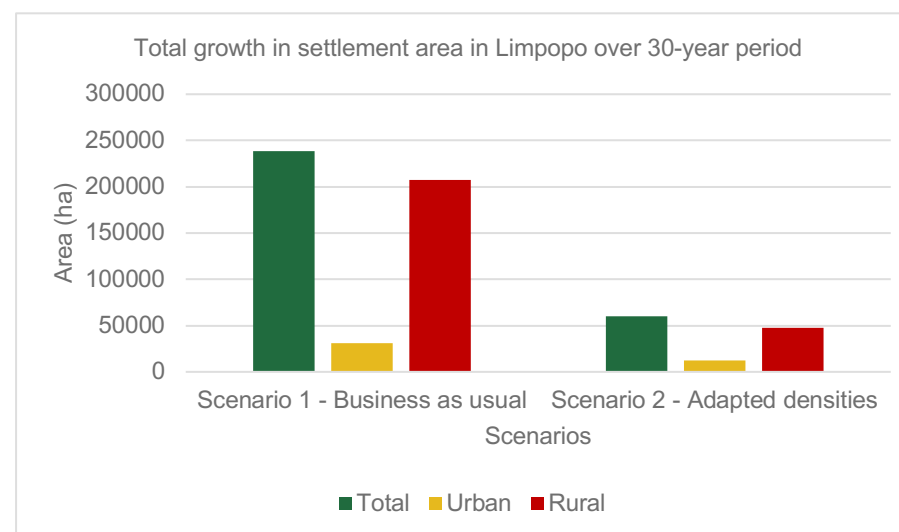


Figure 12: Comparison of density scenarios for future use of space (30 years)

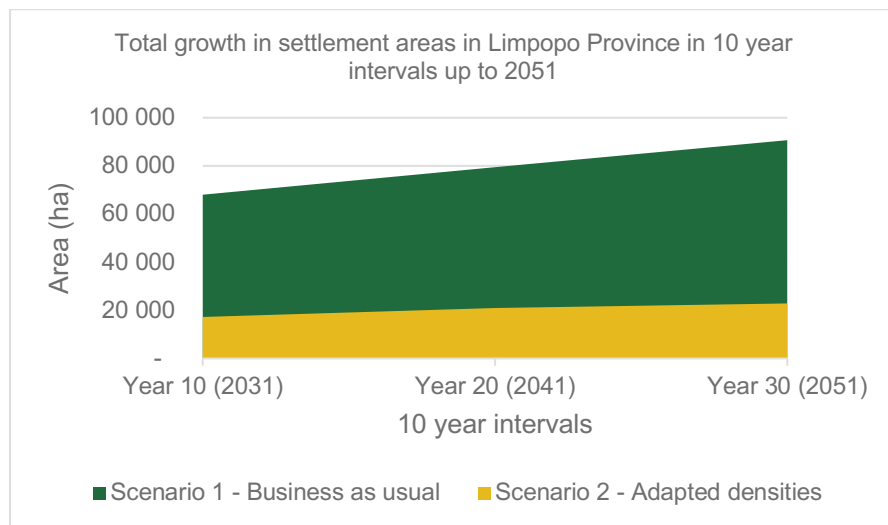


Figure 13: Comparison of two scenarios on densities for future use of space in 10-year intervals

4.1.4 Settlement pattern and trends per district

The focus of this section is on analysing the settlement patterns and growth trends for the individual districts in the province.

In the section on the province's socio-economic environment, population and household growth patterns were analysed and pockets of higher-density settlement growth in the province were shown on a heat map. The growth trends also indicated that the average annual growth rate (AAGR) of households in Limpopo between 2016 and 2021 was 1.9% or 161,798 households. In this section, that rate is used as the norm to establish which districts and areas have a household growth rate that is higher than the provincial average. The actual household growth in numbers is also taken into account.

4.1.4.1 Capricorn district

The structure of the Capricorn district is formed by the city of Polokwane as a strong clustered settlement with radial roads from the region leading to it. It is not only the capital of the province but also the administrative and commercial centre of the province. Polokwane is currently the only city in the province and is classified as a secondary or intermediate city, aspiring to achieve metro status.

The spatial pattern of the district comprises four concentrations of scattered rural settlements of low-density and small-scale farming practices around the settlements. Within these concentrations are the formal towns (clustered settlements) of Lebowakgomo, Mankweng and Morebeng, where economic activity is concentrated. Lebowakgomo is the home of the Provincial Legislature.

Alldays, located in the northern part of the district, functions as a service centre to the surrounding agricultural region and diamond mining operation.

Between 2016 and 2021, the Capricorn district had an average annual household growth rate of 1.9%, or 38,474 households, which is equal to the provincial average. Figure 14 illustrates the expansion of settlement footprints (in dark red) evident across almost all settlements but with higher concentrations around Polokwane, Mankweng, Senwabarwana and Lebowakgomo. Informal settlements are also at these nodes.

The local municipality that contributed most to the household growth rate is Blouberg, which had a growth rate of 2.6%, or 7,923 households, over the same period. The settlement growth was highest at Senwabarwana. The previously small scattered settlements northwest of Senwabarwana and south of the forestry area have developed into larger linear settlements. A new settlement was established north of the forestry area.

The Polokwane and Molemole municipalities had a household growth rate of 1.8%, just below the provincial average. It amounts to 19,948 households for Polokwane and 3,588 for Molemole.

Spatially, the settlement growth in the Polokwane municipality took place at higher concentrations in the city of Polokwane, Mankweng, Seshego,

Perskebult/Blood River in the Polokwane cluster, Ga-Thoka in the Mankweng cluster, as well as the Seaka View settlement along the R71 between Polokwane and Mankweng.

In Molemole, the settlement expansion is more evident at the Ramakgopa and Makgato settlements along the N1 towards Makhado.

Although Lepelle-Nkumpi had a household growth rate of 1.7%, the increase in households was over 7,000. Spatially, the settlement growth was more prominent at Makotse and Motantanyane in the Lebowakgomo area and the Mehlareng and Lenting/Marulaneng rural settlements.

The average daily traffic (ADT) volumes shown on the map are a further indication of linkages between areas in the district. They also correlate with the areas identified to have experienced higher settlement growth. The highest ADT is between Polokwane and the Mankweng cluster, where the daily traffic exceeds 10,000. The average daily traffic volumes between the city of Polokwane and Lebowakgomo (R37), Matlala area and up to GaSemenya (R521) range between 3,000 and 5,000. The public transport corridors align with the roads with the highest ADT, except in the case of the Matlala road.

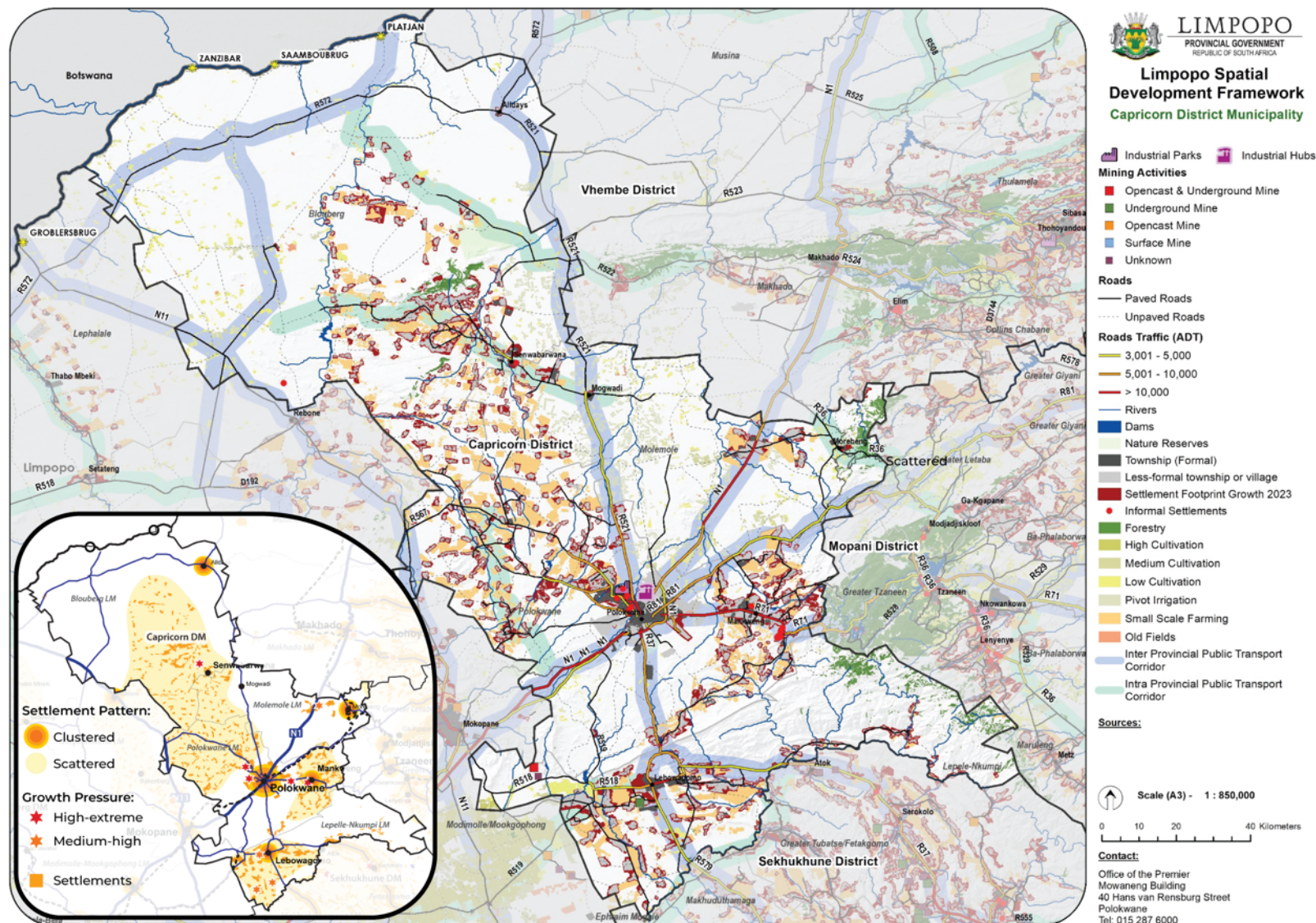


Figure 14: Settlement pattern and trends in Capricorn

4.1.4.2 Mopani district

The settlement form of the Mopani district is influenced by the topography of the area, the high agricultural potential of the area, the occurrence of copper at Phalaborwa and historical planning. Tzaneen is the dominant economic centre in the region and is identified in the NSDF, 2022 as a national urban node with potential to grow into a city in the eastern escarpment national spatial transformation and economic transition region.

The settlements are spatially established along the western parts of the district, while the central extents are fairly sparsely inhabited. Commercial agriculture and conservation areas (Kruger National Park) are the main land uses in the central and eastern parts of the district.

Clustered settlements or formal towns are the economic core of the settlement clusters and include Nkowankowa/Lenyenye, Phalaborwa and Namakgale/Lulekani, Giyani and Ga-Kgapane. In addition, the medium-size formal towns of Modjadjiskloof, Letsitele, Hoedspruit and Gravelotte serve a local service function linked to the agriculture or mining sector in the region.

The largest conglomerate of scattered settlements is found in and around Giyani, Modjadjiskloof and Ga-Kgapane on communally owned land that extends into the Vhembe population concentration.

From Nkowankowa/Lenyenye, a corridor of settlements is found along the south-western border (running parallel to the Drakensberg escarpment and R36), with a further linear settlement formation from Metz to The Oaks.

Between 2016 and 2021, the Mopani district had an average annual household growth rate of 1.7%, or an increase of 29,578 households.

In Figure 15, the settlement growth shows a pattern of scattered settlements expanding and merging to form larger consolidated settlements. The almost infill development that emerged in this district is found around the economic nodes of Nkowankowa/Lenyenye, Ga-Kgapane, Giyani, Namakgale/Lulekani and Metz.

The highest average daily traffic (ADT) counts of more than 10,000 vehicles per day are between Tzaneen and Nkowankowa/Lenyenye, and between Phalaborwa and Namakgale/Lulekani. The traffic patterns confirm the linkages between the urban cores and the settlement clusters surrounding the nodes.

The Maruleng municipality had a household growth rate of 2.4%, or 3,921 households. Percentage wise, this growth rate was the highest in the district and was higher than the provincial average, noting that the growth is from a small base. Most of the growth occurred in the linear settlement form along the Drakenberg escarpment in the Oaks and Metz area. There was also expansion in Hoedspruit as a clustered settlement and service node in the wildlife and tourism industry.

The Ba-Phalaborwa municipality had a household growth rate of 2.1%, or 5,243 households, over the period. That rate is higher than the provincial average. Most of the growth occurred in the areas of Namakgale and Lukekani to the west of the town Phalaborwa. It includes settlements such as Mashishimale-R3, Ben A, B and C, Humulani and Vuyelani, as shown in Figure 15.

Other areas that experienced higher concentrations of settlement growth are found in the Giyani area, in particular at Xikukwani north of Giyani. Linear growth patterns are evident along the R81 from Mooketsi to Giyani in settlements such as Sefofotse and Nwamankena West, and along the route from Ga-Kgapane to the R529 near Dzumeri. These areas are located in the municipal areas of the Greater Giyani and Greater Letaba municipalities, which respectively grew by 1.9% and 1.3%, or 7,352 and 4,208 households, on average between 2016 and 2021.

In the case of the Tzaneen municipality, which had a household growth rate of 1.5%, the Nkowankowa/Lenyenye settlements south-east of Tzaneen, including Maselapata and Mohlabe-X, showed the highest settlement growth. The growth in the Nkowankowa and Lenyenye areas also represents linear settlement patterns along the higher-order R71 and R36 provincial routes leading into Tzaneen.

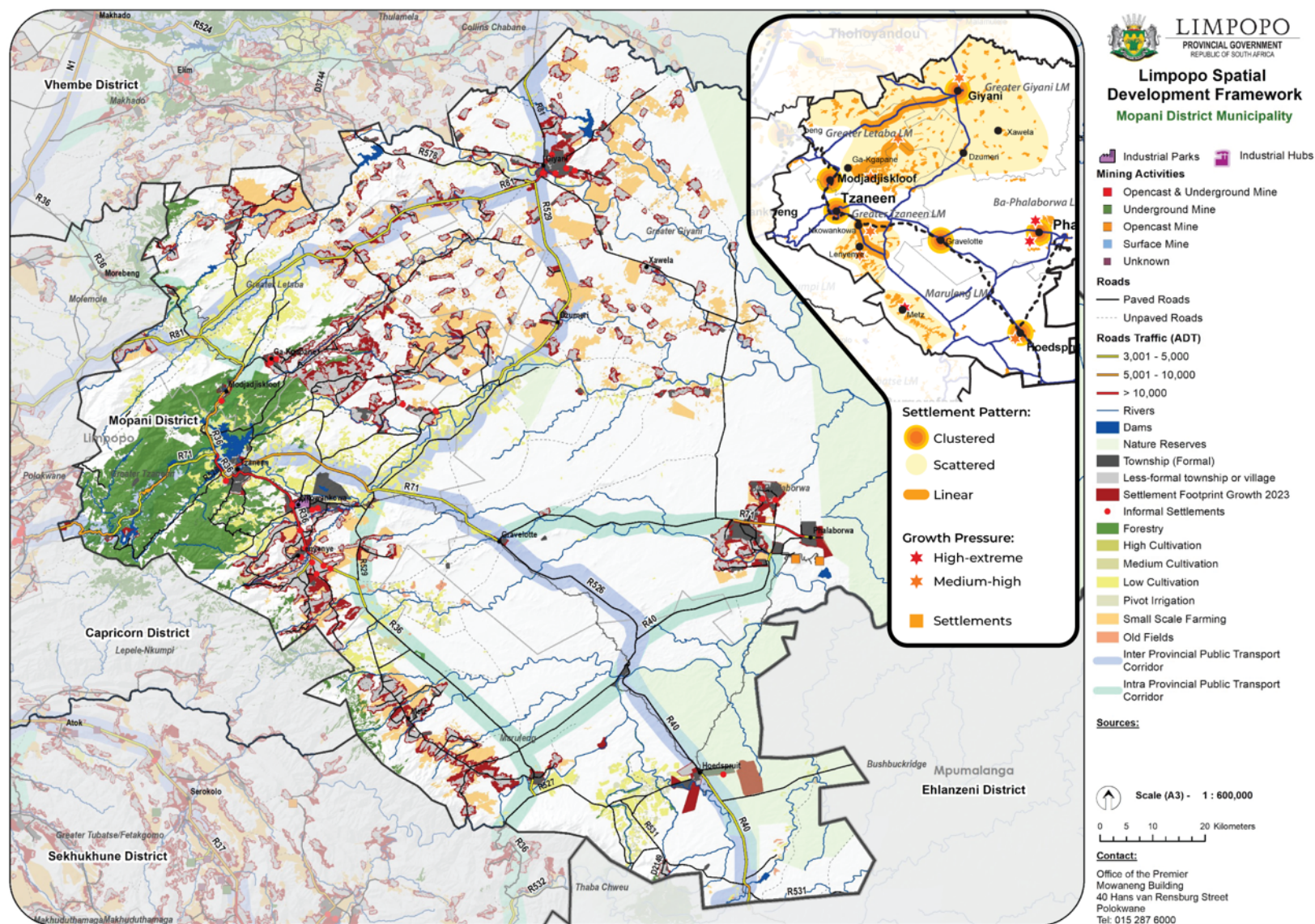


Figure 15: Settlement pattern and trends in Mopani

4.1.4.3 Sekhukhune district

Groblersdal along the N11 in the southern parts of the Sekhukhune district is the largest urban centre in the region, supported by Burgersfort, Jane Furse, Steelpoort, Ohrigstad and Marble Hall, all categorised as cluster type settlements.

The majority of the remainder of the district comprises a range of small and medium-sized linear and scattered settlements. A consolidation of linear settlements is evident at intersections along the higher-order road network and rivers, as illustrated in Figure 16. Scattered informal settlements tend to occupy land along main roads. The scattered settlements are also an extension of the settlement concentration from the Lebowakgomo area.

The platinum belt stretches along the R37 and various underground mining operations are active. South of Steelpoort, a continuation of platinum and chrome operations occurs. Individual settlements in the vicinity show large extensions such as Kalkfontein.

For this district, the average annual household growth rate for 2016 to 2021 was 2.2%, or an increase of 38,571 households, the highest of all the districts, and much higher than the provincial average of 1.9%. This emphasises the development pressure this area is experiencing, especially between Driekop and Burgersfort, Jane Furse, Monsterlus, Groblersdal, Dennilton/Elandsdoorn and the central parts of the district. Interestingly, the average daily traffic counts show high traffic volumes between Jane Furse and these nodes, in particular to Monsterlus, Groblersdal and Lebowakgomo.

In the Fetakgomo Tubatse municipality, the growth was mainly northwards along the R37 as well as towards settlements such as Alverton, Praktiseer and Bothashoek, including the linear development of Batau and Mandela west of Burgersfort. In the Schoonoord area, significant extension to the settlements of Ga-Mogashoa and Senkgapudi are observed. The average daily traffic counts were also the highest between Driekop and Burgersfort.

The western parts of the municipality in the Apél-Mohlaletse area showed larger settlement growth in settlements such as Mohlaletse Extension (Sekateng), Ga-Nkwana, Ga-Nchabeleng and Lerajana.

A larger expansion of settlements is evident in the Makhuduthamaga municipality, especially around Jane Furse and areas such as Mogolapong, Polaseng, Mogonwane, Sekwati and Riverside.

In the Monsterlus areas, and along the R579 between Lebowakgomo and Sehlakwane, settlements such as Sebetha and Takataka in the Makhuduthamaga municipality and Makaepa and Mogaung in the Elias Motsoaledi municipality experienced some expansion.

This widespread development correlates with the average annual growth rate between 2016 and 2021, where the Fetakgomo Tubatse municipality experienced household growth at a rate of 2.5%, or 17,486 households, which is much higher than the provincial average, and the Makhuduthamaga municipality at a rate of 2.6%, or 11,497 households. A main trigger for growth in this area is the rise in mining, industrial and commercial activities along the R37 and R555.

The Ephraim Mogale municipality's household growth rate was 1.7%, or 3,250 households, while the rate for Elias Motsoaledi was 1.5%, or 6,338 households.

It can be concluded that most of the growth, if not all of it, occurred in the rural areas in this district.

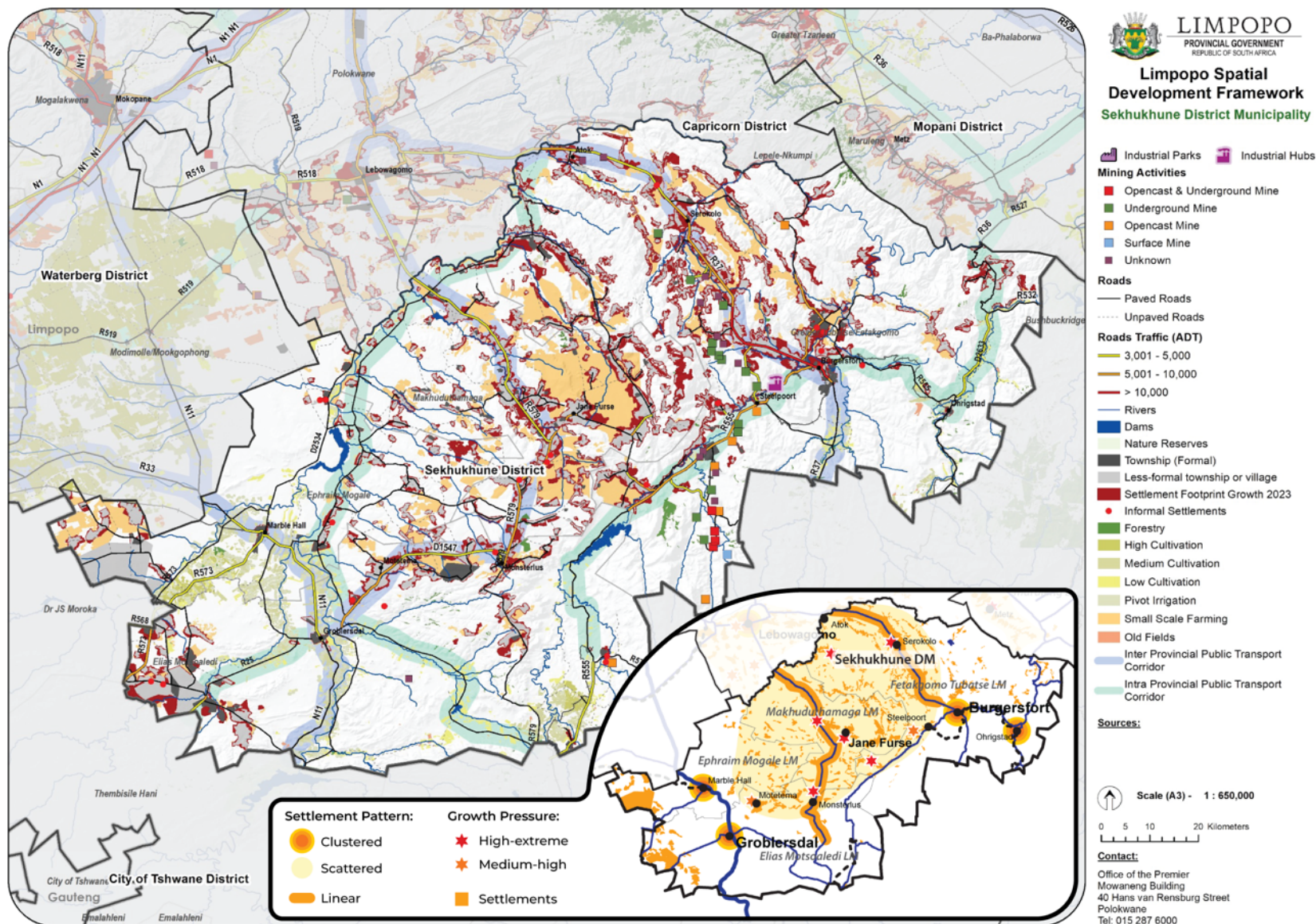


Figure 16: Settlement pattern and trends in Sekhukhune

4.1.4.4 Vhembe district

Thohoyandou is the service centre of the Vhembe district and is home to the University of Venda. Makhado and Musina are regional service centres established along the N1 north towards Zimbabwe. The MMSEZ is planned in the corridor formed between Makhado and Musina.

The northern and western parts of the Vhembe district are developed at a fairly low intensity and include the Mapungubwe transfrontier park. The Venetia diamond mine is also located north-east of Alldays. Makhado is the main clustered town west of the N1 at the foothills of the Soutpansberg mountains. The eastern extents of the district form part of the Kruger National Park and the Kruger to Canyons Biosphere.

The south-eastern extents, on the other hand, include a large concentration of scattered and linear rural villages around Thohoyandou, Sibasa, Malamulele and Elim. These settlements are a further continuation of the settlement pattern found in Greater Letaba and Giyani. It is also observed that the settlements are less scattered in the central parts of the area and those further north and far east are highly dispersed. Small-scale farming practices are more prominent in these highly dispersed settlements. The Levubu area is a rich agricultural area with sub-tropical fruits and nuts, and forestry plantations.

There is a strong correlation between the higher-order road network that traverses the district and the location of larger villages and towns, as shown in Figure 17.

The average annual household growth rate of the Vhembe district for the period 2016 to 2021 was 1.7%, or an increase of 33,121 households, which is lower than the provincial average of 1.9%.

The Musina municipality recorded an average household growth rate of 3.2% for the period 2016 to 2021, the highest rate in the province. That figure represents 4,756 households across the municipality. Figure 17 shows that the settlements of Masisi Village, Mutale, Matshakatini and a settlement (name unknown) north of Folovhodwe experienced higher expansion than the other areas.

For the period 2016 to 2021, the Collins Chabane, Makhado and Thulamela municipalities experienced average annual household growth rates of 1.9%, 1.6% and 1.3%, or 10,271 households, 9,203 and 8,892 households, respectively.

The municipalities of Makhado, Thulamela and Collins Chabane experienced higher than provincial average household growth between 2015 and 2020. Although the household growth is evident throughout the district, higher concentrations of settlement expansions are found along the R524 and include Vuwani, Vyeboom East, Tshingwa, Tshikweta, Makhuvha, Malamulele, Roodhuis and several more linear settlements towards the Kruger National Park.

A similar trend is observed where settlements seem to have larger footprint expansions along routes such as the R523 at Tshikuwi at the N1 up to Thohoyandou, the R524 between Makhado and Thohoyandou, and along the R578 from Elim to Ka-Nwamatatani.

The R524 carries the highest traffic volumes in the district according to the average daily traffic (ADT) for the road section around Thohoyandou. This emphasises the service function that Thohoyandou performs in the district. The scattered settlements around Mutale seem to have weak access to development opportunities due to their dispersed location and limited access to paved roads to areas service areas such as Thohoyandou.

Scattered settlement growth west of Makhado at Madombidza and Ravele is also observed.

It can be concluded that most of the growth in this district was in the rural areas, specifically along major routes.

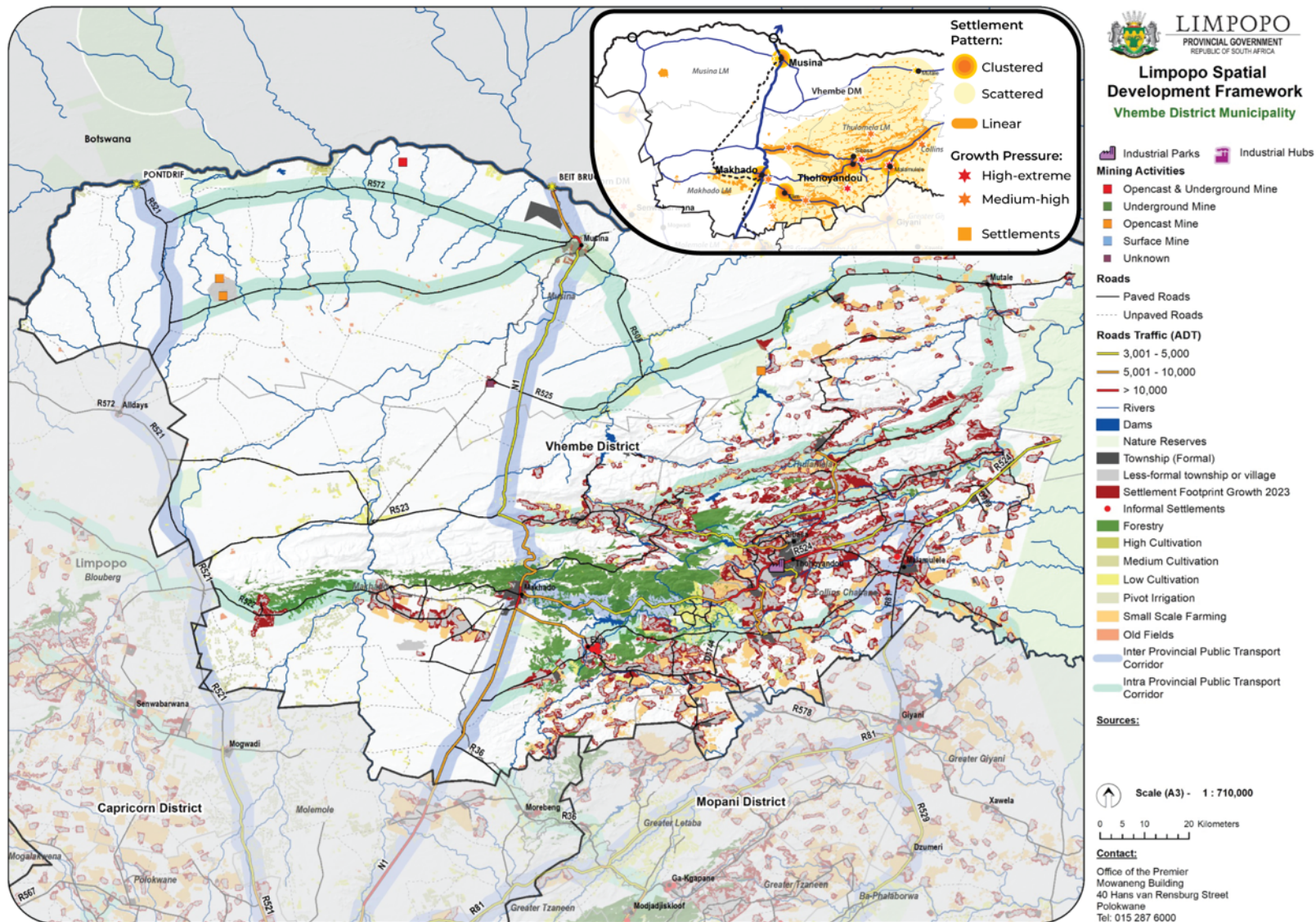


Figure 17: Settlement pattern and growth in Vhembe

4.1.4.5 Waterberg district

Geographically speaking, the Waterberg district is the largest district in the province, with less state land and land under the custodianship of traditional authorities. It is also the district with the most dominant pattern of clustered settlements, including towns such as Bela-Bela, Lephalale, Thabazimbi, Modimolle, Mookgophong and Mokopane, all located along main routes such as the N1 north–south corridor and the R510. The towns along the N1 are centres that serve large rural farming areas, as shown in Figure 18. However, the establishment of Lephalale, Thabazimbi and Northam has been influenced by the mining and energy industries. Consequently, these municipalities are prioritised under the revitalisation of distressed mining communities' programme. The occurrence of mining activity at these towns is indicated in Figure 18.

There is a large concentration of small, scattered settlements north-west of Mokopane, along the N11, with Bakenberg and Rebone as the main formal towns. This area is also known as the Platreef resource and the occurrence of mainly open-cast platinum mining activity is evident, as well as informal occupation of land surrounding the mines. The N11 between Mokopane and Masodi has the highest average daily traffic counts at more than 10,000.

The average annual household growth rate for the Waterberg district between 2016 and 2021 equals the provincial growth rate of 1.9%. The only municipality with a household growth rate higher than the average was the Lephalale municipality, with a rate of 3%, or 6,242 households. Based on the actual residential structure patterns, the area in Lephalale, where the settlement growth was most significant, is Setateng in the rural areas east of the town.

The Modimolle-Mookgophong municipality showed high growth mostly in residential structures concentrated around the N1. However, its growth rate was only 1.8%, or 3,267 households. The same applies to the Mogalakwena municipality, where there was much growth north-west of Mokopane and in the rural areas in settlements such as Marulaneng, Ga-Molekane, Ga-Magongoa, Madiba, Mholotlo and Ga-Sekhaolelo. However, its growth rate was 1.7%, or 8,672 households.

The Thabazimbi and Bela-Bela municipalities showed average household growth rate below the provincial average. However, the growth recorded for Thabazimbi was specifically concentrated around Northam and Raphuti.

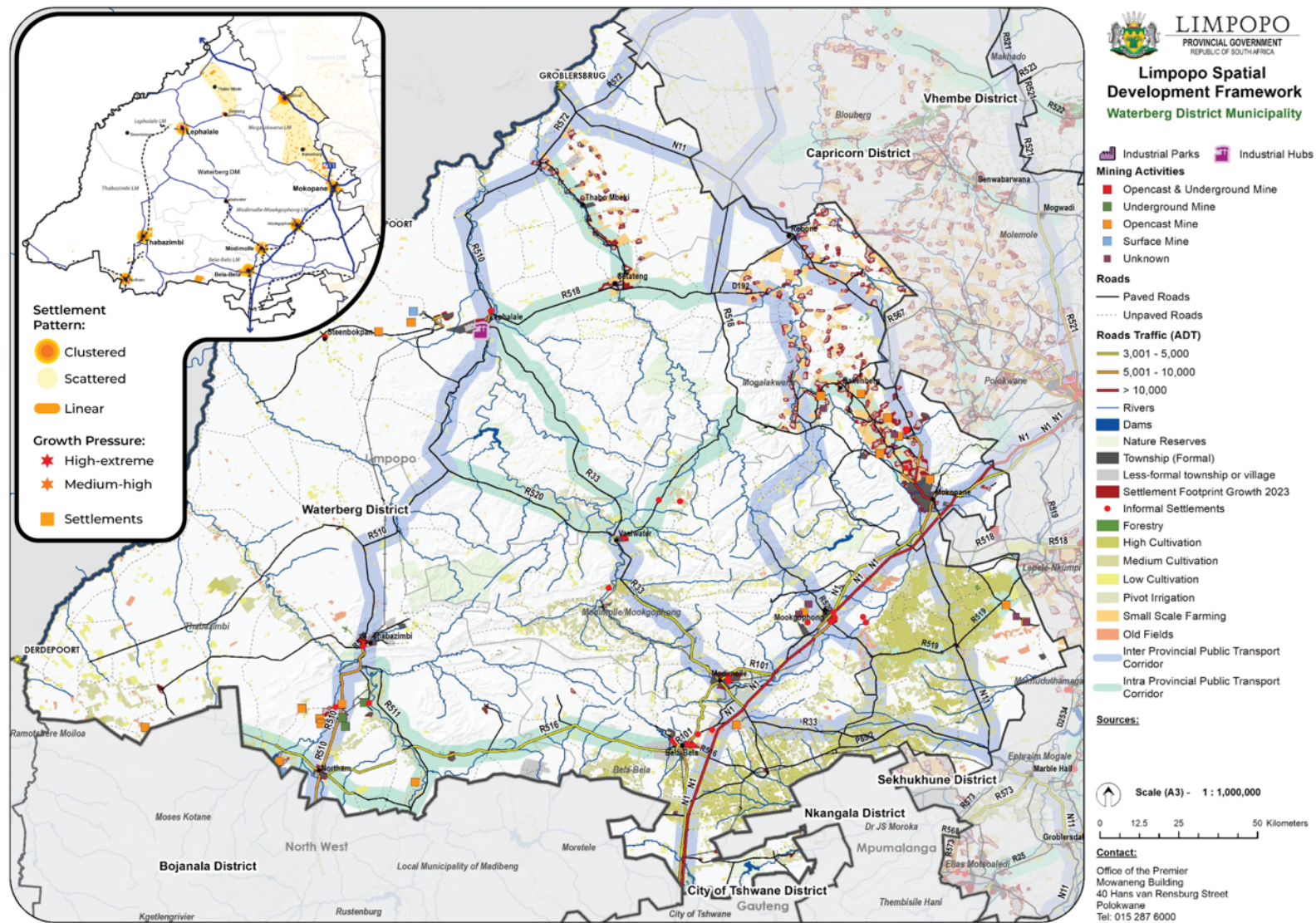


Figure 18: Settlement pattern and trends in Waterberg

4.1.4.6 Impact of COVID-19 pandemic and Fourth Industrial Revolution on settlement patterns

In an article in *The Guardian* (The Guardian, 2020) in the United Kingdom, the following is stated: “The pandemic has changed working patterns for good, a survey from the British Council for Offices (BCO) has found. In future white-collar workers will adopt a mixed approach, combining remote working with several days a week in the office.”

It is also stated in the article that such a mixed approach does not work for all companies and persons, especially where learning and development networks are important. Aspects such as productivity are also under consideration.

The trend towards working from home is driven by technology and the Fourth Industrial Revolution, where improved communication systems mean that parties can communicate online rather than face to face, can work online, etc. There are indications that the need for offices in central business districts and other office parks around the world may gradually decrease, which will impact on settlement patterns as well.

COVID-19 has changed not only office working trends but also many aspects of human behaviour, which will eventually affect settlement and movement patterns. The following are examples of changes in behaviour:

- Retail and shopping, where online shopping and delivery services replace or provide alternatives to conventional shopping. This gave rise to a need for warehousing and alternative delivery services.
- Education, where online training can reduce the necessity for classroom education, especially at tertiary educational institutions.
- There are also indications that areas with quality living environments, such as small towns or villages, tend to attract people who continue to work from home if they have access to adequate ICT networks.
- High commuting patterns are evident across the province. During the lockdown period, a definite change in commuting behaviour took place. Commuters mostly returned to their homes or house of origin. An increase in home improvements was experienced, and that boosted the

building sector. A decline in travelling was observed. Since the return to normal, the commuting patterns have picked up again, but the degree of change has not been quantified or researched sufficiently to inform future spatial planning.

4.1.5 Hierarchy of settlement/nodes

In the previous phase, the following was indicated with regards to the hierarchy of settlements or nodes in Limpopo:

[T]he hierarchy of some towns is higher at a provincial scale than what their role is considered [to be] at a national scale. The definitions applied in the two planning frameworks should also be compared to ensure meaningful comparison. Clearly, the review of the LSDF should reconsider the selected towns forming its nodal hierarchy taking into account the NSDF proposals. In addition, the application of the LSDF nodal hierarchy in municipal SDFs should also be taken into consideration.

(Section 4.3 of the Phase 1 report dated 1 December 2022)

In response to the above, the settlement hierarchy for Limpopo was evaluated to determine which nodes or settlements play, or should play, a prominent role in the province and the respective regions.

4.1.5.1 Evaluation of nodes

The evaluation of the settlement hierarchy applied a multi-criteria analysis approach. The following multi-criteria were applied:

- Current hierarchical ranking in the LSDF 2016
- Current hierarchical ranking in the NSDF 2022
- Current hierarchical ranking in regional, district or local municipal SDFs
- LDP, 2020-2025 nodal strategy prioritisation and investment
- Classification in terms of the CSIR's classification of settlement typology
- Household growth pressure

- Connectivity of settlements in terms of national and provincial corridors, priorities and proposals
- Proposed national and provincial spatial targeting criteria with regard to spatial transformation, human settlements, mining and freight, industrial, agriculture and rural development

Each criterion was weighted according to the anticipated significance of each settlement. The scoring criteria and weights that were used for the evaluation are indicated in Table 4.

Table 4: Scoring method for the evaluation of the settlement hierarchy and role in Limpopo

Criterion	Maximum weight	Sub-criteria and weights				
LSDF nodal hierarchy ranking	30%	30%	24%	18%	9%	0% Other
		Provincial growth point	District growth point	Municipal growth point	Rural node/service point	
NSDF nodal hierarchy ranking	15%	15%	12%		9%	
		National urban node	Regional development anchor		Rural service centre	
Regional, district or local SDF nodal hierarchy ranking	20%	20%	16%	12%	6%	
		Provincial growth point/first order	District growth point/second order	Municipal growth point/third order	Rural node/service point	
LDP prioritisation and economic investment	5%	5%		3%		
		Five re-prioritised nodes		Investment area		
CSIR settlement typology	6%	6%	5%	3%		
		City/large regional centre	Regional service centre	Service towns/rural service settlements		
Growth pressure	5%	5%	3%	1.5%		
		Extreme growth pressure	High growth pressure	Moderate growth pressure		
Connectivity	3%	3%		1.5%		
		Development corridor in NSDF		Provincial strategic route		
Spatial targeting: (16%):						
Spatial transformation	5%	5%		2.5%		
		NSDF Economic Transition and Transformation Region		IUDF Intermediate City Municipalities Programme		
Human settlements	3.5%			3.5%		
				Priority human settlements and housing development area (PHSHDA)		
Mining and freight	2.5%			2.5%	1%	
				Revitalisation of distressed mining communities municipality	Freight/logistics hubs, etc.	
Industrial	3.5%	3.5%		1.5%	0.5%	
		Promulgated Special Economic Zone (SEZ)		Industrial hub or other industrial initiative	Proposed SEZ	
Agriculture and rural development	2.5%		2.5%	1.5%	1%	
			Small town regeneration priority town	Proposed agri-hub	Role of settlement in rural development	
Total	100%					

LSDF 2016 nodal hierarchy

The current hierarchy of settlements and earmarked growth points formed the basis for evaluation and was regarded as the most important criterion to inform their current status.

The current growth points in the hierarchy of settlements for the LSDF, 2016, as well as a comparison of the district municipal SDFs, are depicted in Figure 19.

In the LSDF (Limpopo OTP, 2016), provincial growth points are defined as follows:

[Provincial growth points] represent the highest order nodes in the Province. In most cases, these cities and towns have an established and diverse economy, together with a range of higher order social and government services. Most importantly, these nodes have immense resource potential, predominantly mineral-related, which render them existing and/or future core nodes in the provincial, and even national economy. Four of these nodes were also earmarked as Special Economic Zones (SEZs) in the Limpopo Development Plan. The bulk of future economic development will be undertaken by the private sector, but should be supported by public investment in sufficient and high quality engineering infrastructure, and additional social services to serve the fast-growing local populations.

District growth points are defined as follows:

[District growth points] comprise nodes that are very well positioned along the national and provincial movement network and have a strong resource base (including mineral potential and agricultural activities). They function as high order service centres, have relatively large local populations, and have relatively well established institutional cores and relatively strong economies. However, while some of them have a well-established CBD and active industrial area, others lack economic- and engineering infrastructure due to years of under-investment. All District Growth Points have potential for economic growth, which should be supported by public investment in infrastructure, but especially high levels of public investment [are] needed to unlock the potential of historically under-invested nodes.

Municipal growth points are defined as follows:

[Municipal growth points] represent large rural settlement clusters (between 75 000 and 100 000 people), but with very small economic and institutional bases, and very limited local resources on which to build. However, they are accessible via the provincial road network, and thus well located to serve the respective population clusters. It is proposed that these areas be prioritised for the provision of engineering infrastructure, higher order community facilities, as well as economic infrastructure where relevant.

And rural nodes/service nodes are defined as follows:

[Rural nodes/service nodes] represent two categories. The first is namely a village situated in the midst of a high number of small scattered villages that are isolated/ removed from the provincial road network. The isolated location of these villages is deterring efficient service delivery, hence the identification of a nodal point among these villages where services will be clustered to the benefit of the broader area.

The second category comprises small 'towns' that are situated along the provincial road network, in the midst of extensive commercial farming areas and which serve relatively few local residents/ farming communities. Both categories generally have limited economic and institutional bases at present. Social services are to be consolidated at these nodes to efficiently serve the extensive surrounding rural communities. Although small local economies might emerge over time as a result of the proposed agglomeration of public services, it is acknowledged that the economic potential of these nodes is less than the three types of Growth Points described above. The focus should thus be on community infrastructure and not necessarily economic infrastructure.

In respect of the evaluation criteria given in Table 4, provincial growth points carry the highest weight, district growth points the second highest, municipal growth points the third highest, and rural nodes/service nodes the lowest. Any settlement below this classification did not impact on the evaluation and received no points.

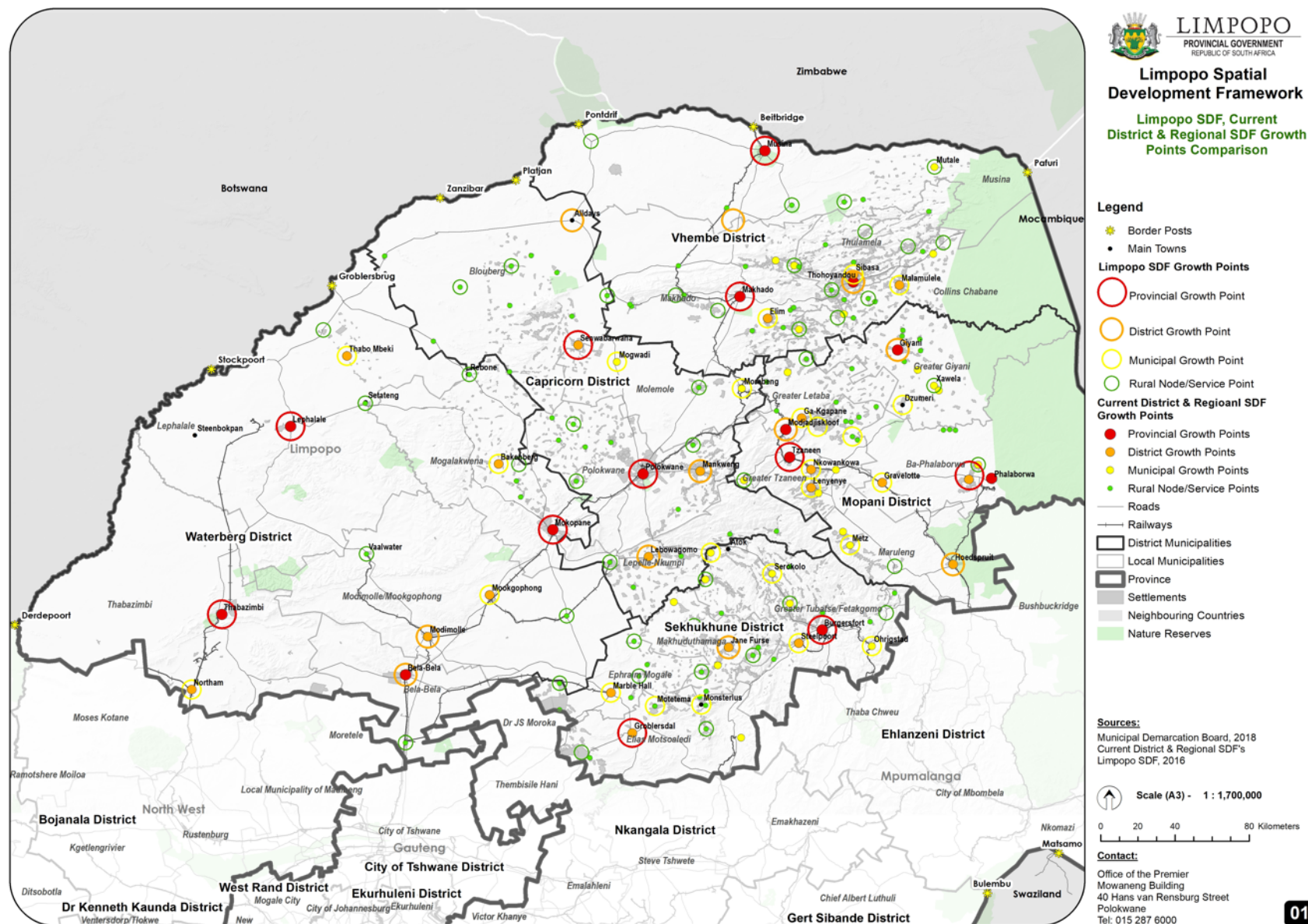


Figure 19: Current settlement hierarchy as contained in the Limpopo SDF 2016 and district municipal SDFs

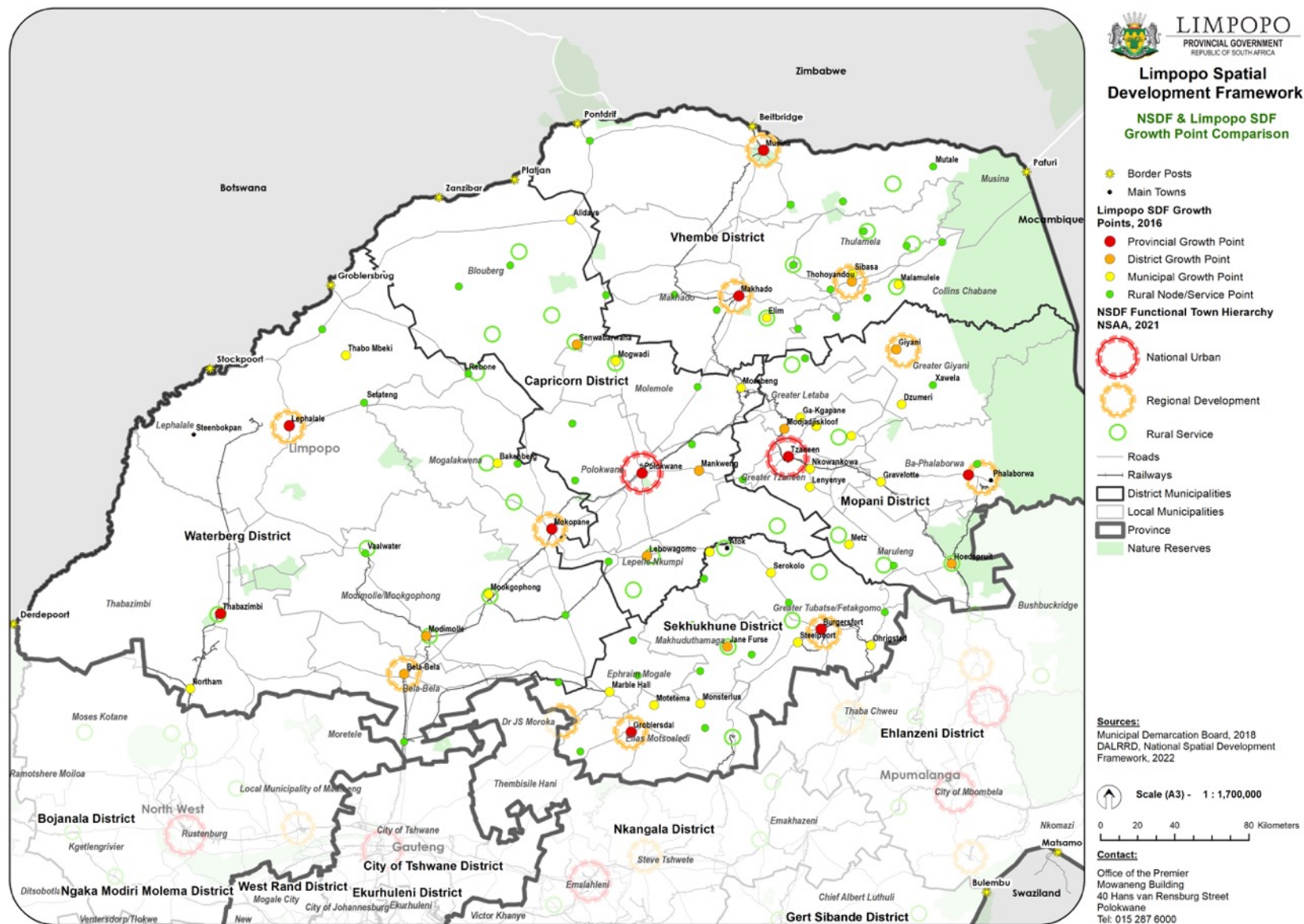


Figure 20: National SDF nodes in Limpopo

NSDF system of node and corridors

The nodes proposed in the NSDF, 2022 formed an important criterion in the evaluation because of the proposed national and regional function of settlements.

The current nodes for Limpopo, as contained in the NSDF, 2022 and in the LSDF, 2016, are depicted in Figure 20.

The NSDF (DALRRD, National Spatial Development Framework, 2022) uses the Regional–Rural Development Model to provide for both urban development and an increased productivity in rural regions, as shown in Figure 21.

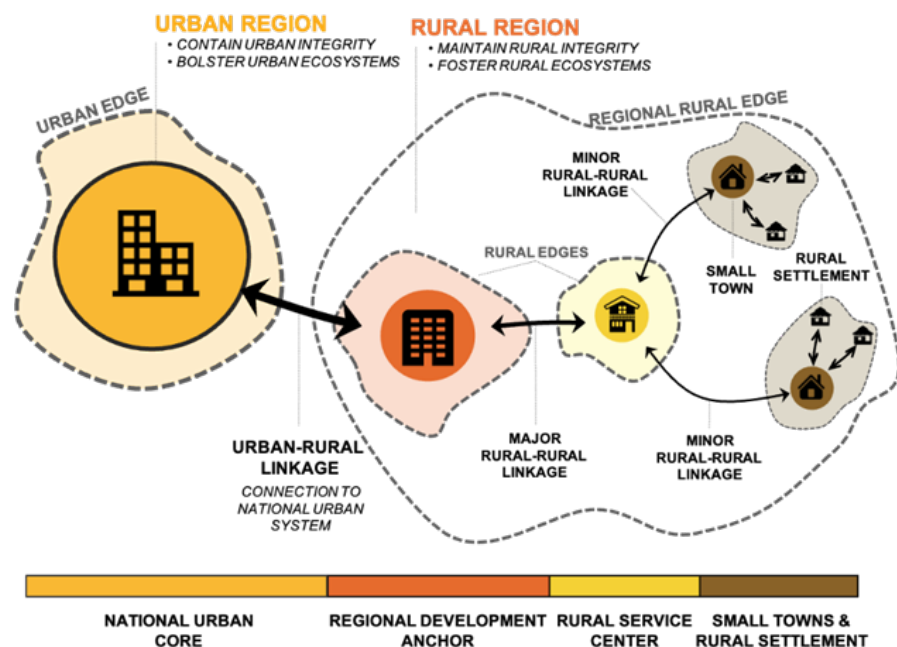


Figure 21: NSDF Regional–Rural Development Model

Source: (DALRRD, National Spatial Development Framework, 2022)

The following is written about the Regional–Rural Development model:

[The model] takes a systemic view of rural areas and proposes the “soft delineation” of “polycentric functional rural regions” that have at least one well-connected regional development anchor, located both within the region, and on the national transport network to “anchor” the region as a whole in, and connect it to the national space economy, have social, cultural, historical, economic and cultural characteristics and attributes that would make the development of a “functional rural region” possible over time, and lastly have the potential for intra-regional rural-rural and rural-urban trade between towns and villages in the region. (DALRRD, National Spatial Development Framework, 2022)

With reference to Limpopo, the NSDF provides for the following system of nodes:

- National urban nodes
- Regional development anchors
- Rural service centres
- Small towns and rural settlements

Another important aspect to bear in mind is that the NSDF (DALRRD, National Spatial Development Framework, 2022) uses a National Spatial Social Service Provisioning Model (also referred to as the Social Services Wheel) with a hierarchical approach in support of the Regional–Rural Development Model. The model is shown in Figure 22.

The NSDF provides that “in terms of this model, the higher the order of a service in a category, and the larger its spatial reach, the higher the order of place it is to be placed/located in”.

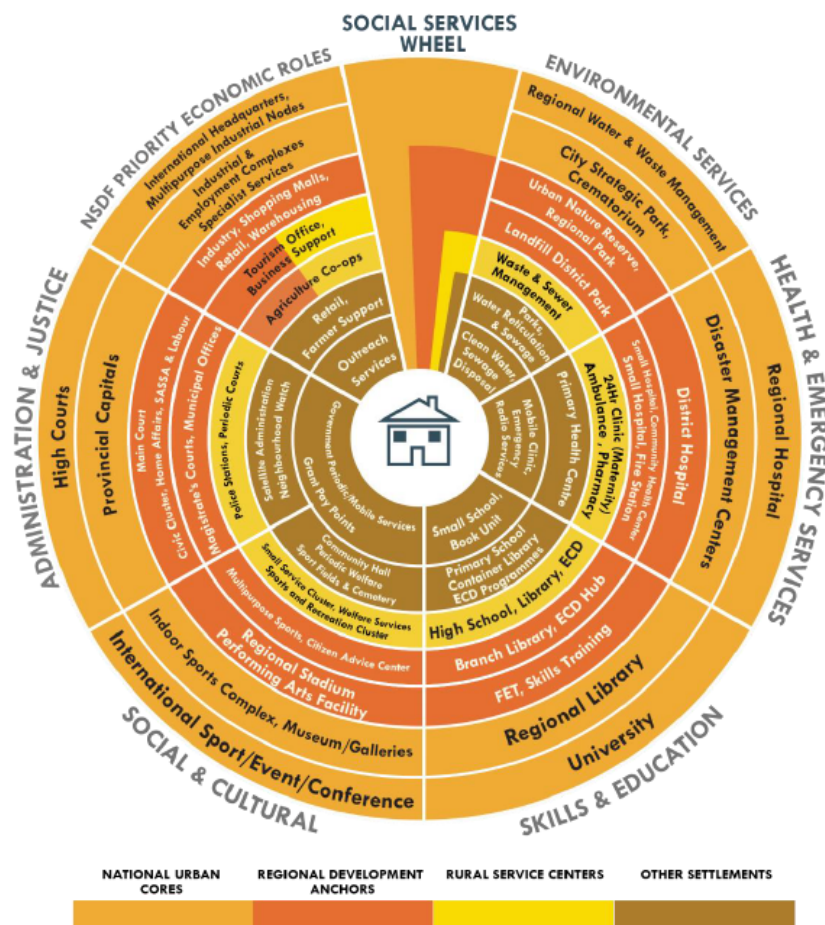


Figure 22: NSDF Social Services Wheel

Source: (DALRRD, National Spatial Development Framework, 2022)

Regional, district or local municipal spatial development frameworks' nodal hierarchies

Local circumstances were regarded as the third most important criterion in respect of the nodal hierarchies because vertical alignment needs to

be taken into consideration, and it is accepted that district and local municipalities have a more “hands-on” approach in respect of development needs.

In most cases, the district municipal SDF proposals were used as inputs, but, where necessary, proposals from local municipal SDFs were also used, especially where reviews had recently been undertaken by local municipalities. In the case of the Musina–Makhado Regional Spatial Development Framework (RSDF), the proposals were also considered. There were very few differences in terms of the ranking in the district SDF and the regional SDF, though.

Some changes in terms of the hierarchy in the Vhembe district are proposed in the Musina–Makhado SEZ RSDF (Limpopo Dept. Cooperative Governance Human Settlements and Traditional Affairs, 2021). They include:

- A new secondary node for the Musina–Makhado SEZ (southern site) along the N1 corridor (also refer to Section 4.2.2.5 in respect of the Limpopo PSHDA 7: Musina–Makhado SEZ)
- Senwabarwana as the primary node (previously the district growth point in the district municipal SDF)
- Alldays as the secondary node (previously the municipal growth point in the district municipal SDF)

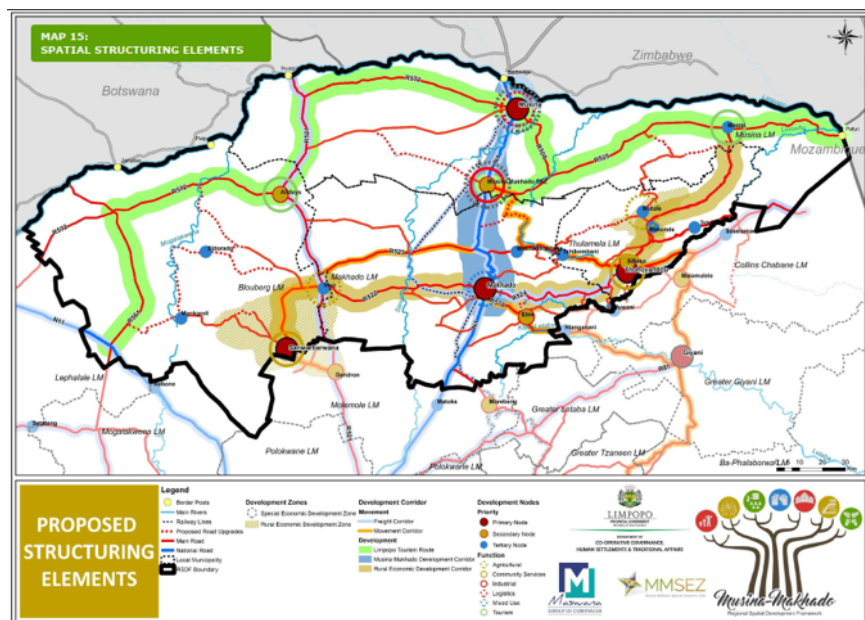


Figure 23: Musina–Makhado SEZ Regional SDF

Source: (Limpopo Dept. Cooperative Governance Human Settlements and Traditional Affairs, 2021)

The hierarchy used correlates to a large extent with the hierarchy of the provincial SDF:

- Provincial growth point or first-order settlement or primary node
- District growth point of second-order settlement or secondary node
- Municipal growth point or third-order settlement
- Rural node or service point

LDP 2020-2025 nodal strategy prioritisation and economic investment

The Limpopo Provincial Government adopted a nodal strategy and growth point programme to prioritise economic investment nodes that

serve as provincial growth points in the Limpopo SDF. These economic investment areas are as follows:

- Musina–Makhado Corridor: Musina–Makhado SEZ, coal and metallurgical cluster, coal and diamonds, logistics, horticulture, forestry
- Fetakgomo Tubatse: Precious group metals (PGM) – platinum and chrome cluster, proposed as a special economic zone (SEZ) or industrial hub
- Polokwane: Logistics and services hub, developed metro status programme
- Tzaneen: Agriculture (horticulture and forestry) and tourism
- Phalaborwa: Copper and magnetite cluster, tourism and agriculture
- Elias Motsoaledi: Agribusiness and mining-related industries
- Lephalale: Energy (coal and gas), developed green city strategy
- Mogalakwena: Mining (PGM), agriculture and tourism
- Thabazimbi: Mining (PGM), agriculture and tourism

The LDP states that the province has been implementing the growth point programme for the past ten years. Investment in these nodes has been constrained by a lack of bankable projects and dedicated funding for the growth point municipalities. As a result, the LDP provides that the government will reprioritise one municipality per district:

- Lephalale in the Waterberg district
- Polokwane in the Capricorn district
- The Musina–Makhado Corridor in the Vhembe district
- Fetakgomo Tubatse in the Sekhukhune district
- Tzaneen in the Mopani district

In terms of the evaluation, these five prioritised areas or nodes received a higher weight in this category.

CSIR settlement typology

The CSIR developed a settlement typology as a planning tool or mechanism to identify, calculate and analyse a set of development data

and trends pertaining to a range of towns and cities, as well as high-density rural settlements.

The CSIR (CSIR, 2018) mentions the following:

The CSIR Functional Town Typology has been developed with the specific purpose to provide a fine grained, but nationally comparable overview of regional scale settlement patterns and trends. The latter provides a mechanism to identify, calculate and analyse a set of development information and trends pertaining to the range of towns and cities, as well as high density rural settlements across South Africa. It enables profiling of specific settlements and or the analysis of demographic and economic trends of a set of settlements with similar scale and type. The typology enables calculating the population and the economy of functional town areas, comparing town areas relative to non-town areas and exploring regional and spatial inter-relations. It also enables temporal and spatial comparison at a regional scale of settlements independent of municipal boundary demarcation.

The typology includes a wide range from city regions (e.g., large urban conurbations with over 1 million people, such as Cape Town) up to the smaller rural settlement areas and villages and sparsely populated rural areas.

The complete range includes city regions, cities and very large regional centres, large regional centres, regional centres, service towns, small service towns, rural service settlements, small towns, rural settlement areas and villages, and sparsely populated rural areas.

As in the NSDF, 2022 there is a relationship between settlements’ sizes and roles:

[Settlements] can or should play with respect to the strategic location of different categories of social services that would typically be associated with (and expected to be delivered by) such level of place, and serve both for its residents and those living within its service region. (CSIR, 2023).

The conceptual relationship is also illustrated in a service wheel, which is depicted in Figure 24. The wheel illustrates, from the outside towards

the centre of the wheel, a declining hierarchy of settlements. For each level, examples of appropriate service types are indicated.

The settlement typology for Limpopo is depicted in Figure 25.

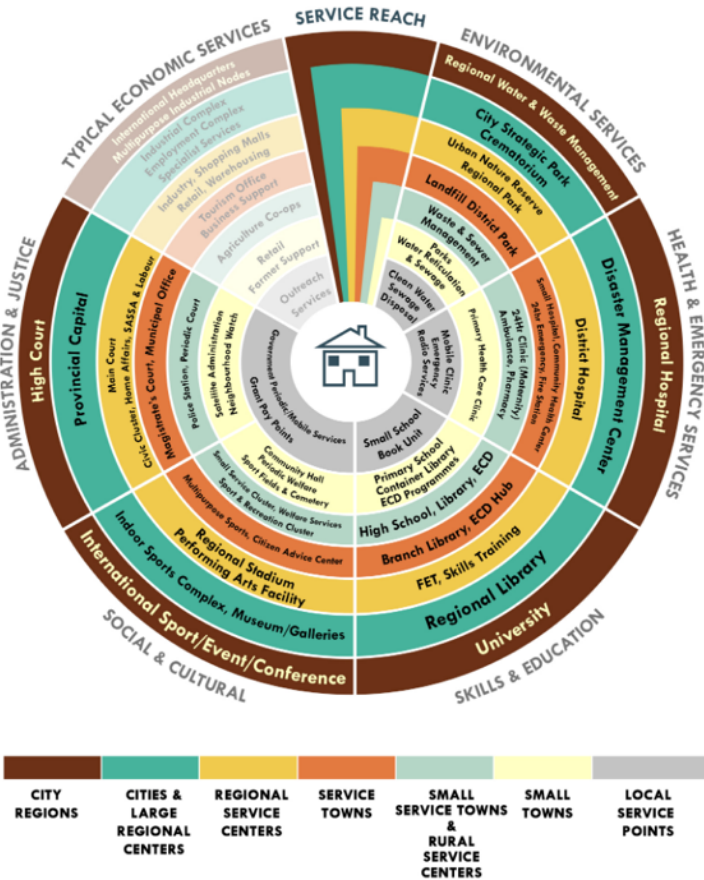


Figure 24: CSIR functional town typology service wheel

Source: (CSIR, 2023)

For the evaluation of the Limpopo nodes, only the settlement types from the CSIR’s typology that are set out in Table 5 applied to Limpopo context and was used.

Table 5: CSIR settlement typology used for Limpopo

Typology order	Criteria
Cities and very large regional centres	Population: > 500,000 people; Morphology: Dense urban areas; Economy: Service-related.
Large regional centres	Population: 10,000–300,000 people; Morphology: Regional node.
Regional centres	Population: < 100,000 people; Morphology: Regional node consisting of interconnected settlements
Service towns	Population: 15,000–100,000 people; Economy: Providing economic and social service anchor role to hinterland.
Small service towns	Population: < 20,000 people; Morphology: Monochrome small town; Local service role: Playing an anchor role as social service point, serving a large number of people within 30 km from the town in denser areas and within 50 km from the town in sparser areas; Economy: Government and community services.
Rural service settlement	Population: Varied in nodal settlement, large population in direct hinterland; Morphology: Emerging nodes of consolidation in dense rural settlements; Local service role: Strategically located to play an anchor role as social service point, serving a large number of people within 30 km from the town in denser areas and within 50 km from the town in sparser areas.

Source: (CSIR, 2023)

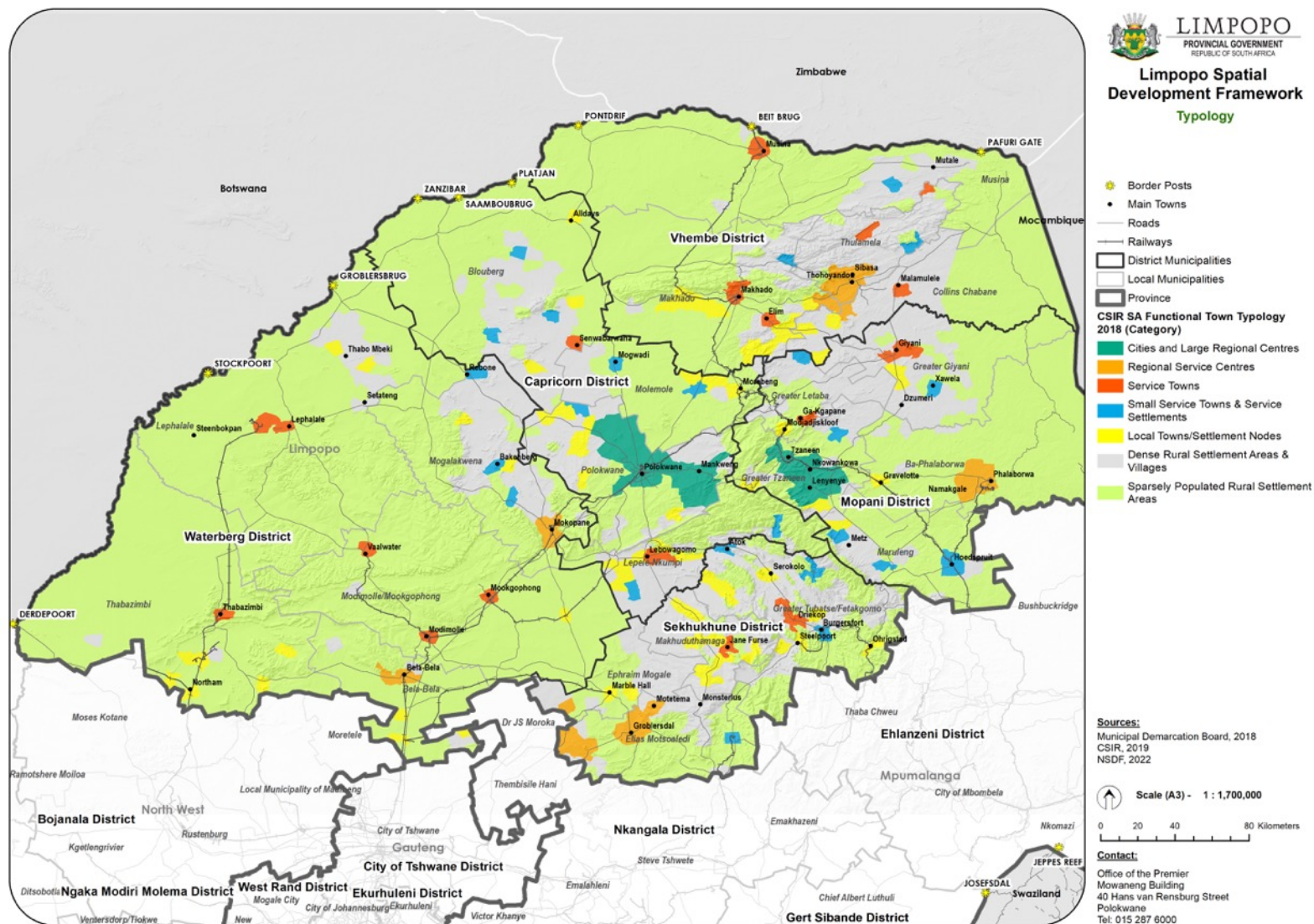


Figure 25: The CSIR settlement typology for Limpopo

Source: (CSIR, 2018)

For the evaluation of the current settlements in the province, the categories were grouped together and simplified as follows:

- Cities and large regional centres
- Regional service centres
- Service towns and rural service settlements

The categories are depicted in Figure 26.

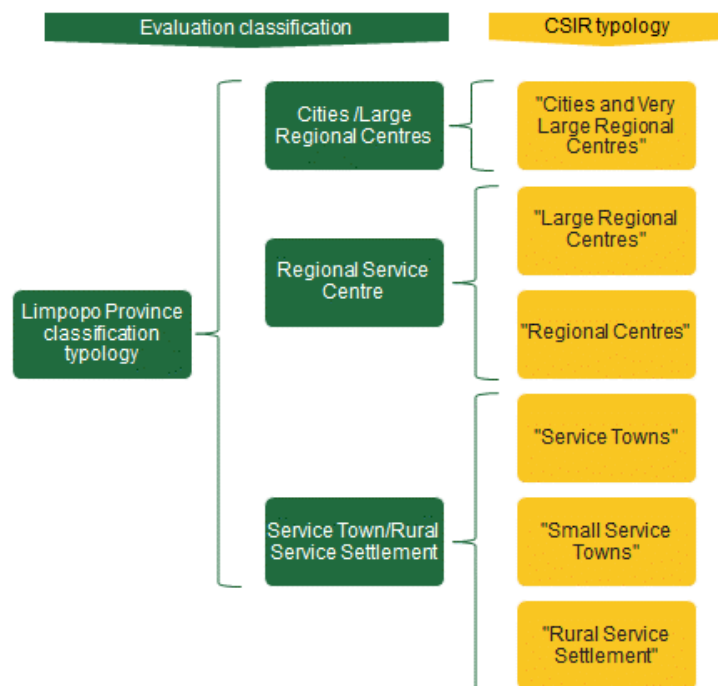


Figure 26: Limpopo classification of settlement typology

Residential structure growth in settlements

The actual residential structure growth between 2015 and 2020 was analysed from the CSIR analysis of the GTI spatial data building based land use (BBLU) 2022 of residential structures as it gave an indication of growth pressure.

For the purpose of the multi-criteria analysis, the following classification was used to evaluate the growth in residential structures:

- Areas with very high/extreme residential growth (evaluation assigned: 5%)
- Areas with high residential growth (evaluation assigned: 3%)
- Areas with moderate residential (evaluation assigned: 1.5%)
- Areas with low or no residential growth did not receive any point.

Connectivity

The NSDF, 2022 defines a development corridor as follows:

An integrated linear network of dense infrastructure, economic activity and residential development built on and along a major road and/or railway line that (1) bind(s) it together and (2) act(s) as (a) form-giving and structuring spine(s). Development corridors typically fulfil a variety of multiple, complex and interrelated functions, such as: (1) the movement of people and freight; (2) retail and trade; (3) the flow of information; (4) the provision of basic services, such as water and gas; and (5) tourism. Supportive functions may also be located in corridors, e.g. logistics. Development corridors generally include both a human settlement and economic component, i.e. (1) higher-density, transit-oriented mixed-use residential development, and (2) industrial, retail, entertainment and office development adjacent to, or along, the main transport routes. (DALRRD, National Spatial Development Framework, 2022)

Regarding the evaluation, keeping the national priorities in mind, the national development corridors of the NSDF, as shown in Figure 27, were used as the criterion with the highest weight.

At a provincial level, secondary to the national development corridors, the strategic provincial routes, such as priority road networks, freight and public transport routes, were recognised. These routes were identified in the Limpopo Land Transport Framework 2023 and are also included in section 0.

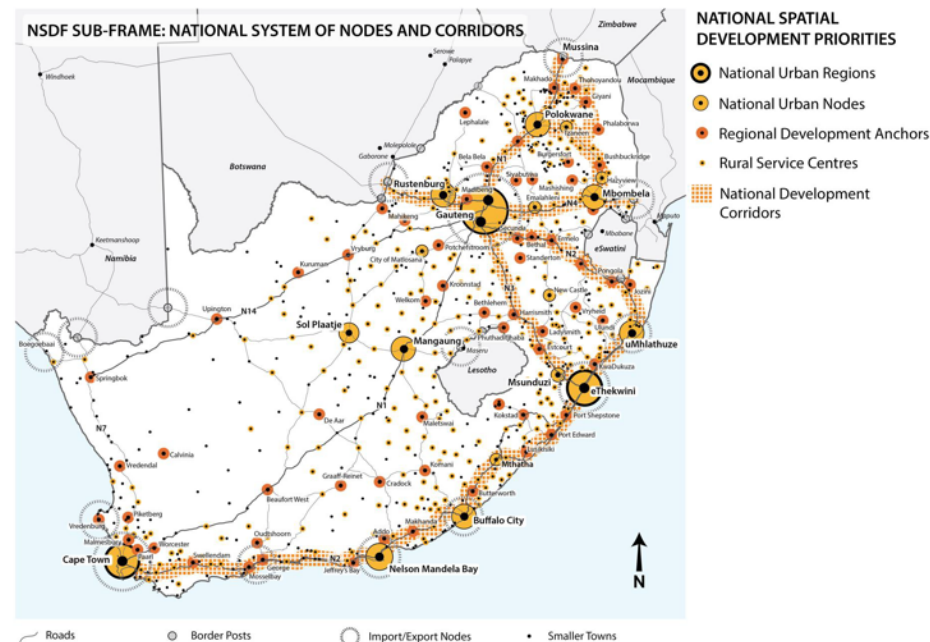


Figure 27: NSDF National Development Corridors

Source: (DALRRD, National Spatial Development Framework, 2022)

Spatial targeting

The following sub-criteria were considered in respect of the impact of spatial targeting on the re-evaluation of the nodal hierarchy:

- Spatial transformation
- Human settlements
- Mining and freight
- Industrial
- Agriculture and rural development

In respect of **spatial transformation**, the NSDF's Eastern Escarpment National Spatial Transformation and Economic Transition Region (NSTETR) as a national spatial action area referred to in the NSDF (DALRRD, National Spatial Development Framework, 2022) was used as criterion.

All settlements in the NSTETR received a scoring in this regard. The higher-order settlements in Limpopo that were included in the evaluation and that fall in the transformation area include Polokwane, Musina, Tzaneen, Burgersfort, Makhado, Namakgale, Lulekani, Humulani and Ben Farm, Thohoyandou, Phalaborwa, Giyani, Nkowankowa and Lenyenye, Jane Furse, Mankweng, Malamulele, Elim, Modjadjiskloof, Driekop, Steelpoort, Ga-Kgapane, Morebeng, Gravelotte, Vuwani and Ohrigstad.

The priority human settlement and housing development areas (PHSHDAs) promulgated for the province as important spatial targeting areas were scored for the **human settlement priority** criteria for the evaluation. The towns or areas that were scored include Polokwane, Giyani, Nkowankowa, Tzaneen, Burgersfort/Tubatse, the Musina–Makhado SEZ, Musina, Thohoyandou, Lephalale and Northam-Thabazimbi.

A settlement was scored for the purposes of the evaluation if it is located in one of the following nationally prioritised **Revitalisation of Distressed Mining Communities' Municipality**:

- Elias Motsoaledi Municipality
- Fetakgomo Tubatse Municipality
- Lephalale Municipality
- Mogalakwena Municipality
- Thabazimbi Municipality

In respect of spatial targeting, areas or settlements that are earmarked in the current SDF as **freight and logistics hubs** also received higher scoring. They include:

- Polokwane as logistics and road, rail and air cargo freight hub
- Musina as logistics and road, rail and air cargo freight hub
- Lephalale as road and rail freight hub

- Marble Hall as road and rail freight hub
- Burgersfort as road and rail freight hub
- Hoedspruit as rail freight hub

Industrial development

The following spatial targeting areas in respect of industrial development initiatives in the province scored for the evaluation:

- Settlements or areas where special economic zones (SEZs) have been promulgated, e.g. Musina–Makhado
- Earmarked industrial hubs or areas with considerable industrial development, e.g. Polokwane and Burgersfort/Tubatse
- Settlements or areas where SEZs are under consideration or proposed

Agriculture and rural development

Settlements or nodes identified as agri-hubs in terms of the government's agri-parks programme were scored for the evaluation of nodes. Secondly, settlements that are located in rural areas and that may contribute towards rural development in marginalised areas, such as areas located in areas under traditional authority, also impacted on the evaluation.

4.1.5.2 Settlement evaluation results

The results are set out in Table 6 and spatially illustrated in Figure 28. The table includes the Top 20 settlements in the province based on the current settlement hierarchy and the roles of the settlements in the province.

Other settlements that scored 40% to 60% include Lebowakgomo (57%), Hoedspruit (54%), Elim (51%), Mookgophong (49%), Steelpoort (45%), Mogwadi (42%), Ga-Kgapane (42%) and Driekop (41%).

Table 6: Settlement evaluation in Limpopo

Ranking	Settlement	Total score
1	Polokwane	94%
2	Burgersfort/Tubatse	92%
3	Musina	91%
4	Tzaneen	90%
5	Makhado	83%
6	Lephalale	83%
7	Namakgale	82%
8	Phalaborwa	81%
9	Mokopane	81%
10	Thohoyandou	79%
11	Groblersdal	72%
12	Thabazimbi	72%
13	Giyani	66%
14	Bela-Bela	64%
15	Jane Furse	63%
16	Mankweng	63%
17	Modimolle	62%
18	Nkowankowa/Lenyenye	61%
19	Senwabarwana	58%
20	Malamulele	58%

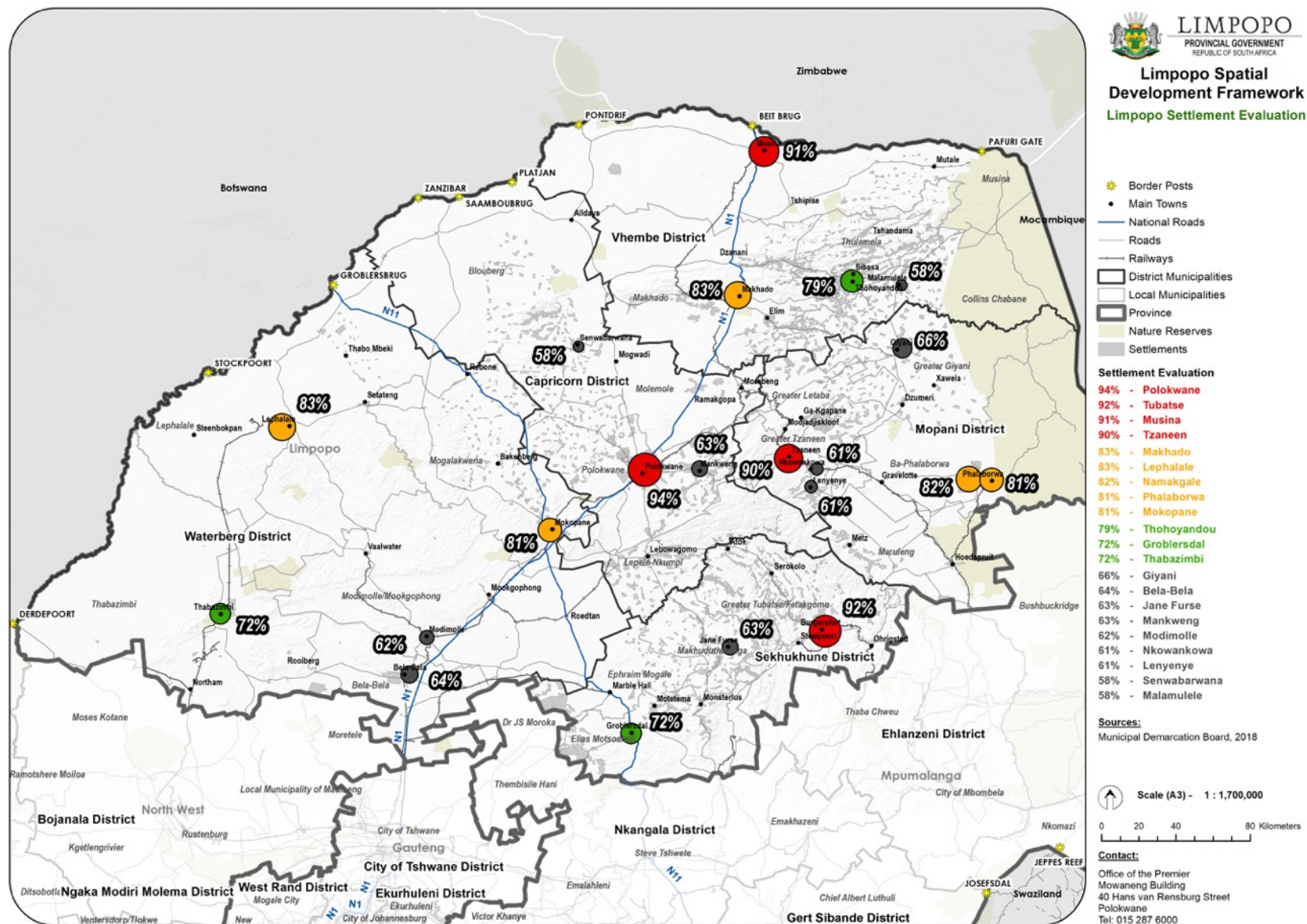


Figure 28: Limpopo settlement evaluation

4.2 Built environment trends

A status quo analysis was undertaken of the transport movement patterns, human settlements trends, land availability, social infrastructure and rural development trends impacting on the built environment.

4.2.1 Main transport movement patterns

The role of transport is to facilitate access and the movement of people and goods, which directly influence the social, economic and even cultural development of communities. Hence transport networks and systems and spatial distribution of economic activities inform the movement patterns.

4.2.1.1 Traffic volumes

Figure 29 and Figure 30 show the Average Daily Traffic (ADT) and Average Daily Truck Traffic (ADTT) respectively. The SANRAL roads traffic volumes were obtained from SANRAL for the year 2021 and traffic volumes on RAL roads were obtained from RAL for the year 2016.

The following routes have high ADT volumes of between 5,000 and 10,000 vehicles per day:

- N1 Modimolle to Polokwane to Makhado
- R31 Ga-Kgapane to Tzaneen
- R524 Makhado to Thohoyandou
- R71 Polokwane to Tzaneen
- R36 Tzaneen to Nkowankowa to Lenyenye
- R510 Thabazimbi to Gauteng through Northam
- R579 Lebowakgomo to Polokwane
- R37 Serokolo and Steelpoort
- R71 Namakgale to Phalaborwa

The routes with high ADT highlights to movement patterns towards main nodes such as Polokwane and Tzaneen. It also shows the linkages between

the mining areas in the Waterberg with the Rustenburg platinum belt via the R510.

The following routes have medium to high ADTT volumes of between 500 and 2,000 vehicles per day:

- N1 Modimolle to Polokwane (>2000)
- N1 Polokwane through Makhado to Musina
- R71 Polokwane–Tzaneen– Lenyenye and also from Tzaneen to Letsitele
- N11 Mokopane to Grobler's Bridge
- N11 between Marble Hall and Groblersdal
- R555 from Burgersfort to Monsterlus to Mpumalanga
- R81 and R31 Polokwane to Tzaneen
- R516 Thabazimbi to Bela-Bela
- R524 Makhado to Thohoyandou
- R33 Lephalale–Vaalwater–Modimolle
- R521 Polokwane to Mogwadi
- R579 Polokwane to Lebowakgomo
- R510 Thabazimbi to Northam to Northwest/Gauteng

The routes with these high ADTT volumes clearly affirm the economic patterns in the province. The routes connect industrial and mining activity, as well as commercial agriculture in the various regions with freight corridors. It also shows the occurrence of freight corridors with truck traffic from neighbouring countries such as Zambia and Zimbabwe (R521, N11 and N1).



Figure 29: Road traffic (ADT)



Figure 30: Road heavy vehicle traffic (ADTT)

4.2.1.2 Public transport network

Public transport routes are categorised as interprovincial routes (primary routes) or intraprovincial routes (secondary routes). Primary routes enable travel across regions and districts by linking cities and major nodes or towns in a province and connecting the province to other provinces. Intraprovincial routes, on the other hand, link district nodes to interprovincial routes and provide access to a range of land use activities and public services in a district.

Figure 31 shows the interprovincial and intraprovincial routes and Figure 32 the public transport passenger volumes as depicted in the Limpopo Integrated Public Transport Network (2010).

The primary network indicates high passenger volumes (30,000 to 50,000) (2009 values) during the AM peak period in the following areas:

- Bela-Bela to Modimolle (R516–R101)
- Gauteng to Modimolle (N1)
- Elandsdoorn to Groblersdal (R25)
- Groblersdal to Motetema (R33)
- Monsterlus to Lebowakgomo via Jane Furse (R579)
- Stoffberg (Mpumalanga to Ohrigstad via Steelpoort) (R555)
- Tzaneen to Phalaborwa (R71)
- Lephalale to Setateng (R33)
- Lephalale to Vaalwater (R518)
- Mica–Tzaneen (R526)
- Makhado to Saselamani via Thohoyandou (R524)
- Louis Trichardt to Giyani (R578)
- Giyani to Nkowankowa (R529)

The high passenger volumes clearly reflect commuting patterns in the province and the linkages to Gauteng. The high passenger volumes on the R25, R33 and R579 between Gauteng, Groblersdal, Jane Furse and Lebowakgomo, re-affirms the community need and Ephraim Mogale

municipal SDF proposals for improved and access to the settlements around Jane Furse and Lebowakgomo, from Gauteng.

The projected public transport routes and passenger volumes for 2029 are indicated in Figure 33. A forecast horizon of 20 years and an average population growth rate of 3.0% per annum was adopted, based on the relevant statistical data. In certain instances, high-growth areas with accelerated growth were identified, such as Polokwane, Phalaborwa, and other mining towns.

The projected passenger demand from 2009 to 2029 per district municipality during the AM peak period is summarised in Table 7.

Table 7: AM Peak Period Passenger Demand

District Municipality	Passenger Demand		
	Base Year 2009	Forecast Year 2029	Net growth
Vhembe	515,553	947,555	83.8%
Mopani	438,404	810,768	84.9%
Capricorn	329,271	727,777	121.0%
Sekhukhune	421,677	827,962	96.4%
Waterberg	131,664	355,239	169.8%
Total	1,836,569	3,669,301	

Based on the above summary, the passenger demand in the province in the AM peak period was anticipated to grow from 1,836,569 passengers to 3,669,301 passengers over the 20-year period from 2009 to 2029. This is equivalent to an average nett percentage growth of 99.8% for the province.

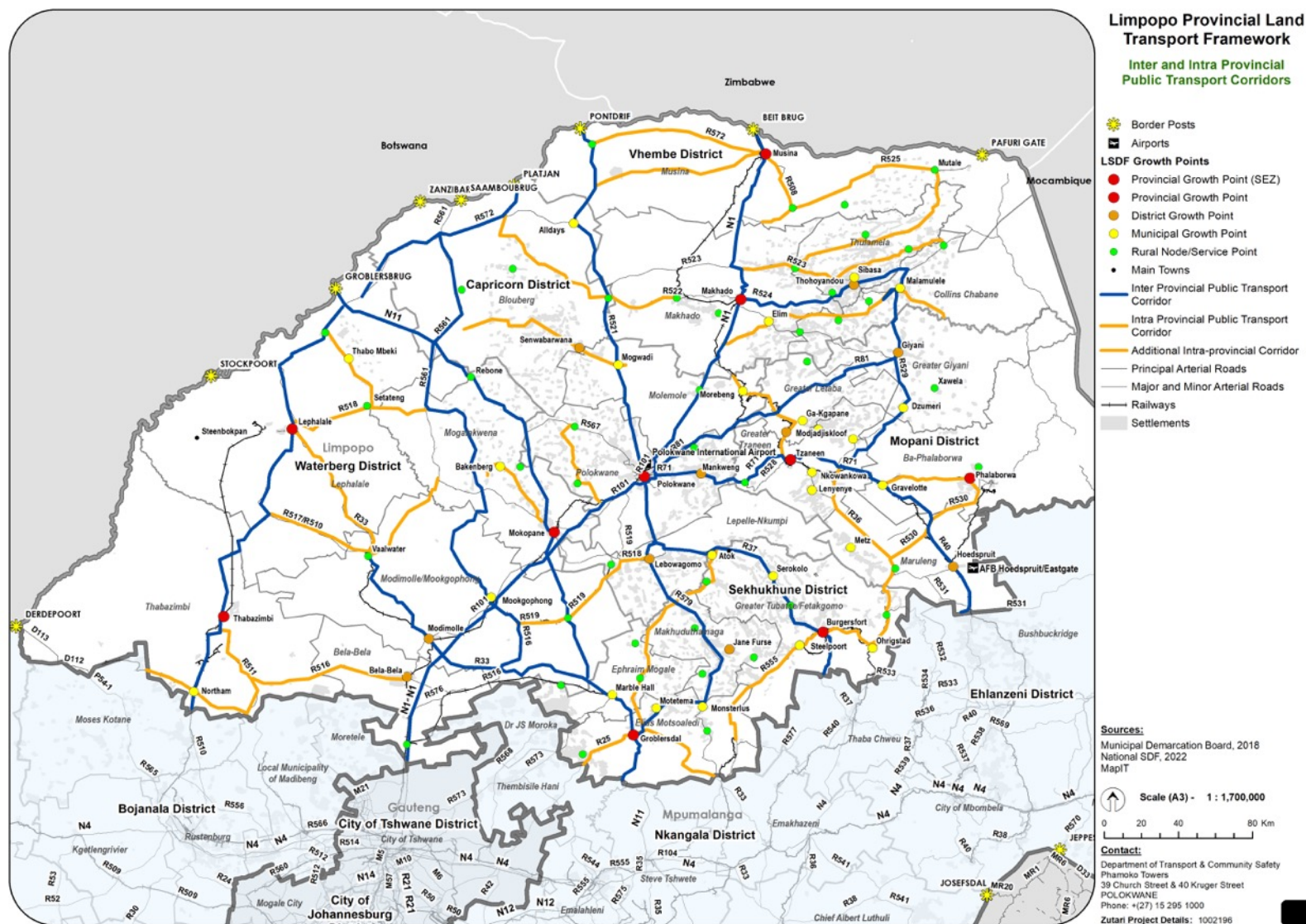


Figure 31: Interprovincial and intraprovincial routes



Figure 32: 2009 Public transport passenger volumes

Source : Limpopo IPTN, 2010

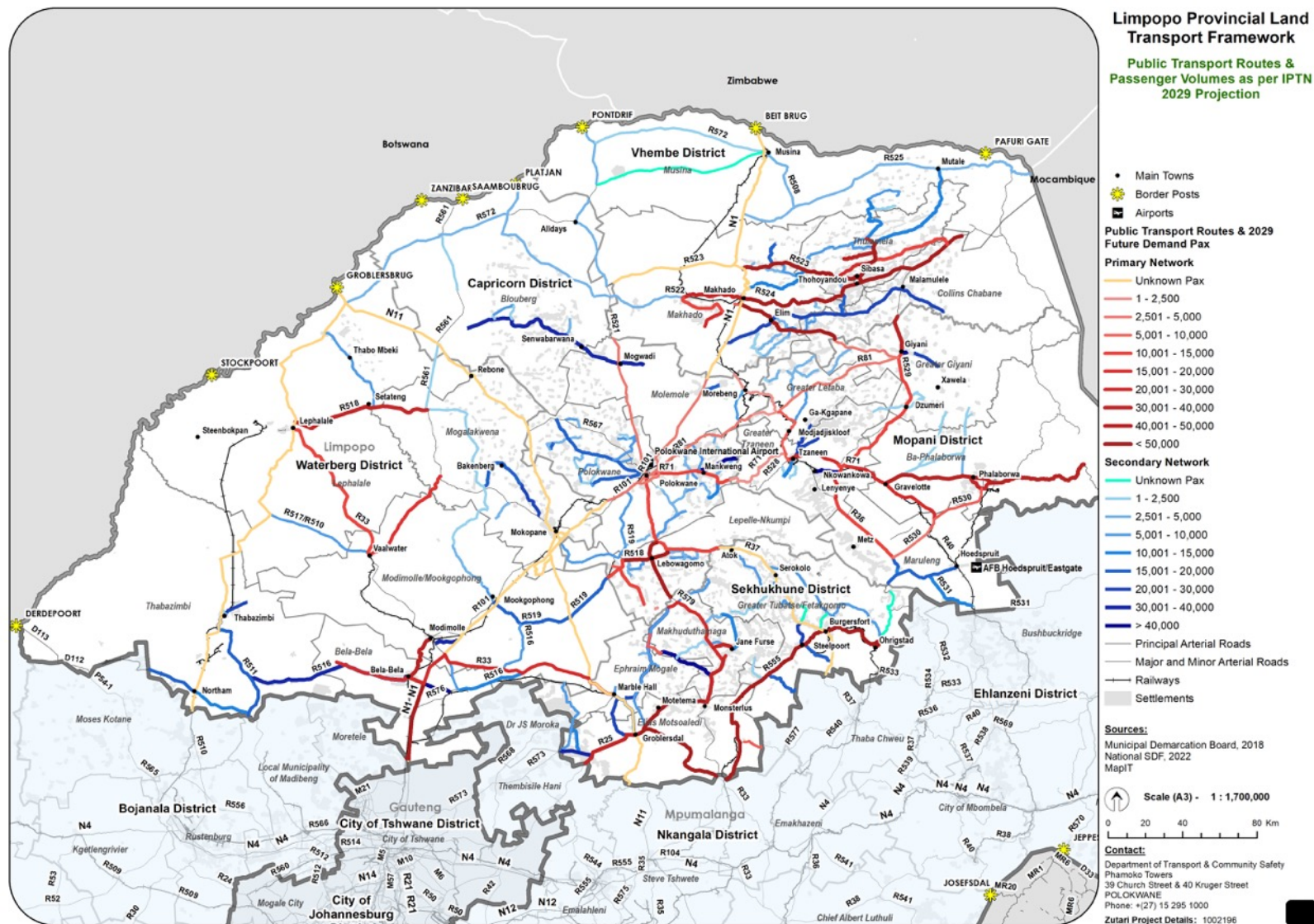


Figure 33: 2029 Projected public transport routes and passenger volumes

Source : Limpopo IPTN, 2010

4.2.1.3 NMT transport

Most of the travelling population in Limpopo (about 55%) walk all the way to their destinations. In 2020, it was estimated that approximately 1.8 million people in Limpopo used NMT as their main mode of transport. This was a decrease from approximately 2 million people who were estimated to use NMT in 2013. At a district level, most of the NMT trips in 2020 were made in Vhembe (28%), followed by Mopani (24%), Sekhukhune (21%), Capricorn (20%) and Waterberg (10%).

Although NMT is an important mode of transport in the province, it is not a mode of choice for many, as it is predominantly driven by necessity, not by choice. Spatial integration in Limpopo is a challenge, given the large number of communities that reside far away from urban amenities and key corridors and therefore must walk very long distances.

4.2.2 Human settlements

Human settlements planning in the province is directed by the Limpopo Multi-Year Human Settlements Development Plan (MYHSDP) 2019–2024, which is Part D to the Annual Performance Plan of the Limpopo Department of Cooperative Governance, Human Settlements and Traditional Affairs (COGHSTA). Aligned to the outcomes set for the Medium Term Strategic Framework (MTSF) 2019–2024, the plan is aimed at achieving spatial transformation through multi-programme integration in priority development areas (urban focus), households residing in adequate housing and improved quality living environments, and household security of tenure.

From a spatial perspective, the plan defines a human settlements development path for Limpopo that prioritises development spending in human settlements programmes to urban areas and in spatial targeting areas.

Figure 35 represents the national and provincial spatial targeting areas. At a national level, investment in land assembly, the interventions of the Human Settlements Development Grant (HSDG) and the Upgrading of Informal Settlements Partnership Grant (UISPG) are targeted to the 11 priority human settlements and housing development areas (PHSHDAs) that were declared for the province on 15 May 2020. Investment in infrastructure, informal settlements upgrading, land assembly and the creation of sustainable human settlements are ringfenced to the 5 prioritised mining towns in distress municipalities under the Special Presidential Package on the Revitalisation of Distressed Mining Communities. The so-called mining town municipalities are Fetakgomo Tubatse, Lephalale, Thabazimbi, Mogalakwena and Elias Motsoaledi.

Human settlements investment is also aligned to the gazetted Strategic Infrastructure Project No. 1 (SIP1) “Unlocking the northern mineral belt with Waterberg as the catalyst”. SIP 1’s projects originally included projects of more than 50,000 housing units focused around Steenbokpan due to the envisaged expansion in coal mining and the construction of additional power stations. The focus of investment is currently on the establishment of a green

city with the development of the Joe Slovo Integrated Human Settlements project (Altoostyd) and Marapong community residential units.

Aligned to the NSDF and LSDF, human settlements delivery is also prioritised according to the hierarchy of settlements and nodes, which reaffirms the focus of investment in urban areas rather than rural areas.

At a provincial level, the provincial growth points in the LSDF and the Musina–Makhado SEZ are prioritised, as well as the Fetakgomo Tubatse industrial hub/proposed SEZ, which also forms part of the Revitalisation of Distressed Mining Communities programme.

According to the StatsSA Community Survey 2016, most households in the province (88.9%) reside in adequate dwelling types. Despite progress in improving the housing situation in the province, the StatsSA Community Survey 2016 recorded that 10% of households in the province do not have access to adequate housing as mandated in the Bill of Rights.

From 2016, the Department of Cooperative Governance, Human Settlements and Traditional Affairs (COGHSTA) has continued to deliver housing opportunities on an annual basis according to their mandate. The negative impact of the COVID-19 pandemic on the delivery of housing units and serviced stands is evident in the decline in delivery from 2020/2021, which is shown in Figure 34. The human settlements delivery environment was shaken by the pandemic and required immediate responses with regard to vulnerable households and areas that require de-densification.

The significantly reduced fiscal budget allocations to the province necessitated a further policy shift to deliver serviced sites as opposed to top structures, and to empower communities to build their own houses through the Zenzeleni approach. Figure 34 illustrates the narrowing gap between investment in serviced sites vs top structures. However, the implementation of this policy directive and the biased focus on urban areas have been met with challenges related to insufficient bulk infrastructure capacity in the spatial targeting areas. This situation required a further focus on investment in bulk infrastructure to unlock the spatial targeting areas, and priority was given to bulk infrastructure upgrading to Burgersfort, Thabazimbi and Lephalale.

Simultaneously, invasion of land earmarked for human settlements as well as growth in informal settlements impact on the original planned development path for spatial targeting areas and the housing demand.

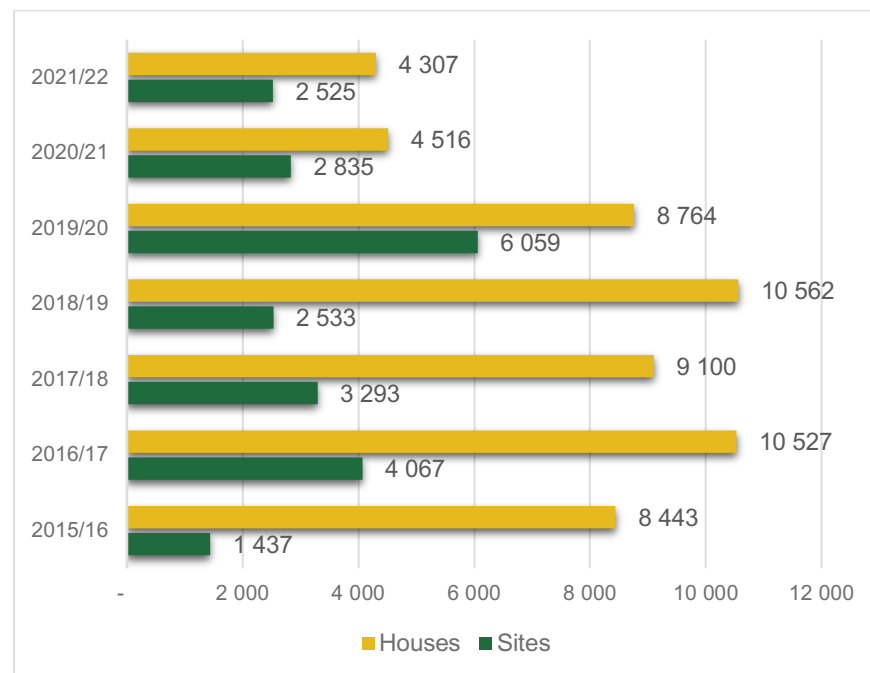


Figure 34: Annual HSDG delivery of housing units and serviced sites

Source: Limpopo COGHSTA, February 2023



Figure 35: Human settlements spatial targeting areas

Source: MYHSDP 2019-2024

4.2.2.1 Household dwelling types and housing backlog

The Constitution states that everyone has the right to access to adequate housing through housing programmes. As such, the status of households in the province that reside in inadequate dwellings needs to be determined and responses, including spatial responses, developed.

The adequate and inadequate types of dwellings in which households live, according to the Community Survey 2016, are summarised in Table 9 at a provincial and district level, whilst Table 8 lists the StatsSA census types that comprise the two dwelling types.

Table 8: Adequate vs inadequate dwelling types

Adequate dwellings	Inadequate dwellings
<p>Formal dwelling:</p> <ul style="list-style-type: none"> • House or brick/concrete block structure on a separate stand, yard, or farm • Flat or an apartment in a block of flats • Cluster house in a complex • Townhouse (semi-detached house in a complex) • Semi-detached house • House/flat/room in a backyard • Room/flatlet on a property or larger dwelling/servant's quarters/granny flat 	<p>Informal housing:</p> <ul style="list-style-type: none"> • Informal dwelling (shack in a backyard) • Informal dwelling (shack not in a backyard, e.g. in an informal/squatter settlement or on a farm) • Traditional dwelling/hut/structure made of traditional materials • Caravan/tent • Other/not applicable

Source: Limpopo MYHSDP 2019–2024

As indicated in Table 9, most households in the province (88.9%) resided in adequate dwellings (also referred to as “formal dwellings”), whilst 10% of households stayed in inadequate dwelling types in 2016. Of those 10% residing in inadequate dwellings, 5.1% were recorded to be staying in traditional dwellings and 4.8% in informal dwelling types.

In the three districts of Waterberg (14.3%), Vhembe (13.1%) and Sekhukhune (11.1%), the percentage of households that were staying in

inadequate dwellings was higher than the provincial average of 10%. The main inadequate dwelling type in the Waterberg and Sekhukhune districts was informal dwellings. In the case of the Vhembe district, households regarded to be staying in inadequate dwellings mainly resided in traditional dwellings (10.3%).

Households residing in inadequate dwellings make up the provincial housing backlog. After the deduction of units delivered since 2016, the Limpopo MYHSDP, 2019–2024 estimated the total provincial housing backlog at 124,849 households residing in inadequate dwellings. Of this backlog, 22% of households are located in urban areas, 68% in traditional areas, and the remaining 10% in rural areas.

According to StatsSA Community Survey, 2016, 10,8% of child-headed households in the province, or 2,804 child-headed households, reside in inadequate dwellings, most of which are in the Collins Chabane (732 households) and Greater Giyani (264 households) municipalities. These vulnerable households form part of the housing backlog.

The Limpopo MYHSDP, 2019–2024 estimated the housing backlog to comprise of informal dwellings and backyard dwellings (57.9%), while traditional dwellings make up 40.8% of the total backlog. The largest concentrations of backyard shacks are found in the mining districts of Waterberg and Sekhukhune (38.5% and 24.9% of the backlog respectively) and can be linked to the higher demand for rental housing.

The trends and profile of backyarders across the Province have not been defined as yet and therefore adequate responses and policy direction are not yet evident. Notably informal rental is a vitally important housing sub-market in the Province and offers a critical source of accommodation for low-income and middle-income households.

Table 9: Provincial and district dwelling types per category, 2016

Province or district municipality	Adequate dwellings		Inadequate dwellings								Other/not applicable	
			Total inadequate dwellings		Traditional dwellings		Informal dwellings		Other			
	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total
Limpopo	1,423,522	88.9%	159,625	10.0%	81,746	5.1%	77,371	4.8%	508	0.0%	17,934	1.1%
Capricorn	352,644	93.2%	19,278	5.1%	5,974	1.6%	13,208	3.5%	96	0.0%	6,379	1.7%
Mopani	306,820	90.7%	27,772	8.2%	20,357	6.0%	7,310	2.2%	105	0.0%	3,839	1.1%
Sekhukhune	254,468	87.6%	32,186	11.1%	14,351	4.9%	17,739	6.1%	96	0.0%	3,875	1.3%
Vhembe	329,885	86.3%	50,172	13.1%	39,276	10.3%	10,844	2.8%	52	0.0%	2,301	0.6%
Waterberg	179,710	85.0%	30,216	14.3%	1,788	0.8%	28,269	13.4%	159	0.1%	1,543	0.7%

Source: StatsSA, Community Survey 2016; Limpopo MYHSDP 2019–2024

In anticipation of the StatsSA census data to be released in 2023, the most recent source of data to show trends in the occurrence of informal dwelling types is the CSIR's analysis of the GTI spatial data building based land use (BBLU) 2022 of *Residential structures: Informal*. The figures for informal residential structures are summarised in **Error! Reference source not found.** Table 10 and illustrated in Figure 36. The informal residential structure estimates include all informal housing structures and multiple informal units.

The trend for Limpopo indicates a rise in informal residential structures from 117,153 to 125,777 between 2015 and 2020. This represents an increase of 8,624 informal residential structures over the same period.

The 125,777 informal residential structures in 2020 correlate with the estimated provincial housing backlog of 124,849 households residing in inadequate dwellings estimated in the MYHSDP 2019–2024 for 2019. The provincial housing backlog in 2020 can therefore be estimated at 125,777 households.

Table 10: Provincial and district informal residential structure count, 2015 and 2020

Area	Informal residential structure count		Growth in number	Percentage change
	2015	2020	2015–2020	2015–2020
Limpopo	117,153	125,777	8,624	7.36%
Capricorn	29,560	31,619	2,059	6.97%
Mopani	17,493	18,469	976	5.58%
Sekhukhune	14,042	14,384	342	2.44%
Vhembe	11,543	12,521	978	8.47%
Waterberg	44,515	48,784	4,269	9.59%

Source: CSIR 2022 GTI building data: Residential structures, Informal.

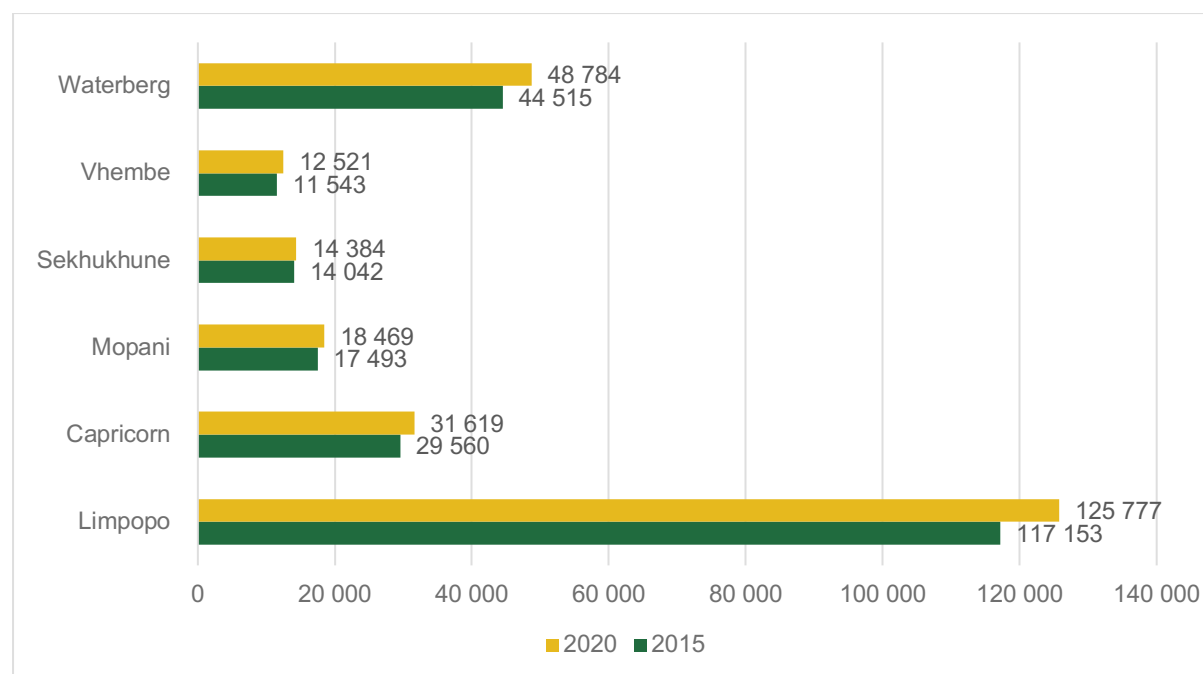


Figure 36: Provincial and district informal residential structure count, 2015 and 2020

Source: CSIR 2022 GTI building data: Residential structures, Informal

The district that experienced the largest increase in informal residential structures over the same period is Waterberg, where 4,269 structures were estimated, followed by the Capricorn district (2,059).

A kernel density map was developed in Figure 37 to show the spatial concentration of informal residential structure growth between 2015 and 2022. The structure growth in the Waterberg district highlights (in red) Northam and Modimolle as the two areas with the largest concentrations of growth in informal dwelling types, followed by Lephalale and Bela-Bela. High concentrations of informal residential structure growth are also evident in the Polokwane-Seshego urban complex, and at Nkowankowa/Lenyenye.

It is also observed that the growth in informal residential structures is found in provincial growth points and, to a lesser extent, in traditional areas.

Some communities staying in informal structures were noted on farms in the Vhembe district (south of the Limpopo River and west of Makhado).

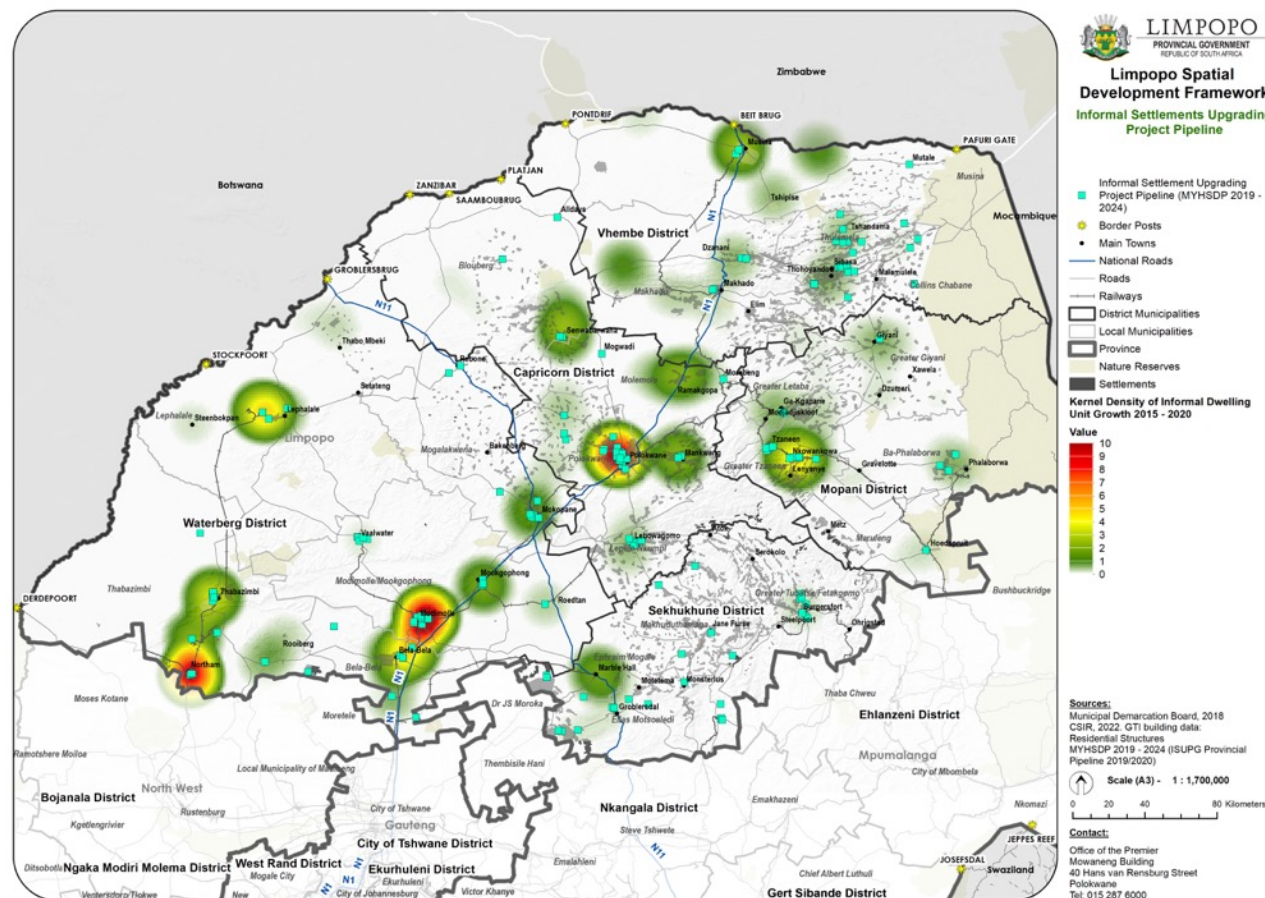


Figure 37: Kernel density analysis of growth in informal residential structures 2015–2020

Whilst the previous map shows the concentration of growth in informal residential structures, the kernel density map in Figure 38 shows the concentration of all informal residential structures in 2020. Clearly, large concentrations of informal structures have been in existence since 2015 or earlier over wide areas of the province. The concentration of informal structures not only show vulnerable households, but also show areas with development pressure.

Figure 38 also shows the occurrence of informal residential structures mainly in concentrated areas across the province, except in Mopani and Vhembe regions where a wider or larger spatial footprint are found.

The larger concentrations of informal structures are found in the main formal towns of the province such as Polokwane, Mankweng, Mokopane, Tzaneen/Nkowankowa/Lenyenye, Phalaborwa, Modimolle, Northam/Thabazimbi, Lephalale and Burgersfort. Notable concentrations are also found in Musina, Senwabarwana, Dennilton, Monsterlus, Ga-Kgapane, Giyani, Thohoyandou, Malamulele, Mookgophong and Vaalwater.

The trend is also for informal settlements to establish within or on outskirts of formal towns mostly on municipal or state owned land. The informal areas within urban edges become part of the pipeline for upgrading or relocation responses. Residential structures tend to remain longer an informal dwelling, or expand with a backyard dwelling. On the other hand, the informal structures in traditional areas establish on a newly demarcated site an informal dwelling

structure, but the structure is incrementally upgraded as household finance is available. These areas are mostly outside of urban edges and not part of the pipeline for informal settlement upgrading, but become part of the pipeline or backlog for service provision.

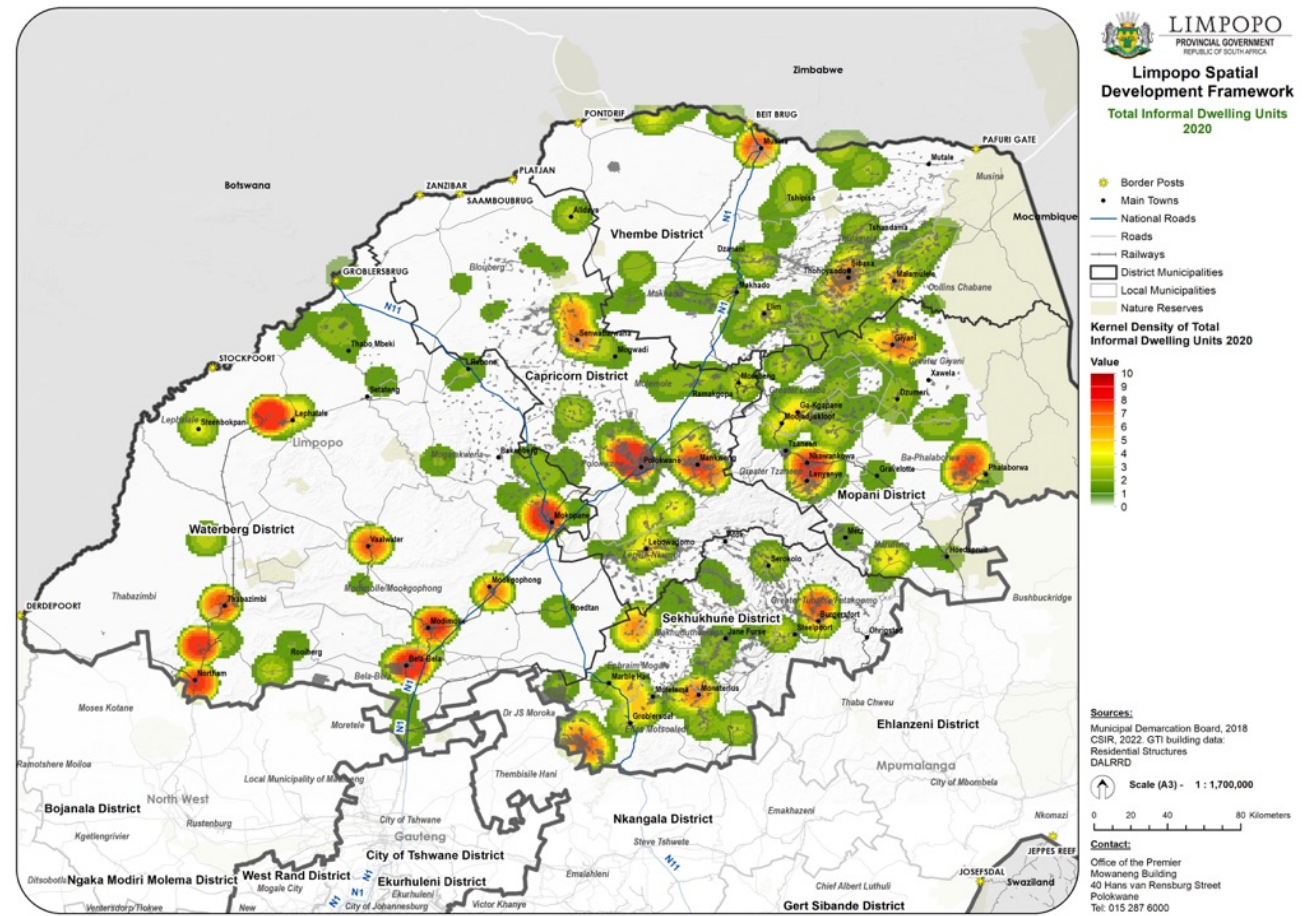


Figure 38: Kernel density analysis of informal residential structures 2020

On a municipal level, the total informal residential structures for 2020 are indicated in Figure 39, and its correlation to main towns, mining activity and the existing pipeline for upgrading of informal settlements.

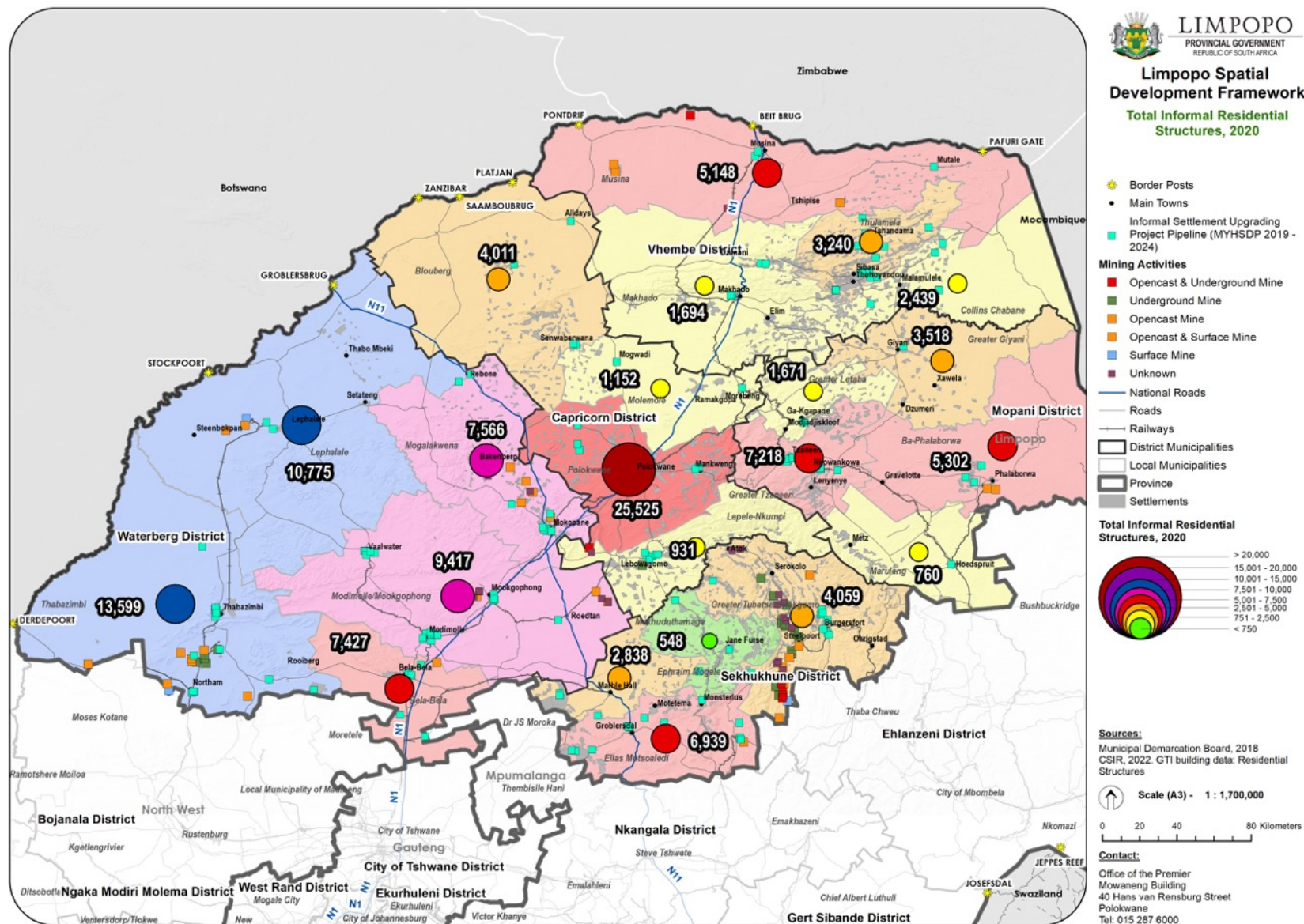


Figure 39: Informal residential structures per local municipality 2020

4.2.2.2 Informal settlements upgrading

Originally, 80 informal settlements were identified in Limpopo and formed a pipeline for the upgrading of informal settlements. The National Upgrading Support Programme (NUSP) provided technical support to the Limpopo provincial government (COGHSTA) between 2012 and 2015 with the assessment and categorisation of the identified informal settlements, as well as enumerations in certain instances. Since 2014/2015, four of these informal settlements were formalised through township establishment (IRDP):

- Polokwane X78 (Disteneng), Polokwane
- Leseding Extensions 3, 5 and 6 /Phagameng X13, Modimolle-Mookgophong
- Dan Extension 2, Greater Tzaneen
- Homo 14C, Greater Giyani

Upgrading or incremental upgrading processes are also underway at informal settlements such as Vingerkraal in the Bela-Bela municipality, Masakaneng in the Elias Motsoaledi municipality and Raphuti and Smashblock in the Thabazimbi municipality.

The challenges that the province is facing with the upgrading of informal settlements centre around the release of state land, bulk infrastructure capacity constraints and a lack of upgrading or relocation plans per settlement.

As a result, since 2015, provincial responses to informal settlements were focused on land release, feasibility studies and township establishment processes. In the mining towns of Lephalale, Burgersfort and Groblersdal, the efforts were directed to the upgrading and supply of bulk infrastructure.

The Informal Settlements Upgrading Partnership Grant (ISUPG) was introduced in 2019/2020. In response to the preparation for the grant framework, upgrading plans of the informal settlements upgrading projects in the pipeline were undertaken in 2020/2021, and a review of the Limpopo Provincial Informal Settlement Upgrading Strategy was completed in 2019.

The focus of the ISUPG in the province will be on Phase 2 and advancing to Phase 3 of the upgrading process.

According to the MYHSDP 2019–2024, there are 76 informal settlements in the provincial pipeline (2020). The MYHSDP has annexed the list of informal settlements identified, the NUSP category, number of units, level of service and status.

The spatial locality of the informal settlements in the provincial pipeline is shown in Figure 40 in comparison to the promulgated PSHDAs. The same figure shows the NUSP upgrading response and the location of the settlements in respect of the prioritised municipalities under the Revitalisation of Distressed Mining Communities Programme.

Twenty-one informal settlements were recommended for relocation or partial relocation. Most of the informal settlements are located in the spatial targeting areas, except for Vingerkraal and Ga Masha.

There are correlations between the spatial location of informal settlements and the distribution of mining and related industrial activities. This trend is prominent in Lephalale, Thabazimbi, Northam, north of Mokopane and in the Sekhukhune district. Urbanisation is also evident, with a correlation between informal settlement growth and provincial growth points.

In Figure 37, the pipeline is shown in comparison to the CSIR's 2022 analysis of the GTI spatial data of BBLU informal residential structure growth, 2015–2020. Through the spatial analysis, the above-mentioned trends were indicated yet again. It also became apparent that commercial rural activities, as well as cross-border activities at Beitbridge, are triggers for informal occupation of land.

There is an increasing number of settlements that are established informally along urban edges. These informal areas are often identified by municipalities for upgrading support or serviced stands. The challenge is that if a settlement is located outside of the urban edge, it is excluded from the UISP. In certain instances, the characteristics of settlements within and outside of the urban edge is the same, but the urban edge boundary restricts the upgrading support available. This situation continues to challenge the definition of informal settlements in the Housing Code, which reflects bias

towards delineated urban areas. It also challenges the approach to delineate urban edges. This issue relates to the rural densification discussed in section 4.1.3.3.

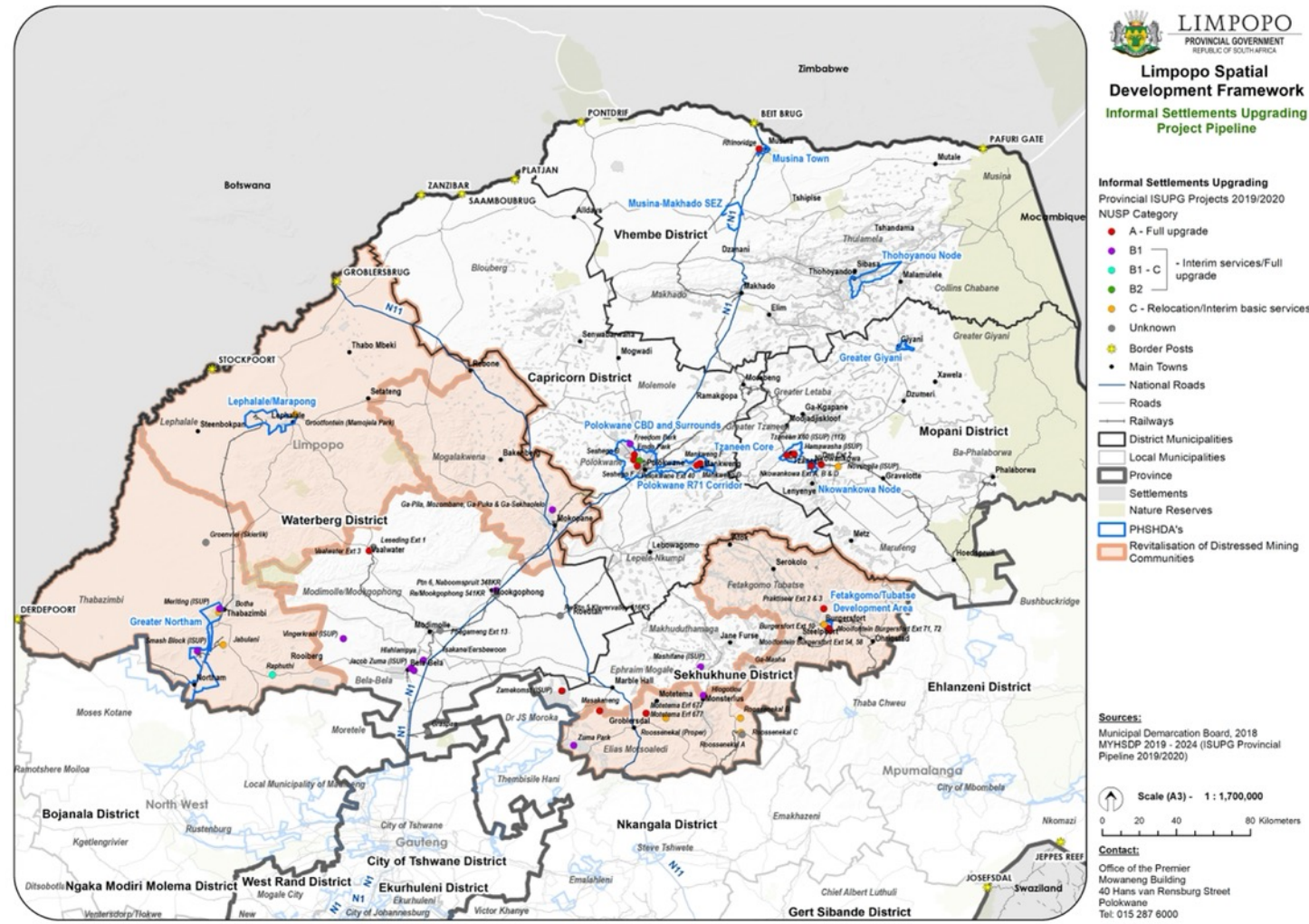


Figure 40: Limpopo informal settlements upgrading project pipeline 2019/2020

Source: Limpopo MYHSDP 2019–2024

4.2.2.3 Household tenure

The StatsSA Community Survey 2016 is the source with the latest figures on the tenure status of households in the province and its districts. In 2016, as shown in Figure 41, 71.9% of households in the province owned their residence. Of those, 64.7% had paid off their residence, while 7.1% had not yet done so. Since 2011, when the StatsSA Census was released, the overall tenure trend marked across the province is a positive increase in home ownership.

In 2016, 9.7% households in the province rented their residence. On provincial scale, the number of households that are renting has decreased from 2011 to 2016, but the number of households renting in the Waterberg district increased over the same period (by 33.3%). The percentage of households renting in the Waterberg district (17.8%) is notably higher than that of the provincial average (9.7%). This trend can be attributed to the mining and energy generation industries in the district.

Despite positive progress made, it is still necessary to fast-track the three programmes that collectively secure tenure: the Enhanced Expanded Discount Benefit Scheme (EEDBS) (pre-1994), the Title Restoration Programme (post-1994) and the new subsidies (IRDP).

According to the MYHSDP 2019-2024, the estimated backlog or baseline for the registrations of title deeds pre-1994 and post-1994 in Limpopo was 42,174 in 2014. A total of 18,601 properties were transferred to beneficiaries between 2014 and 2019 in respect of new houses, rectification (EEDBS), title restoration and tenure upgrading.

The National Department of Human Settlements introduced a new conditional grant, the Title Deeds Restoration Grant, in 2018/2019 with the purpose to fast-track and eradicate the backlog in the registration of title deeds. The Title Restoration Programme was intended to run for three years. However, the implementation of this programme has faced a number of challenges. Apart from the delays caused by the COVID-19 pandemic (offices closed, Municipal Planning Tribunals not operational), the release of state land or blocked planning processes are hindering the registration of title deeds in certain historical townships such as Malamulele, Nkowankowa,

Lenyenye and Marapong Extension 3 (state land release) and the completion of township establishment processes for Elandsdraal-A, Dendron Extension 4, and Phagameng Extensions 11 and 12.

A further issue is that the actual backlog in title restorations proved not to include all areas and the scope provided by local municipalities, not inclusive of all requirements and steps to proclaim townships. The record of planning processes completed on historical townships is a challenge that hinders adequate governance of the land.

Security of tenure is a key national outcome towards asset creation. As such, investments in the spatial targeted human settlements programmes are aimed at improving household tenure. The PSHDA development plans have identified land to be developed or assembled to help improve tenure security.

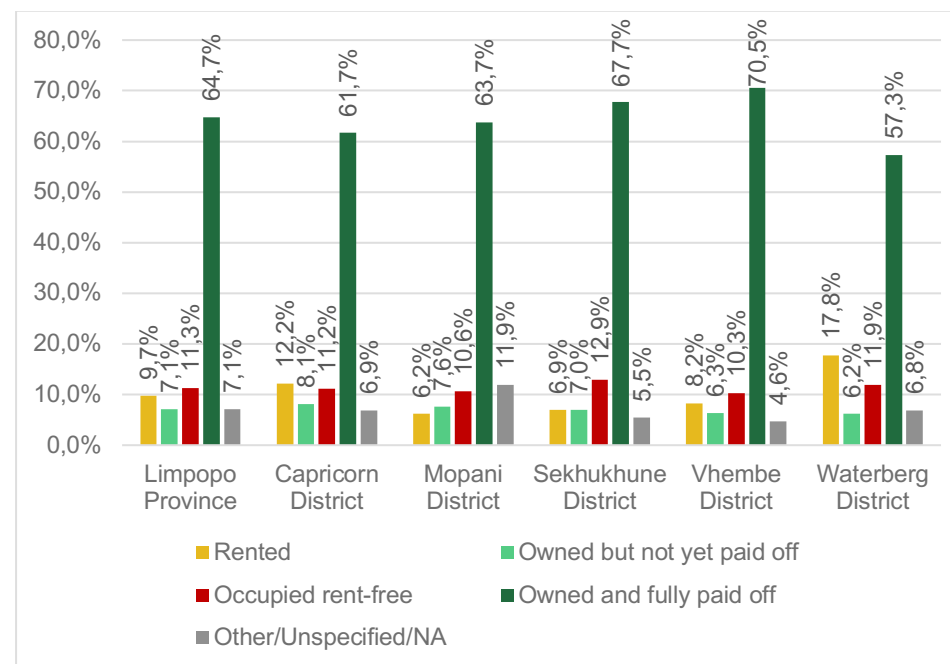


Figure 41: Provincial and district household tenure status, 2016

Source: StatsSA, Census 2016

4.2.2.4 Estimated housing demand and pipeline

The 2019 - 2024 housing demand for Limpopo Province is estimated at 307,844 households in the Limpopo MYHSDP 2019-2024. The demand comprises of a housing targeted backlog of 104,779 and a household increase estimated at 203,065 over the said period. The targeted backlog refers to the component of households residing in inadequate dwelling units that can potentially benefit from housing subsidies such as South African citizens in the low income and gap market.

The housing demand per income group is based on the 2001 StatsSA Census as the latest official figures. In 2011, 76% of the provincial households were in the low income bracket earning between R0 and R 3,200; 21% were middle income households earning between R3,201 and R25,000, and the remaining 3% high income households. Due to the outdated figures, it is recommended to redetermine the housing demand according to income segments and more accurate household growth estimates, upon release of the new StatsSA census in 2023.

The housing demand is to be provided through a range of housing opportunities and options such as the finance linked individual subsidy programme (FLISP), social and rental housing, upgrading of informal settlements programme, integrated residential development programmes and the enhanced peoples housing process

(EPHP). 81% of the housing opportunities is planned in spatial targeting areas and urban areas, and 19% as rural interventions, focussing on the vulnerable rural households. The urban project pipeline and upgrading of informal settlement pipeline are showed in Figure 42.

Due to the trends that emerged such as households improving their dwellings incrementally to adequate houses, the housing interventions in the province can be directed to support these households through provision of serviced stands, EPHP and improving access to housing finance such as access to FLISP.

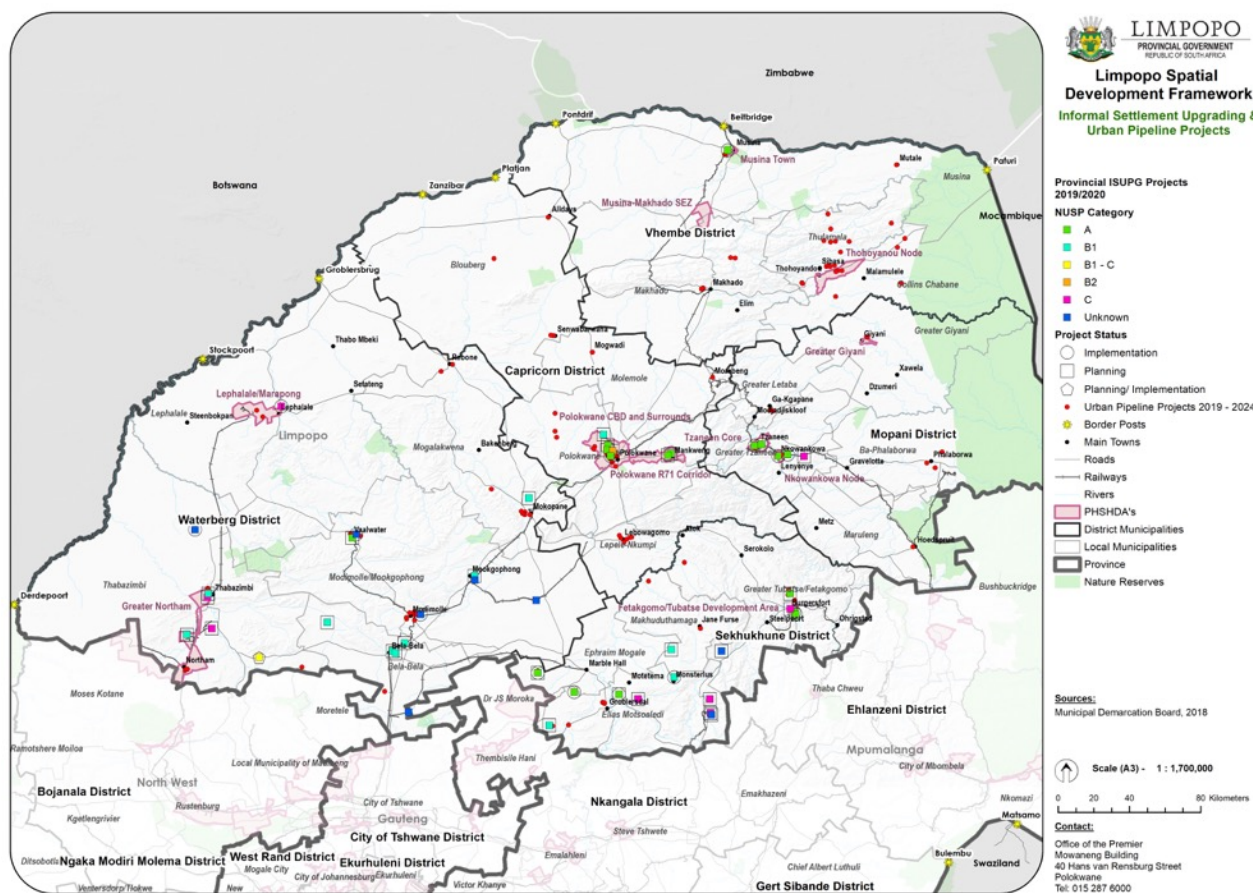


Figure 42: Human settlements pipeline

4.2.2.5 Priority human settlements and housing development areas

As pointed in the previous phase (refer to Section 2.3.8.1 of the Phase 1 report dated 1 December 2022):

[T]he Human Settlements Framework for Spatial Transformation and Consolidation 2019, was developed having realised that the spatial location of human settlements investments did not necessarily achieve integration, and that a far more aggressive and accelerated intervention is required to reverse the spatial distortions. The framework is set to achieve the optimum results of spatial transformation. It aims to direct investment in, and development spending on, national space, to enable inclusive growth and sustainable livelihoods by outlining a package of interventions towards asset poverty alleviation and housing delivery in well-located areas with secure tenure.

In response to the Framework, eleven Priority Human Settlements and Housing Development Areas (PHSHDAs) were declared and promulgated on 15 May 2020. The delineated PHSHDAs are depicted in Figure 43.

Following the promulgation of the PHSHDAs, draft development plans with integrated implementation programmes were developed

for each PHSHDA and the process to secure inputs from the stakeholders and local municipalities is underway. The Tzaneen and Nkowankowa PHSHDAs are not yet completed with the draft plans.

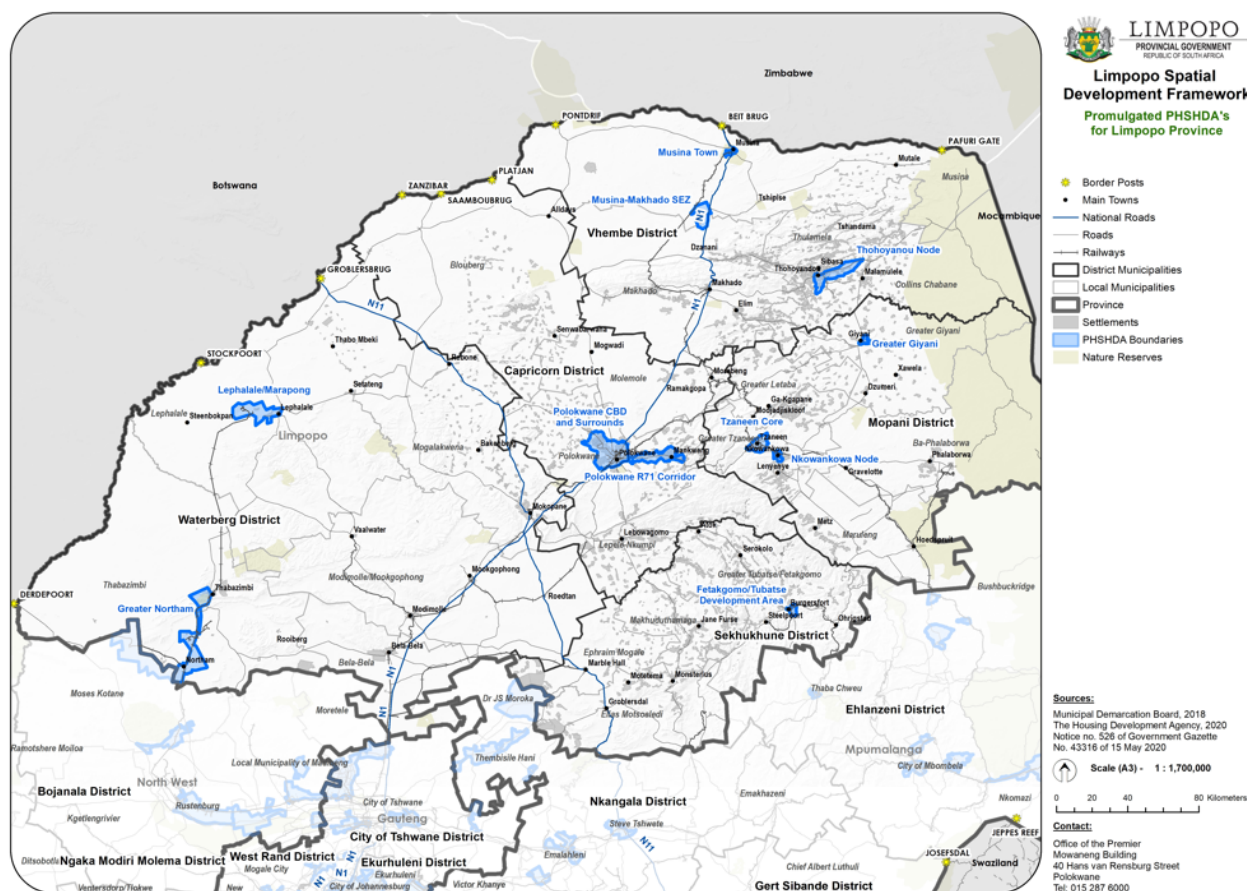


Figure 43: Limpopo PHSHDAs

Table 11: Housing yield and land assembly in Limpopo PSHDAs

District municipality	Local Municipality	PSHDA		Total area of land (ha)	Land release required (ha)	Housing yield/ number of units/opportunities			
		Number	Name			Total	Low density	Medium density	High density
Capricorn	Polokwane	1 & 2	Polokwane CBD and surrounds & R71 Corridor	2,816.00	235.00	66,580	16,700	49,880	
Mopani	Greater Giyani	3	Greater Giyani	515.49		8,172	4,187	226	3,759
Mopani	Greater Tzaneen	4	Nkowankowa Node			⁴ Not available			
Mopani	Greater Tzaneen	5	Tzaneen Core			Not available			
Sekhukhune	Fetakgomo Tubatse	6	Fetakgomo/Tubatse Development Area	257.55	23.05	9,220	2,552	3,908	2,760
Vhembe	Musina/Makhado	7	Musina-Makhado SEZ	60.85		2,110	280	1,070	760
Vhembe	Musina	8	Musina Town	221.60	88.20	8,504	60	6,464	1,980
Vhembe	Thulamela	9	Thohoyandou Node	614.25	452.00	11,210	5,600	2,000	3,610
Waterberg	Lephalale	10	Lephalale/Marapong	838.00	146.00	20,176		12,388	7,788
Waterberg	Thabazimbi	11	Greater Northam	473.63	130.60	6,580	1,220	3,680	1,680
Total				5,797.37	1,074.85	132,552	30,599	79,616	22,337

Source: Calculated from Housing Development Agency, 2022 Draft PSHDA development plans

According to the draft PSHDA development plans, the proposed number of housing opportunities to be accommodated in the eleven PSHDAs amount to 132,552 on an area of 5,797 ha (refer to Table 11). The two PSHDAs in Polokwane will include the highest number of housing

opportunities (66,580). Detailed calculations of housing yields for the two PSHDAs in Greater Tzaneen were not yet available.

⁴ Detailed calculations for the housing yields for the PSHDA were not available and will change the situation once available.

The PSHDAs incorporate the national human settlements catalytic projects of Bendor Extension 100 in the City of Polokwane and Altoostyd/ Marapong Integrated Human Settlements in the Lephalale municipality.

The provincial priority housing projects are also included in the PSHDAs except for Warmbaths Extension 25, Bela-Bela and Mogalakwena Extension 20, Mokopane

The provincial priority projects led by the province are:

- Makgathoville (Polokwane extensions 121 and 86), City of Polokwane
- Ivypark Extension 35, City of Polokwane
- Annadale Social Housing, City of Polokwane
- Warmbaths Extension 25, Bela-Bela
- Mogalakwena Extension 20, Mokopane

Although certain PSHDA boundaries extend beyond SDF urban edges, the proposals in the PSHDA development plan align with the development areas mentioned in the municipality's SDF. Some improvement in alignment is required in respect of the Fetakgomo/Tubatse Development Area and the municipal SDF.

Alignment with development plans and integrated implementation programmes is also required with the PSHDAs in the adjoining provinces of Northwest and Mpumalanga.

One of the interventions prioritised for delivery in the PSHDAs, is social housing. Social housing restructuring zones were promulgated by the

Minister for the City of Polokwane on 26 April 2017. The restructuring zones include the CBD of Polokwane and land parcels in Bendor, Ladanna and areas between the Polokwane CBD and Seshego.

The delineation of restructuring zones for Lephalale, Musina, Makhado, Greater Tzaneen and Fetakgomo/Tubatse and expansion of the Polokwane restructuring zone are in an advanced stage. In order to achieve the target to deliver 744 rental housing units in PSHDAs by 2024, alignment of boundaries should be ensured.

In Figure 44, an overlay is provided of residential structure growth from 2015-2020, the PSHDAs and the human settlements project pipeline of the province. Although alignment is observed in the delineation of spatial targeting areas in Polokwane, Lephalale, Tzaneen and Northam, the following areas have experienced significant household growth, but are excluded as PSHDAs:

- Jane Furse
- Senwabarwana
- Phalaborwa/Namakgale/Lulekani
- Lenyenye
- Malamulele
- Lebowakgomo
- Mokopane

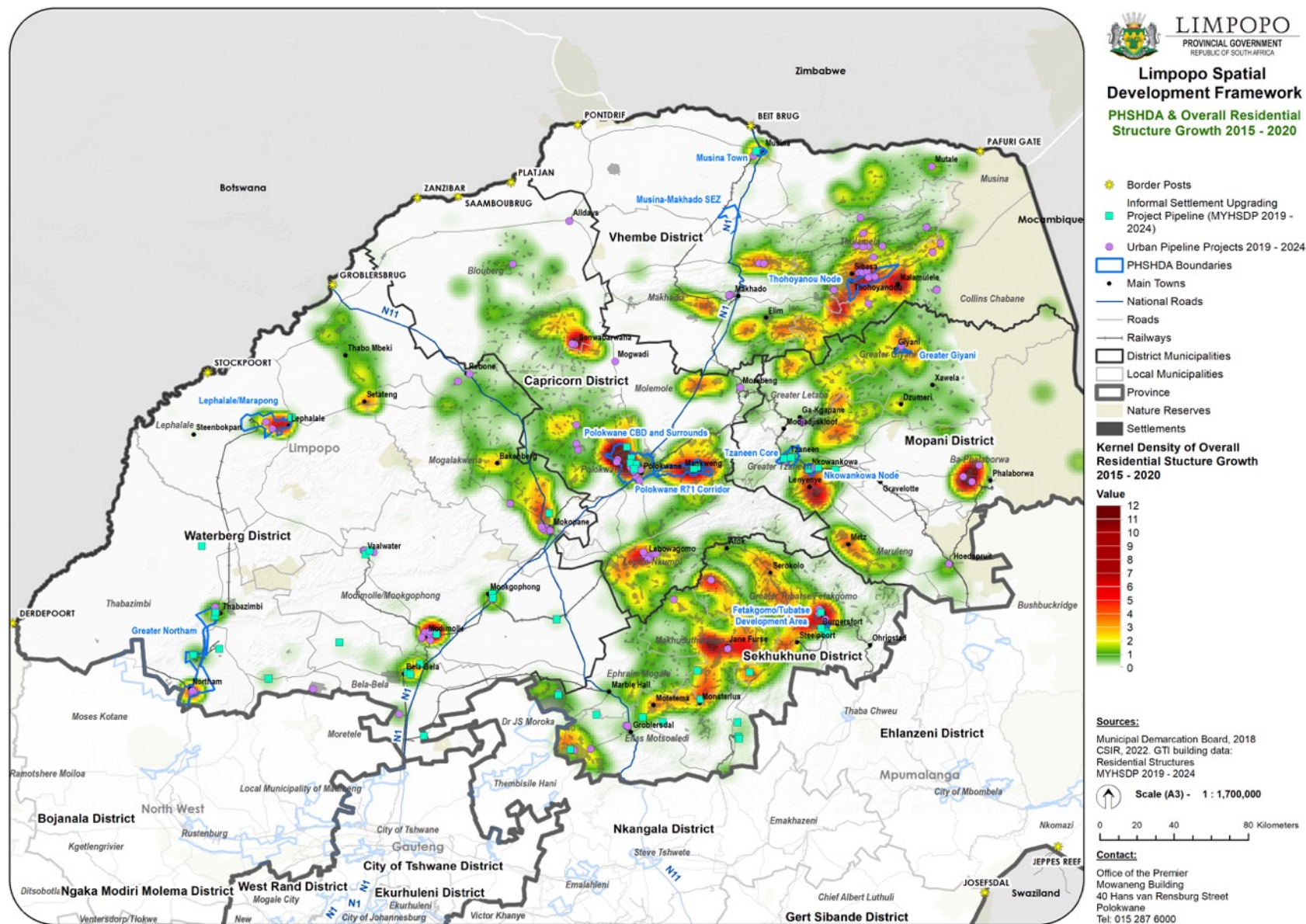


Figure 44: PHSDAs compared to provincial residential structure growth areas

4.2.3 Land provision for settlement growth

4.2.3.1 SDF land provision

Table 12 provides a summary of land earmarked by local municipalities in their municipal SDF for future residential growth and urban development. Collectively, the municipalities in the province have earmarked 101,000 ha for future development which includes strategic development areas (SDAs) and expansion areas. The SDAs in the various municipal SDFs cover a land area of 60,034 ha.

The Mopani district has earmarked the largest area of land for future extensions in the province at 29,888 ha, followed by Vhembe district at 25,580 ha. Collectively, 55% of land earmarked by municipalities for future extensions are in these two districts.

The local municipality with the largest area earmarked for future expansion is Polokwane, with an estimated 15,546 ha or 15% of the total area of the province. Despite the large size of the potential future extension areas of Polokwane, the strategic development areas that are earmarked are much smaller (4,566 ha). The Polokwane SDAs can potentially provide for approximately 40,000 residential erven. Other municipalities with large future development areas are Greater Tzaneen, Makhado, Collins Chabane.

Table 12: Municipal SDF provision of land for future residential growth

Municipality	SDF date	SDA (ha)	Expansion area (ha)	Infill development (ha)	Total (ha)	Percentage of total
Limpopo	-	60,034	36,020	4,883	100,937	100
Capricorn	-				18,335	18
Blouberg	2018		788	192	980	1
Lepelle-Nkumpi	2017	1310			1,310	1
Molemole	2019		499		499	0
Polokwane	2010	4,566	10,980		15,546	15
Mopani	-				29,888	30
Ba-Phalaborwa	2019	349			349	0
Greater Giyani	2013	765	8,338		9,103	9
Greater Letaba	2021	5,243			5,243	5
Greater Tzaneen	2017	8,609	612		9,221	9
Maruleng	2015	5972			5,972	6
Sekhukhune	-				18,393	18
Elias Motsoaledi	2018		3,686		3,686	4
Ephraim Mogale	2018	301	290		591	1
Fetakgomo Tubatse	2020	103	8,366	2,073	10,542	10
Makhuduthamaga	2021		1,552	2,022	3,574	4
Vhembe	-				25,580	25
Makhado	2011	9,545	153		9,698	10
Musina	2014		756		756	1
Collins Chabane	2017	9,725			9,725	10
Thulamela	2019	5,401			5,401	5
Waterberg	-				8,741	9
Bela-Bela	2018	1,137			1,137	1
Lephalale	2017	4,591			4,591	5
Modimolle-Mookgophong	2021	908			908	1
Mogalakwena	2017			596	596	1
Thabazimbi	2022	1,509			1,509	1

There is a lack of guidelines or criteria for the delineation of urban edges or future development areas in municipal SDFs in the province. Various terms are used and create confusion amongst land developers.

4.2.3.2 Land availability and assembly

A critical development challenge in the province is the lack of available, suitable and well-located land for development and in particular human settlements development purposes. Various of the urban areas in the province are regarded as land locked. The Limpopo Department of Co-operative Governance, Human Settlements and Traditional Affairs with support from the Housing Development Agency, has developed a land assembly pipeline for the province and supports municipalities with the release and assembly of well-located land. The priority areas for land assembly are indicated in Table 13 and clearly show the need across the province.

Table 13: Priority areas for land assembly

Category 1 Immediate acquisition required	Category 2 Acquisition within near future (3 years)	Category 3 Release of State-owned land
FetakgomoTubatse Elias Motsoaledi Thabazimbi Maruleng Greater Giyani	Polokwane Greater Tzaneen Lephalale Musina Makhado	Ephraim Mogale Thulamela Collins Chabane Modimolle Greater Letaba Blouberg Bela-Bela Makhuduthamaga Mogalakwena Lepelle-Nkumpi Ba-Phalaborwa Molemole

Source: Limpopo MYHSDP 2019-2024

The province has since 2007 acquired 1,292 hectares of privately-owned land (9 development areas) and 1,916.484 hectares were released by the State (9 development areas) in Polokwane, Lephalale, Burgersfort, Groblersdal, Jane Furse, Tzaneen and Thabo Mbeki (Limpopo CoGHSTA, 2020). The development of the land has been slow due to bulk infrastructure challenges and approval of social housing restructuring zones.

The promulgation of PHSHDAs puts a stronger focus on prioritisation of land acquisition within PHSHDAs and for this purpose, the prioritisation criteria of the pipeline need to accommodate spatial targeting.

The PHSHDA draft development plans identified 1,074.85 ha of land to be released in the PHSHDAs (refer to Table 11).

The need for land is again emphasised in these spatial targeting areas and a critical factor to realise spatial transformation. All PHSHDAs are in need of land acquisition except Giyani and the Musina-Makhado SEZ southern site.

The cumbersome processes for the release of state land have been a continuous challenge in making undeveloped and vacant state land available within urban edges, or to release land invaded. Due to the slow processes to release land and create service stands, invasion of state land has been occurring around various urban areas. There is an intervention required to fast-track the release of state of land within PHSHDAs and land locked urban areas to prevent further land invasion and indiscriminate development.

4.2.3.3 Correlation between national incentives and local provision for future settlement growth

This section contains a comparison of the priority human settlement and housing development areas (PHSHDAs) and those areas earmarked by local municipalities as strategic development areas to assess alignment.

Polokwane and Mankweng

The PHSHDAs mainly align with the areas demarcated by the municipality as strategic development areas. The focus is on the areas between the city of Polokwane, Seshego and Mankweng.

Burgersfort/Tubatse

The Fetakgomo Tubatse PHSHDA includes three focus areas, two of which are located in Burgersfort. Although there is overlap between the PHSHDA and some of the areas earmarked in the SDF as future development or

residential development areas, there are some discrepancies in boundaries that need to be considered during review processes.

Musina and Makhado

There are PSHDAs not for the town Makhado specifically but for the proposed Musina–Makhado SEZ. The proposals outlined in the PSHDA development plan align with the regional SDF for the area.

Musina

The town Musina includes three focus areas in the PSHDA development plan. The areas largely align with the municipality's SDF proposals, especially for future extension areas.

Tzaneen and Nkowankowa/Lenyenye

The PSHDA development plan was still in process to be completed at the time of the assessment. The draft information available in respect of the PSHDA development plan show alignment to the municipal SDF.

Lephalale

The PSHDA aligns with the areas demarcated by the municipality as areas for residential infill development and integration areas development areas, with the focus on Ellisras, Onverwacht, Altoostyd and Marapong and areas between (integration area).

Thohoyandou

Three of the PSHDAs are located in the Thohoyandou settlement area: the Thohoyandou CBD, Thohoyandou J, and the Thohoyandou L and Nandoni dam area. Most areas of the PSHDAs align with the urban edges set out in the municipal SDF.

Thabazimbi

Although this section is focused only on Thabazimbi, the PSHDA includes three areas: Thabazimbi, Northam and Amandelbult located between the former two towns. The proposals in the PSHDA align with the development areas mentioned in the municipality's SDF.

In respect of Thabazimbi, the development plan proposals focus on the Regorogile area.

Giyani

The municipal SDF was compiled in 2013, and should be reviewed, but the proposals for the PSHDA align with the SDF and are focused on the town Giyani.

4.2.4 Smart cities

4.2.4.1 Introduction to and guidelines for smart cities

A smart cities framework (SCF) dated March 2021 was developed by the Department of Cooperative Governance in collaboration with the Council for Scientific and Industrial Research (Dept Cooperative Governance, 2021) to guide decision-making and provide all role players with a structured approach to identifying, planning and implementing smart city initiatives that are appropriate to the local context.

The document quotes various definitions for a smart city, and explains an inclusive interpretation of the terms. The quote in the SCF most relevant for this analysis is by the United Nations, which defines a smart city as follows:

"A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental aspects."

The framework stresses that smart cities should be based on the notion of inclusivity and must be informed by, and respond to, local conditions. This means that a smart city initiative should ultimately benefit all people and all communities in the city and help improve the well-being of the entire city.

For a city to be smart and inclusive, it should adhere to six interdependent principles. Those principles provide guidance when decisions must be made

regarding the identification, planning and implementation of smart initiatives and technologies:

- It should be smart for all.
- It should use technology as an enabler rather than a driver.
- It should be shaped by, and respond to, the local context.
- It should be informed by the real needs of the community.
- It should embrace innovation, partnerships and collaboration.
- It should be sustainable, resilient and safe.

There are many aspects to consider when a smart city initiative is established. Choices may need to be made regarding the focus of a smart city initiative. For instance, the initiative could be focused on a particular theme or aspect of the city. The focus could be on becoming a connected city by, for example, providing free Wi-Fi to all communities, or on becoming a 'green' city by, for example, limiting greenhouse gas emissions through an upgraded and smart transportation system. In choosing a theme, aspects that need to be considered include the availability of capacity, resources, and capabilities to implement and maintain such an initiative.

The smart city initiatives (in African cities and towns) are generally grouped under the following categories:

Box 3: Categories of smart city initiatives

- **Smart economy:** This category is focused on interventions that are aimed at boosting economic development through the establishment or enhancement of, for example, tech hubs and incubators that support innovation, new tech, skills development and creative enterprises. Initiatives under a smart economy may also include the development of new cities/precincts as a way of attracting investments.
- **Smart mobility:** The focus is on enhancing the reliability, convenience and efficiency of traditional transport through the use of big data, machine learning and sensors.
- **Smart environment:** This category deals with better ways of managing environmental sustainability through, for example, retrofitting buildings for energy efficiency and generation, and the use of smart meters to monitor power and water usage.

- **Smart people:** The “softer” aspect of smart cities where ICT-based technologies are used as a means of engagement. The initiatives under this category commonly include the use of social media to communicate with city authorities, the collection and sharing of information, and consultative processes to improve city efficiency and co-develop city interventions.
- **Smart living:** The focus is on improving overall city liveability. Initiatives under this category may include access to public Wi-Fi, the use of surveillance with machine learning to reduce crime, improved walkability, and leisure and fitness facilities in public open spaces.
- **Smart governance:** Technology is used to support decision-making and democratic processes to deliver improved services to the public. The technology used includes, for example, e-governance systems, electronic voting and polling systems.

The SCF (Dept Cooperative Governance, 2021) provides a decision-making framework that outlines the steps in assessing the smart-readiness of a city. This framework provides municipalities and other role players with guidance on the planning of smart cities.

4.2.4.2 Smart cities for Limpopo

The Limpopo Development Plan (LDP) (Limpopo OTP, 2020) proposes the following nodes to be prioritised or developed as smart cities in the province:

- Polokwane
- Tzaneen
- Musina
- Lephalale

The LDP further states that “[t]his does not mean that ‘smart’ solutions may not be implemented elsewhere, but there is a need for an integrated approach in the above four cities”.

Other private-sector initiatives, such as the Nkuna smart city initiative, are also underway in the province.

Polokwane smart city

The Polokwane Municipality adopted a model of smart city governance or smart administration and uses technology to manage their systems rather than to identify a specific “place” for a smart city greenfields development.

In 2017, the Polokwane Municipality announced the following:

The municipality's Smart City vision articulates the future development path of the City of Polokwane. Consistent with the 2030 Smart City Vision, the city launched six pillars that will assist the municipality to work towards the realization of becoming a Smart City that embraces Smart Living and Smart People as some of its building pillars. This Smart City concept is carried within the city's vision to be the “The ultimate in innovation and sustainable development”. (Polokwane Municipality, 2017)

The Municipality's mission is to provide cost-effective services that promote sustainable livelihoods through socio-economic development and good governance.

The Polokwane Municipality IDP (Polokwane Municipality, 2022) states:

The City of Polokwane has developed its long-term strategy for the next term and beyond through VISION 2030. This strategy is pegged against a long-term growth path to transform the municipality into a bustling and sustainable entity that distinguishes the Municipality as a City of stars leading in innovation through the SMART CITY concept.

It further states:

The process of planning towards 2030 has already been started from 2013/14 Financial year. Council has adopted Polokwane 20 Year Economic Growth and Development Plan (EGDP).

The main objective of the EGDP is to assist the City of Polokwane to achieve real and sustainable economic growth and development, as well as transforming and aligning the City to become a Smart City within the next 20 years. It is therefore vital that this plan set out very specific goals and implementable projects to attain the City's vision. Smart City' concept is a forward-looking plan into, Economy, People, Governance, Mobility, Environment and Space.

In their Vision-2030: Smart City, the Municipality has therefore identified six pillars to achieve this vision:

- Smart economy
- Smart environment
- Smart governance
- Smart living
- Smart mobility
- Smart people

It is evident, then, that the Polokwane Municipality's approach is based on all six categories of smart cities.

Musina/Makhado SEZ Smart City Model

The Smart City Model for the Musina-Makhado Special Economic Zone (Musina Makhado SEZ, 2021) proposes five steps to implement the Musina Makhado corridor as a smart city:

- The making of the Smart City – Integration of the northern Antonvilla
- MMSEZ with its surroundings, the Beit Bridge border and the Musina CBD
- The development of the N1 Musina Corridor
- Strategic development along the corridor
- Renew and regenerate CBDs of Musina and Makhado
- Connect the villages to become a Smart City Region

The implementation of these five steps or the model is proposed over an estimated 25 years as follows:

- 2024 – Step 1: The making of the Smart City
- 2030 – Step 2: The development of the N1 Musina Makhado Corridor
- 2035 – Step 3: Strategic development along the corridor
- 2040 – Step 4: Renew and regenerate Musina and Makhado's CBDs
- 2050 – Step 5: Connect villages to become Smart City Region.

The first step includes the development of the northern Antonvilla SEZ site located north—east of Musina town. The focus is to create investment opportunities for industrial, light manufacturing of metal products, electronics industries, food and beverage industries, wood and paper industries, packing, logistics and warehousing.

Part of the first step, the Beit Bridge border post will be transformed to be a high quality precinct and upgraded with components such as retail, gateway park truck stop, etc.

The second step is to upgrade the N1 corridor between Makhado and Beit Bridge to make the corridor a vibrant smart activity corridor. This includes development of human settlements, office parks freight facilities, shopping and leisure activities.

These two steps in terms of space utilisation, forms a triangle between Musina town, Beit Bridge and the northern Antonvilla SEZ site.

Lephalale green city

The development of Lephalale as a green city, and in particular the Joe Slovo Integrated Human Settlements Development area, forms part of the projects in the SIP1 programme.

Tzaneen smart city

At this stage, no proposals for the Tzaneen smart city or smart city governance could be found to incorporate in this report.

Nkuna smart city

The Nkuna smart city is a private greenfields initiative located on 119 ha near the Nkuzana village, between Elim and Giyani along the R578. The envisaged smart city in Collins Chabane includes a mixed-use development with residential and industrial areas, retail facilities, a hotel, and medical, educational and sport facilities (Top ongoing mega projects in South Africa, 2023).

Investment in the smart city has commenced with the development of retail facilities. It is unknown what models or categories of a Smart City are used in the development, i.e. smart economy, smart mobility, smart environment, smart people, smart living, smart governance.

4.2.5 Rural development

The NSDF, 2022 defines rural development as follows:

The process of improving the quality of life and economic well-being of people living in a rural area by *planned interventions* in (1) the *ownership and use of land* in the area, (2) the provision, maintenance and upgrading of *transport and communication infrastructure*, both in the area, and between the area and other rural and urban areas it is systemically connected to, (3) the type and intensity of *economic activities* in the area, (4) the quantity and quality of *social*, education, welfare and safety and security *services* in the area, and (5) the 'presence' and *capacity of the State* as institution in the area. (DALRRD, National Spatial Development Framework, 2022, emphasis added)

4.2.5.1 Productive rural regions

The NSDF, 2022 uses the Regional-Rural Development Model (see Figure 21) and proposes the following:

a "soft delineation" of "polycentric functional rural regions" that have (1) at least one *well-connected regional development anchor*, located both within the region, and on the national transport network to "anchor" the region as a whole in, and connect it to the national space economy, (2) social, cultural, historical, economic and cultural characteristics and *attributes that would make the development of a "functional rural region" possible over time*, and (3) the potential for *intra-regional rural-rural and rural-urban trade* between towns and villages in the region. (DALRRD, National Spatial Development Framework, 2022, emphasis added)

According to the NDP and NSDF, rural areas are one of the components or areas that require a "shift" in order to ensure a truly post-apartheid national spatial development pattern.

To evaluate the current situation in Limpopo, and ensure vertical alignment with the requirements in the NSDF for the “shift” in rural areas, the regional development anchors and district and municipal growth points in rural areas were analysed in terms of the following criteria:

- Connectivity
- Function and service
- Economic development potential

A weight was applied to each criterion according to its role or potential role in the area. The analysis was done for each of the nodal areas classified as growth points in the LSDF 2016 and as national urban nodes and regional development anchors in the NSDF 2022.

The criteria applied in the evaluation are further explained as follow:

Connectivity

To determine its level of connectivity by road, each node or settlement was evaluated in terms of its location in relation to national development corridors and provincial corridors and other strategic routes. It was considered if the node or settlement is, or can be, connected to other nodes or settlements, and if it will be able to act as a dual-purpose connection point or conduit for mutually beneficial rural–rural and urban–rural connections. The analysis of those characteristics was influenced by considerations of the road network links between the node or settlement and the rural areas or settlements that surround it.

Figure 45 depicts nodes’ connectivity to surrounding areas. Radius of 30 km and 50 km are shown. It was assumed that a radius of 50 km represents a drive time for consumers of approximately 25 to 30 minutes, whilst a radius of 30 km represents a drive time of 20 minutes or less.

Function and services

The analysis of function and services was influenced by the CSIR’s Services Wheel and settlement typology classification, which were briefly explained in Section 4.1.5.1 . The consideration was whether a node or settlement can serve as a rural service centre in the rural service delivery network and

provide quality public services to surrounding areas. The CSIR’s existing evaluation served as input.

Economic development potential

It was considered if the node or settlement can drive and support local economic development and be a catalyst for regional rural development. The analysis was influenced by economic initiatives such as the promulgated SEZs that were already underway.

Settlement contribution towards productive rural regions

Based on the evaluation, the nodal areas or settlements in Table 14 were found to have either the potential to contribute exceptionally (80–100%) towards productive rural regions and possess all the qualities required; or the potential to contribute, or it lacks the potential or qualities that are required.

Table 14: Settlement contribution towards productive rural regions

Exceptional contribution (80–100%). Possess all qualities required	Potential to contribute (60–79%)	Lack the potential or qualities to contribute (<60%)
<ul style="list-style-type: none"> ■ Polokwane ■ Mokopane ■ Tzaneen ■ Thohoyandou ■ Mankweng ■ Bela-Bela ■ Phalaborwa ■ Makhado ■ Namakgale ■ Giyani ■ Burgersfort/Tubatse ■ Musina ■ Modimolle ■ Mookgophong ■ Hoedspruit 	<ul style="list-style-type: none"> ■ Lebowakgomo ■ Groblersdal ■ Nkowankowa and Lenyenye ■ Malamulele ■ Elim ■ Driekop ■ Bakenberg ■ Lephalale ■ Thabazimbi 	<ul style="list-style-type: none"> ■ Gravelotte ■ Modjadjiskloof ■ Marble Hall ■ Atok ■ Jane Furse ■ Ga-Kgapane ■ Mogwadi ■ Morebeng ■ Senwabarwana ■ Ohrigstad ■ Steelpoort ■ Northam ■ Alldays ■ Thabo Mbeki

The outcome of the analysis should inform the spatial proposals for productive rural regions.

The results of the analysis are given in **Appendix C**.

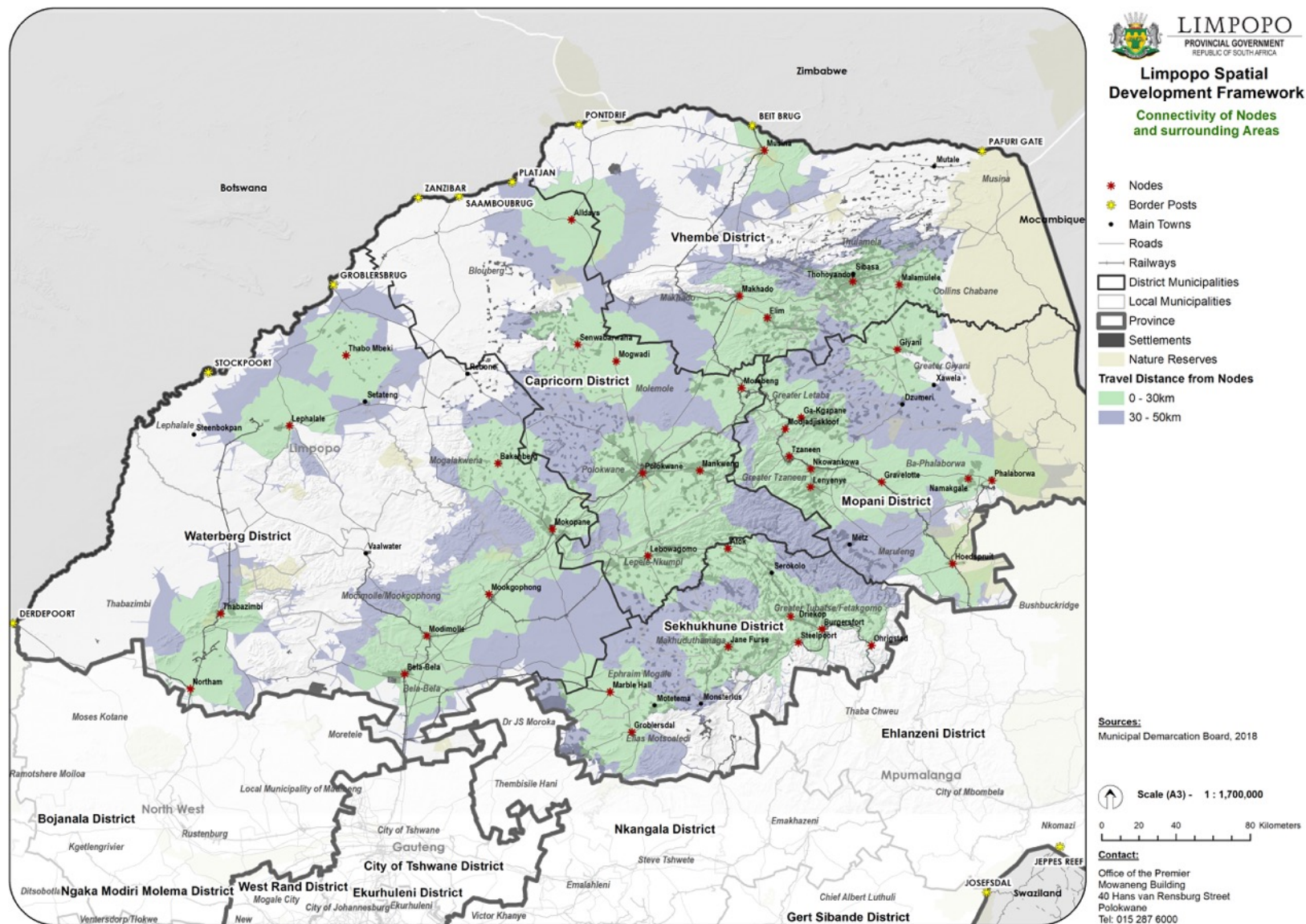


Figure 45: Connectivity of nodes and surrounding areas (rural–rural and urban–rural connections)

4.2.5.2 Rural development and land reform

Land reform

The NSDF 2022 indicates that rural areas play an important role in South Africa, despite the “deprivation gap” and results of the Apartheid system in these areas. It points out the following:

[T]hese areas become recognised as parts of our country that are (1) still “home” to millions of South Africans, many of them highly vulnerable and isolated from the broader national economy, (2) of national significance for surface water and food production and the provision of key national ecosystem services, (3) places of retreat, rest and connection with nature and cultural practices, far away from fast-paced urban lives, and (4) sought-after domestic and international tourism and retirement destinations. (DALRRD, National Spatial Development Framework, 2022)

From a spatial planning and rural development point of view, the NSDF regards the following considerations as most important:

- Targeted agrarian reform
- Tenure reform
- The development of agri-processing and logistics support hubs
- Diversification of the local economy
- Small-town redevelopment and regeneration in suitable locations
- Investment in restoring and maintaining ecological infrastructure in support of water security, food security and disaster risk reduction
- Development of the wildlife economy

The land reform programme comprises of three pillars i.e. restitution, redistribution and tenure reform. These three pillars of land reform are further described in Figure 46.



Figure 46: Government's pillars of land reform

Land reform is closely linked to the government's rural development programmes and solutions to transform rural communities, such as the Comprehensive Rural Development Programme (CRDP), Rural Development Plans and the Agri-parks Programme as discussed in Phase 1 of the LSDF.

Provincial land claims

Land claims are claims lodged in terms of the Restitution of Land Rights Act, 1994 (Act 22 of 1994) by any person or the representative of any community who is of the opinion that he or she or the community that he or she represents, is entitled to claim restitution of a right in land as contemplated in Section 121 of the Constitution.

A claim goes through different stages, including investigation by the Land Claims Commissioner, mediation, referral to and ruling of the Land Claims Court. What is important from a spatial planning point of view is the restoration of land rights.

Table 15 provides a summary of the status of land claims as at August 2021.

Finalised land restoration claims respectively account for 11.6% of the total number of land claims in Limpopo. The spatial location of the restored land was not available to map.

The Capricorn and Sekhukhune District Municipalities has the highest amount of finalised land restoration claims (192 and 565 respectively).

There is a total of 295 land claims outstanding throughout Limpopo, with the Vhembe District Municipality indicating the most at 80 outstanding land claims in total, most of which are from the Makhado Local Municipality (52).

Table 15: Summary of land claim forms and land claims per district municipality

	District municipality					Provincial total	Percentage of total
	Capricorn	Mopani	Sekhukhune	Vhembe	Waterberg		
Number of land claim forms							
Urban	669	0	7	188	197	1,061	
Rural	781	770	1,885	2,380	337	6,153	
Total number of land claim forms	1,452	770	1,892	2,568	535	7,217	
Number of land claims according to status							
Alternative remedies (finalised)	0	2	0	309	0	311	4.3
Alternative remedies (not finalised)	0	5	0	0	0	5	0.1
Court	22	35	5	20	9	91	1.3
Deferral	2	0	31	4	4	41	0.6
Dismissed	63	55	115	73	39	345	4.8
Final compensation (finalised)	1,008	535	401	1,907	312	4,163	57.7
Final compensation (not finalised)	11	9	57	17	6	100	1.4
Land restoration (finalised)	192	13	565	23	41	834	11.6
Land restoration (not finalised)	4	1	2	3	3	13	0.2
Negotiations	109	51	477	130	79	846	11.7
Phase outstanding	37	62	76	80	40	295	4.1
Research: Internal	4	2	134	2	2	144	2.0
Research: External	0	0	29	0	0	29	0.4
Total number of land claims	1,452	770	1,892	2,568	535	7,217	

Source: RLCC-Limpopo MasterData as at August 2021

Rural development plans and agri-parks

The Agri-Parks Programme forms part of the government's undertaking to review all land reform policies as enunciated in the 2011 Green Paper on Land Reform. The Agri-Parks Programme was established, amongst other things, to resolve the energy challenge and revitalise agriculture and the agro-processing value chain.

The Limpopo Revitalisation of Agriculture and Agro-processing Value Chain (RAAVC) was approved by the Provincial Government in June 2021. It relates closely to, or enhance, the agri-parks (rural development plans) as well as the Agriculture and Agro-processing Master Plan initiatives, but with a more localised focus on a list of agricultural projects.

The former DRDLR (now the Department of Agriculture, Land Reform and Rural Development) reviewed the agri-parks and drafted rural development plans in 2020 for the five districts municipalities in the province.

The proposed agri-parks for the province are shown in Table 16 and Figure 47. The agri-parks are under feasibility study and planning stages. The agri-parks programme is discussed in more detail in the LSDF Phase 1 report.

Table 16: Limpopo agri-parks (revised)

Agri-park component	Capricorn	Mopani	Sekhukhune	Vhembe	Waterberg
Agri-hub		Tzaneen	Groblersdal	Musina (Nwanwedi) Levubu Thohoyandou (Nandoni)	Modimolle
Farmer production support unit (FPSU)	Ga-Poopedi	Ga-Kgapane/Ga-Modjadji Bismark	Jane Furse Praktiseer	Mutale, Nzhelele Kruger Park	Ga-Seleka Mokopane
Rural-urban market centre (RUMC)	Lebowakgomo Polokwane Morebeng Senwabarwana	Giyani Tzaneen Phalaborwa Hoedspruit	Marble Hall Jane Furse Groblersdal Ga-Nkoana Burgersfort	Musina Louis Trichardt Thohoyandou Mutale/ Tshilamba	Thabazimbi Modimolle Bela-Bela Mokopane Lephalale

Source: (Department Rural Development and Land Reform, 2020)

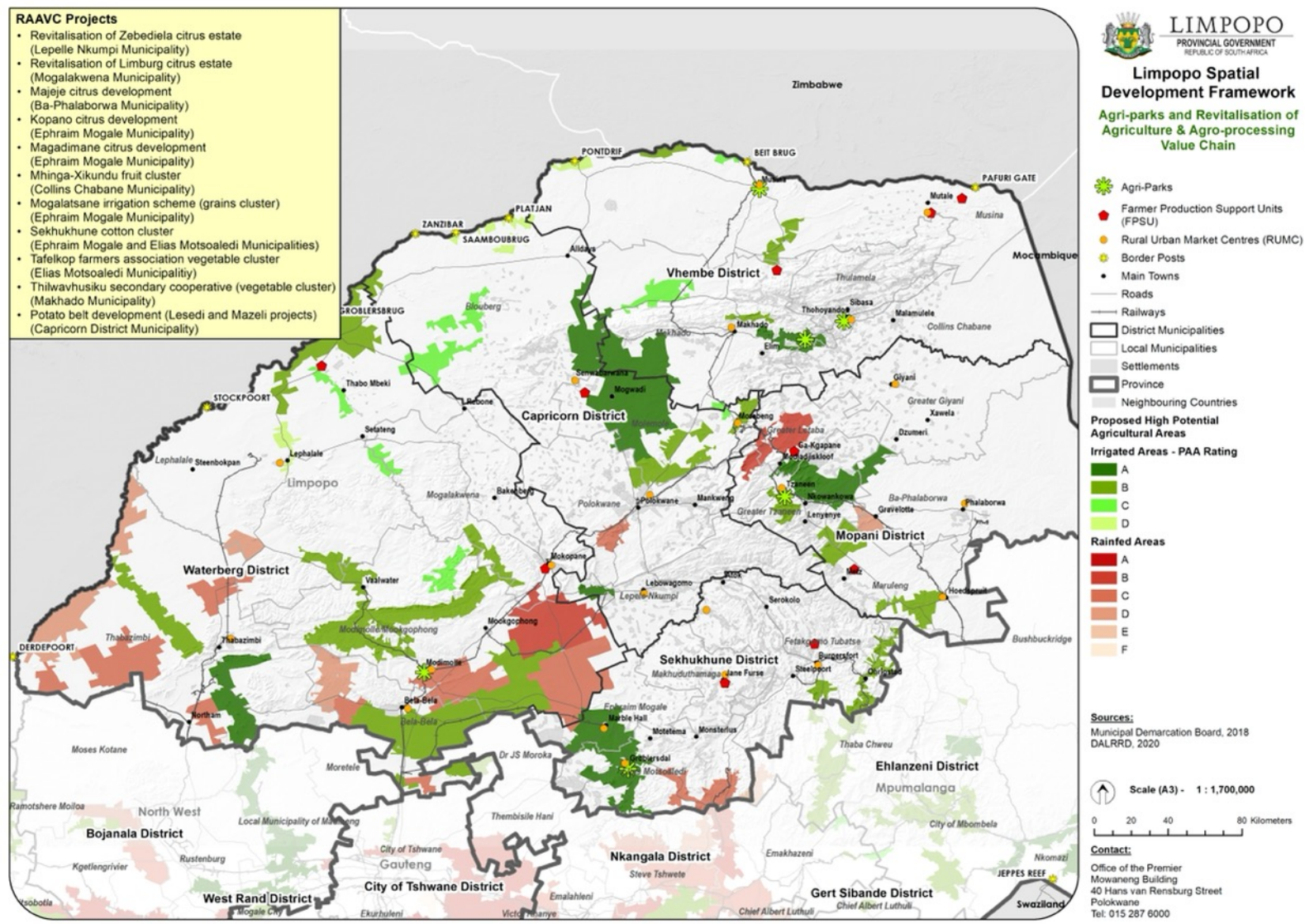


Figure 47: Limpopo agri-parks (revised)

Source: (Department Rural Development and Land Reform, 2020)

4.2.6 Social infrastructure

A core component of an integrated and sustainable human settlement and sustainable livelihood is adequate access to community facilities. From a provincial planning perspective, the focus of the analysis is on higher-order social facilities that require regional or provincial planning interventions.

The CSIR published *Guidelines for the provision of social facilities in South Africa* in 2012 and reprinted it in 2015. The guidelines contain acceptable travel distances to social facilities and average population threshold for different types of facilities. Different distances and averages apply to villages and towns of different sizes and functions. This section has applied these guidelines to assess the level of access to social services through a series of maps.

There is also a relationship between settlements' sizes and roles and the different categories of social services that would typically be associated with (and expected to be delivered by) such level of place, illustrated conceptually through the NSDF social service wheel in Figure 22.

Higher-order facilities such as hospitals, fire stations, correctional facilities and tertiary education facilities are generally located in cities and regional service centres, while clinics, schools, municipal offices and police stations are more localised in service towns or villages.

Overall, the dispersed settlement structure in Limpopo, especially in the rural areas, poses a challenge to the equitable and effective provision of social and community facilities.

A critical evaluation of the spatial distribution of the facilities in relation to economic investment and growth areas is also relevant to assess if the current facilities support the development of the skilled labour force that is required for the future needs of industry expansion.

4.2.6.1 Health and emergency services

The COVID-19 pandemic emphasised the importance of adequate access to health facilities and adequate planning for these services. According to

data from the Limpopo Department of Health 2020, there are 61 hospitals in the province, 29 health centres and 472 primary health clinics. Most of the hospitals in the province are regional and district hospitals. There is one provincial tertiary hospital in Mankweng. Each district also has specialised facilities such as long-term care, a malaria unit, a private facility, and specialised centres.

The number of hospitals, community health centres and primary health clinics in the province are summarised in Table 17.

Table 17: Limpopo number of health facilities per district

Area	Number of health facilities		
	Hospital	Community health centre	Primary health clinic
Limpopo	61	29	472
Capricorn	15	6	100
Mopani	10	9	101
Sekhukhune	7	3	89
Vhembe	11	8	118
Waterberg	18	3	64

Source: National Department of Health 2020

The current spatial distribution of hospitals, health centres and clinics in the province was assessed according to the above-mentioned CSIR guidelines. The assessment indicated that the 2021 population exceeded the average threshold for community health centres.

Hospitals

Figure 48 illustrates the spatial distribution of hospitals (Tertiary, Regional and District Hospitals) in the province based on a 30 km radius for hospitals. Most of the settlements in the province are within a 30 km radius of a hospital.

Several dispersed settlements are located beyond that radius and thus have limited access to hospitals and would require that they are within acceptable service radius of health centres and clinics.

A key constraint to the accessibility of health care in the province is the inadequate road infrastructure to hospitals. Although most of the hospitals have access to arterial roads, provincial hospitals such as the hospital at Thabo Mbeki, Metz and in Sekhukhune do not have access to major or minor arterial roads.

In the SOPA, 2023, the Premier announced the construction of the Limpopo Academic Hospital in the Polokwane local municipality between Edupark, the Northern Academy Secondary School and the N1. The hospital will provide tertiary care for the province and will be a major teaching hospital for the University of Limpopo's Faculty of Health Sciences and School of Medicine. The hospital will not only assist in improving the provision of health services in the province but also help create job and business opportunities during and after its construction.

The Premier further indicated that the installation of solar power in hospitals and clinics in the province has been prioritised to ensure that health care services will not be constrained by interruptions in electricity supply.

Community health centres and clinics

Figure 48 illustrates the spatial distribution of community health centres and clinics within a radius of 5 km of existing settlements. Numerous dispersed settlements fall beyond the 5 km radius as guideline provided by the CSIR. Additional health centres and clinics are thus required to ensure compliance with health accessibility requirements or improved mobile services.

Considering the travel distance guidelines for hospitals, health centres and clinics combined, there are 327 settlements that fall beyond the access guidelines provided by the CSIR. The dispersed settlements north of Bakenberg and Senwabarwana, as well as around Mutale and Xawela are the areas with the least access to health facilities in the province. There are also pockets of settlements without adequate access to health facilities in the Sekhukhune, as illustrated in Figure 48.

The application of travel distance to assess accessibility to services, is also highlighting the importance of roads and road conditions as enabling infrastructure. There is a clear correlation between the areas that show no or limited access, and the road conditions. These areas have mostly only access by means of local or informal gravel roads.

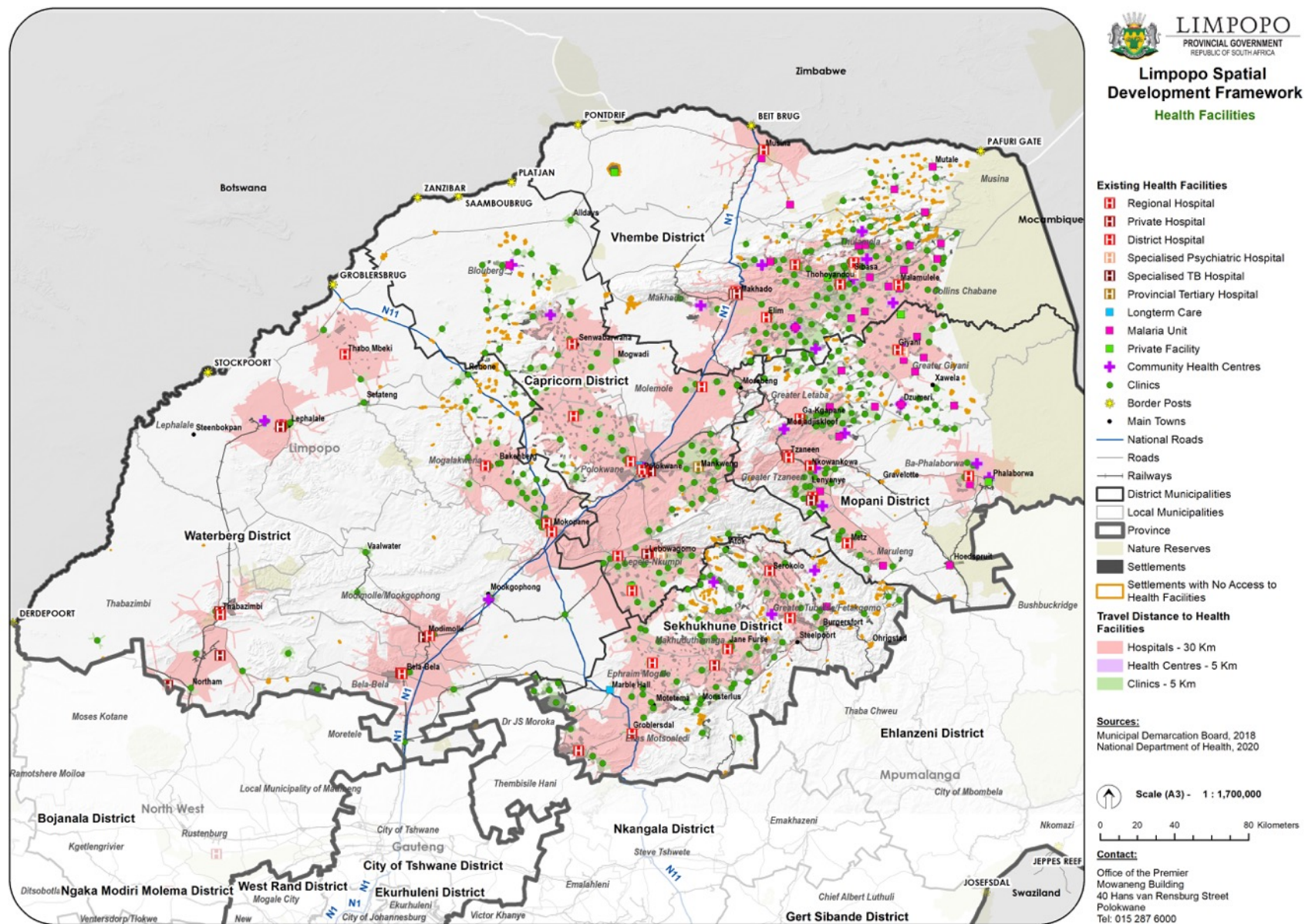


Figure 48: Travel distance to health facilities

Disaster management centres

Disaster management centres in Limpopo are located in each district as follows:

- Capricorn: Polokwane
- Mopani: Tzaneen
- Sekhukhune: Groblersdal
- Vhembe: Muledane
- Waterberg: Modimolle

Fire protection

Figure 49 illustrates the spatial distribution of fire stations in the province. The fire stations are strategically located along key routes and accessible by major arterial roads.

Fire stations are located in the Polokwane national urban core and at the regional development anchors and service towns in the province, namely Musina, Makhado, Thohoyandou, Phalaborwa, Hoedspruit, Tzaneen, Mokopane, Bela-Bela, Modimolle, Mookgophong, Lephalale and Groblersdal.

Distances in the Province are far and can therefore justify that such centres are located in lower order settlements.

Most fire stations are also located at disaster management centres to provide an integrated emergency service to the district.

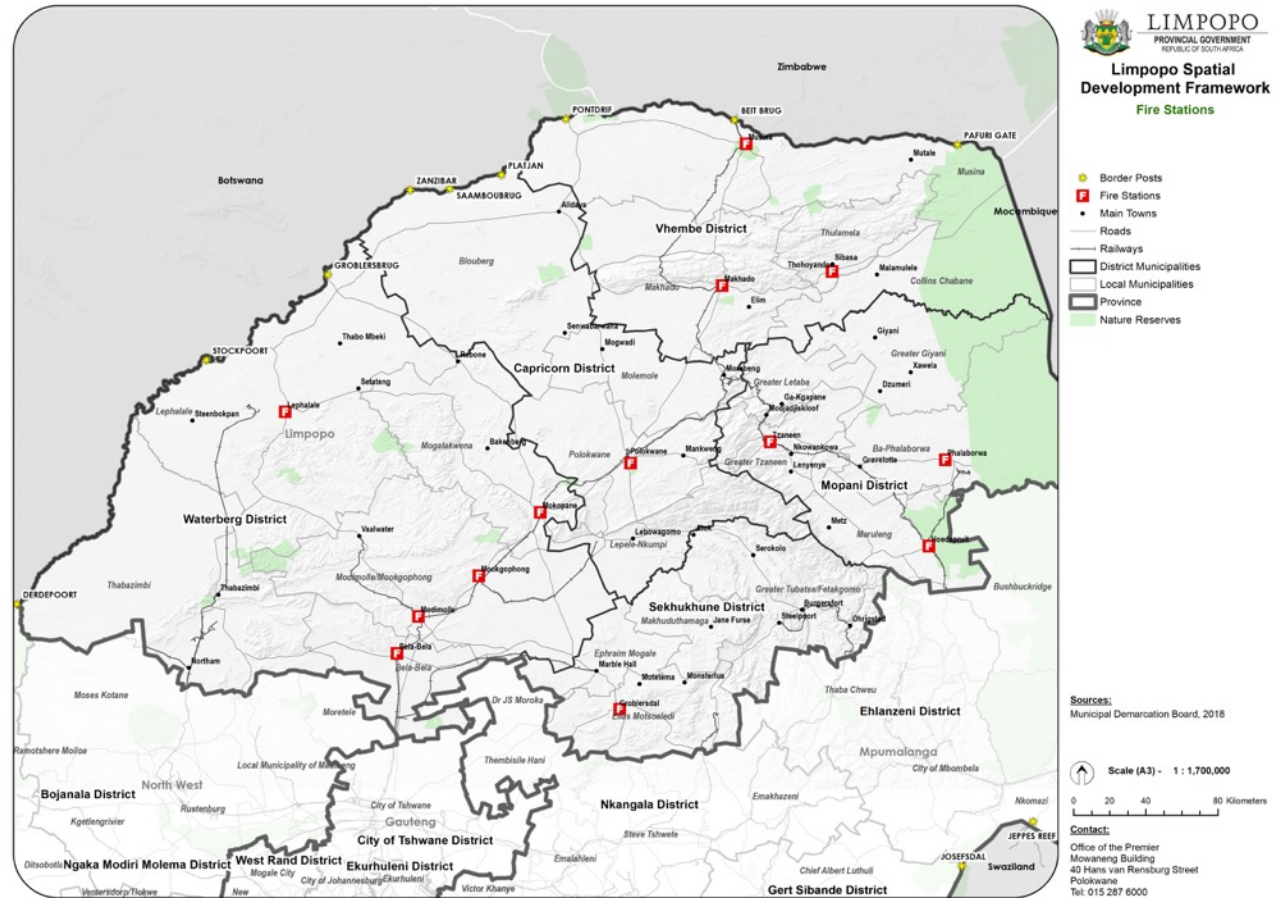


Figure 49: Distribution of fire stations in the province

4.2.6.2 Skills and education facilities

Polokwane is the main educational centre in the province and house various satellite campuses for universities such as University of South Africa (UNISA) and private educational facilities. According to the SOPA, 2023, the provision of solar power has been prioritised for education services to ensure that the educational facilities will not be constrained by interruptions in electricity supply.

Tertiary education

There are universities in the city of Polokwane and regional development anchors of the province, namely Mankweng (University of Limpopo), Thohoyandou (University of the Venda) and Polokwane (Tshwane University of Technology and UNISA).

Educational colleges such as further education and training (FET) colleges are found on the outskirts of towns that function as regional development anchors and regional centres such as Mahwelereng, Nkowankowa, Seshego, Namakgale and in service towns such as Groblersdal, Bela-Bela and Modimolle. The spatial distribution of these facilities is depicted in Figure 50.

According to municipal IDPs and SDFs, safe and adequate access for buses and public transport to these facilities is critical. Dedicated and sufficient parking areas for buses seems to be a challenge. As a result, a large number of buses indiscriminately park around these facilities.

Private training facilities are also found across the province, mainly in urban centres.

Although the LSDF does not deal with the curriculum offered at higher education facilities, it is prudent to note that the skills development offered should enhance the economic development initiatives in the province, especially advancing into 4IR. The spatial location of mining and industrial initiatives is therefore illustrated in the LSDF to inform growth in the educational offerings provided in the province.

Secondary, primary and combined schools

The number of secondary, combined and primary schools are summarised in Table 18.

Table 18: Limpopo number of educational facilities per district

Area	Number of educational facilities		
	Secondary school	Combined school	Primary school
Limpopo	1,287	151	2,384
Capricorn	313	26	541
Mopani	248	23	431
Sekhukhune	306	45	528
Vhembe	275	38	638
Waterberg	145	19	246

Source: National Department of Education 2022

The series of maps in Figure 51 to Figure 54, spatially depict the location of primary, combined and secondary schools within the province, and analyse the access to these facilities according to the CSIR guidelines for radius and travel distance from these facilities.

The primary and combined schools are concentrated in the traditional authority areas and most of the settlements are serviced by either primary schools or combined schools. There are two notable settlements on the outskirts of the Vhembe and Waterberg districts that do not have sufficient access to a primary or combined school.

Limited access to secondary facilities is evident for a larger number of settlements around Mutale in Vhembe, and on the eastern outskirts of Sekhukhune.

Special needs schools

Table 19 provides the number of special needs schools per district in the province. The CSIR's guidelines stipulate that special needs schools are provided at a regional level in accordance with the demand and should be accessible within a radius of 20–25 km. There are three special needs high schools in the province: two in the Capricorn and one in the Vhembe district. Those three schools are boarding schools. There are no high schools in the south of the province. Notably, there are no special schools in the Musina municipality and access to education in this region is a major challenge (Musina LM SDF, 2019).

Table 19: Number of special needs schools per district in the province

District	Number of special schools
Vhembe East	4
Vhembe West	2
Capricorn North	5
Capricorn South	9
Mopani East	3
Mopani West	2
Waterberg	4
Sekhukhune East	4
Sekhukhune South	4

Source: Limpopo Provincial Government Department of Education, 2020

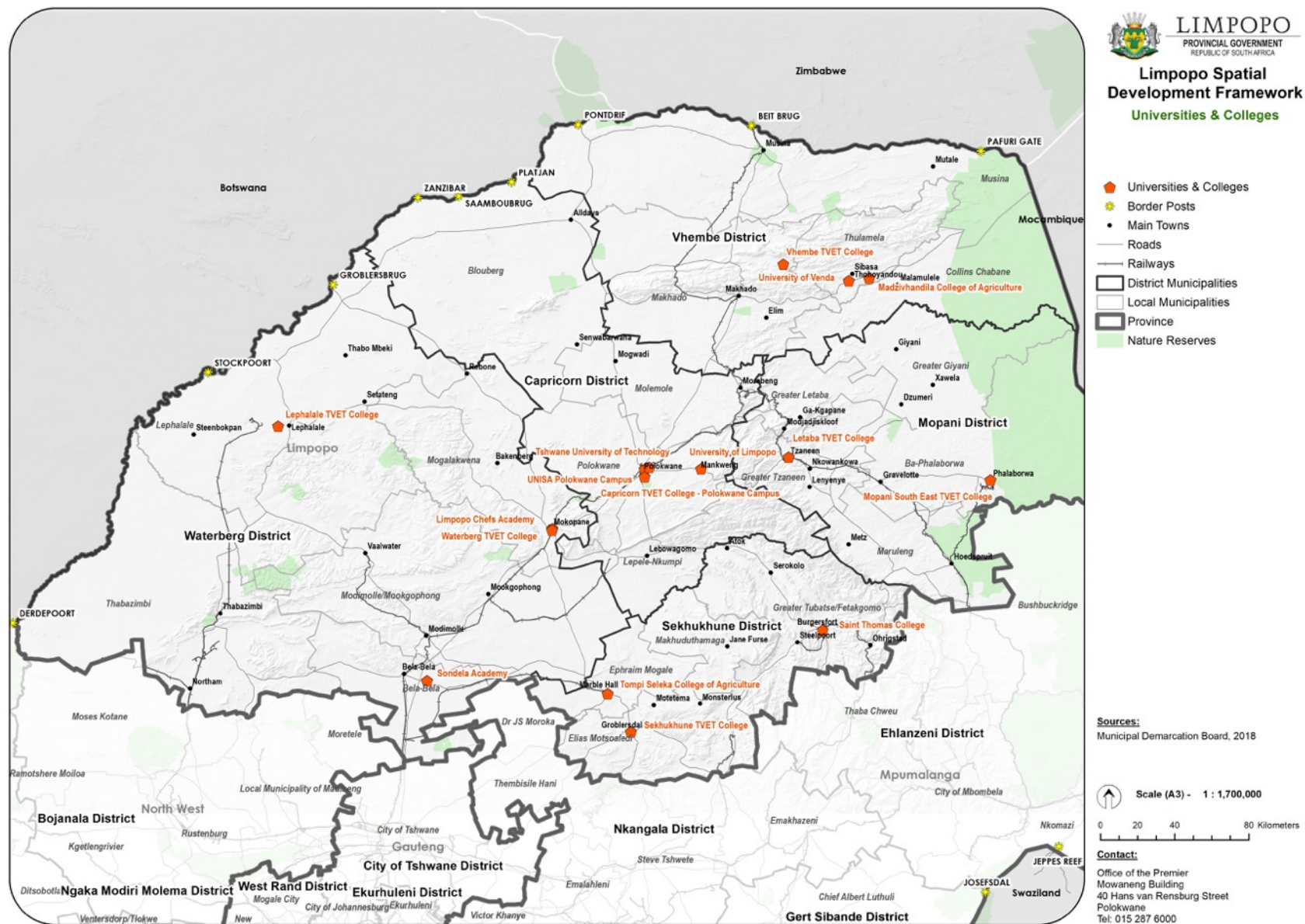


Figure 50: Distribution of tertiary education facilities in Limpopo

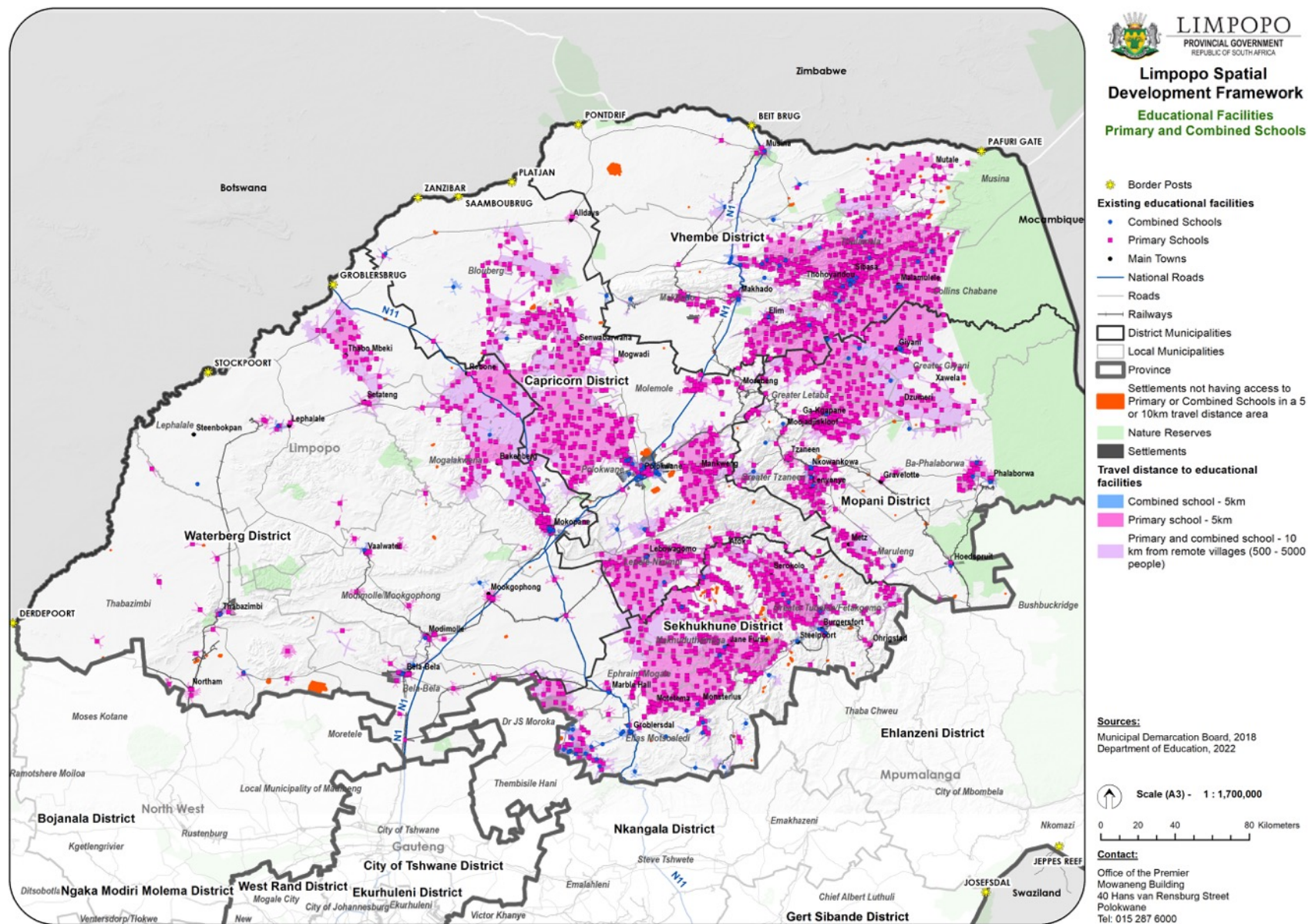


Figure 51: Travel distance to Limpopo primary and combined schools

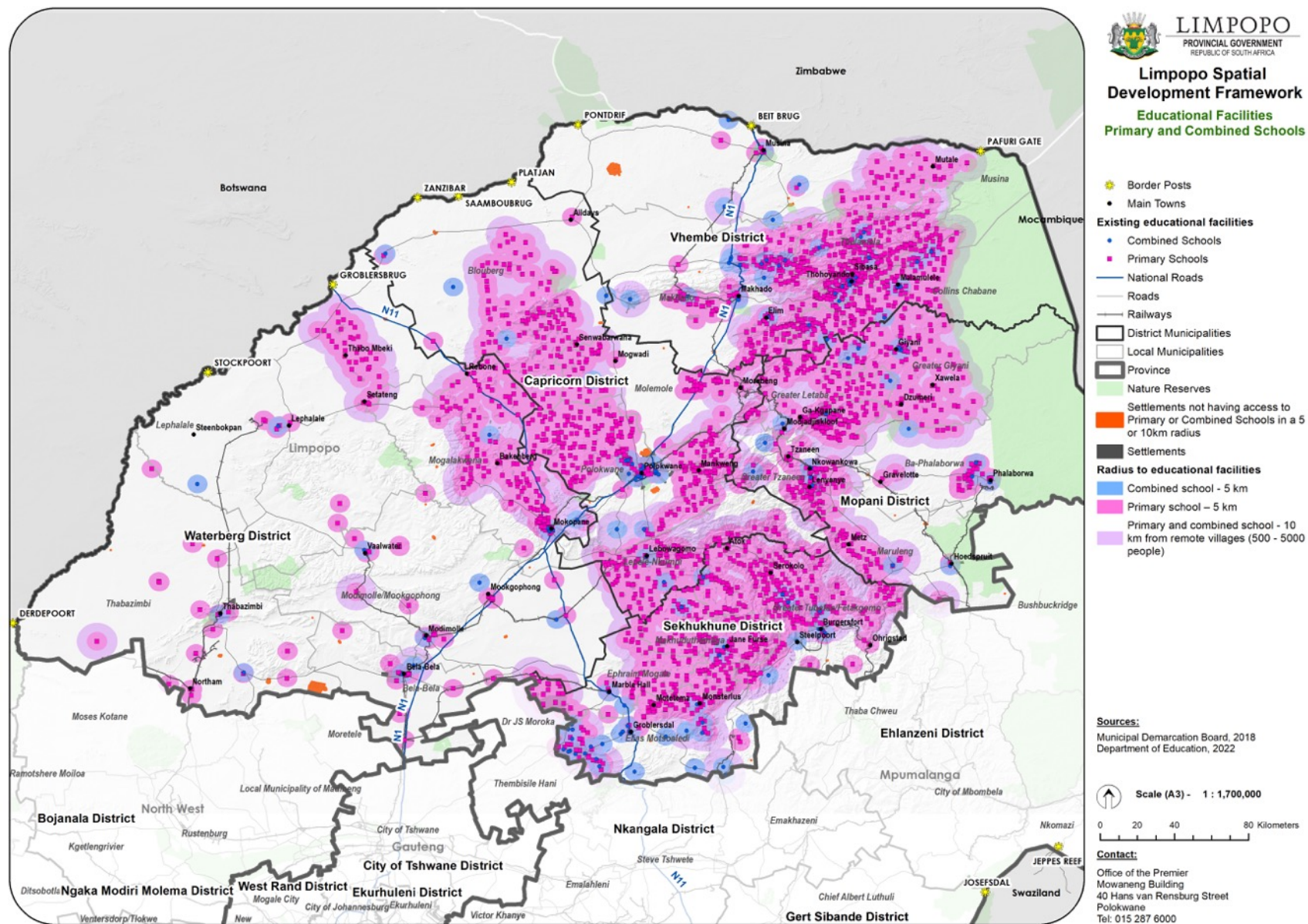


Figure 52: Radial catchment to Limpopo primary and combined schools

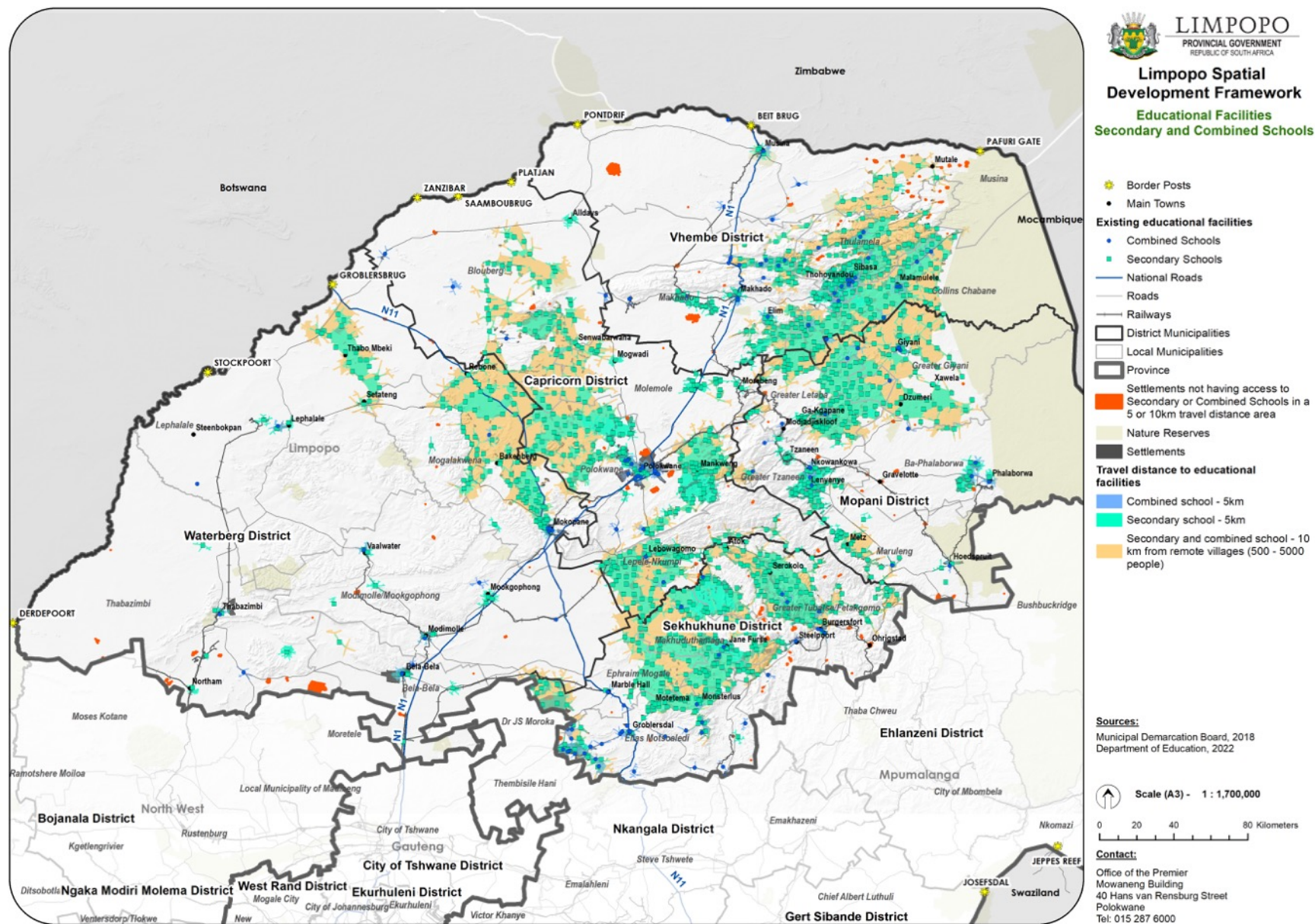


Figure 53: Travel distance to Limpopo secondary and combined schools

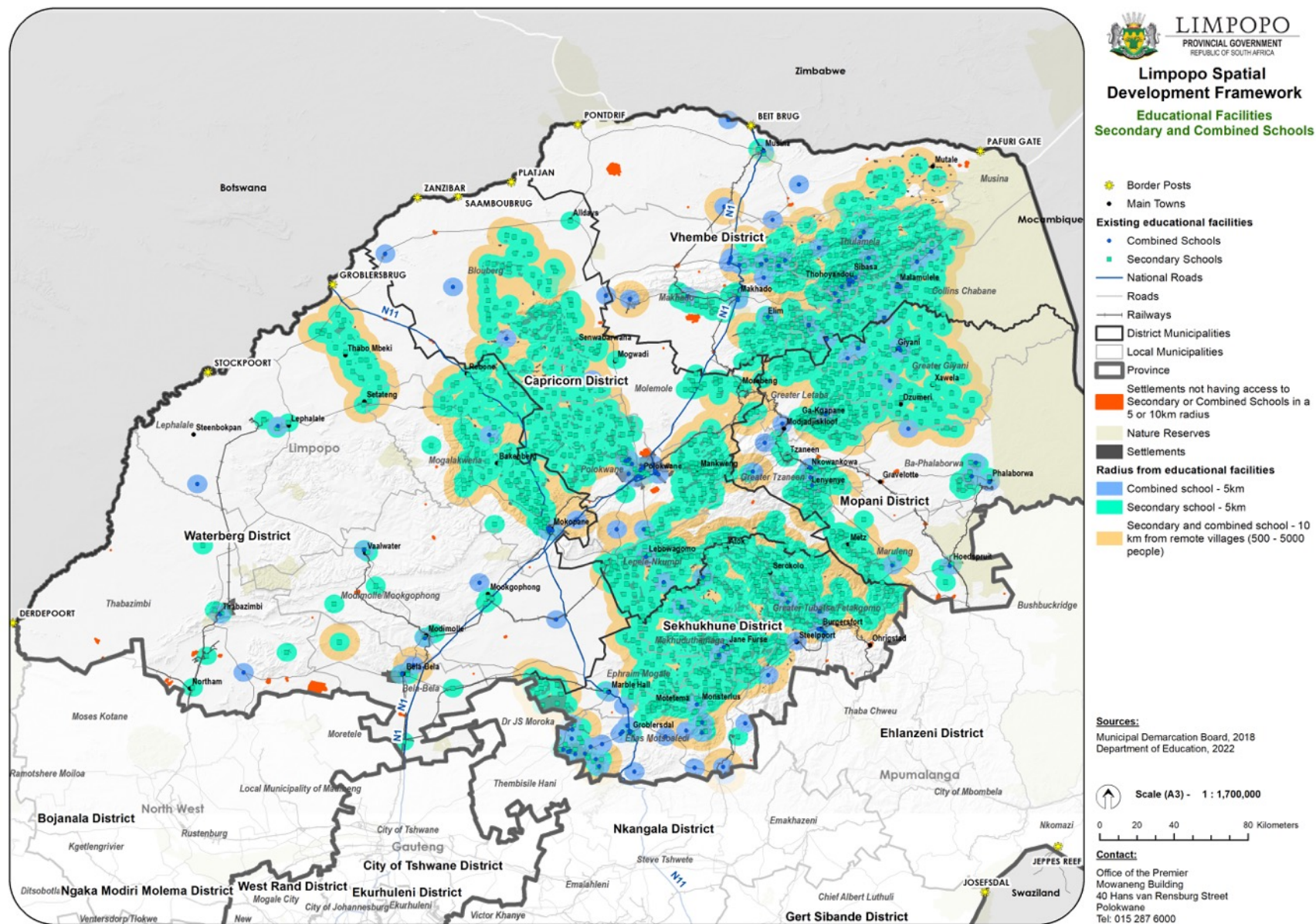


Figure 54: Catchment radius to Limpopo secondary and combined schools

4.2.6.3 Administration and justice

High court and magisterial offices

The provincial high court is located in the City of Polokwane.

There are 20 magisterial offices in the province, particularly located in regional service centres. These are well connected to major roads and arterial routes and are thus easily accessible.

Police stations

Police stations are provided throughout the province, even in smaller towns and settlements, to ensure visible policing and improve households' access to police services. Figure 55 illustrates that police stations are within a radius of 8–24 km of settlements. However, it is evident that some of the police stations are not located along defined arterial roads in the province.

The spatial evaluation of access to police stations also highlights the communities without sufficient access which are the settlements in the Metz area, Maruleng, north of Bakenberg in Mogalakwena, and at Xawela in Greater Giyani. These communities are located most dispersed in the province and access could be by means of mobile services.

The access to police stations by means of roads (travel distance standard) shows an even larger number of settlements not adequately serviced with access to police stations. Figure 56 shows clearly the settlements in red colour located primarily in marginalised traditional areas in Vhembe, Capricorn, Mopani and Sekhukhune.

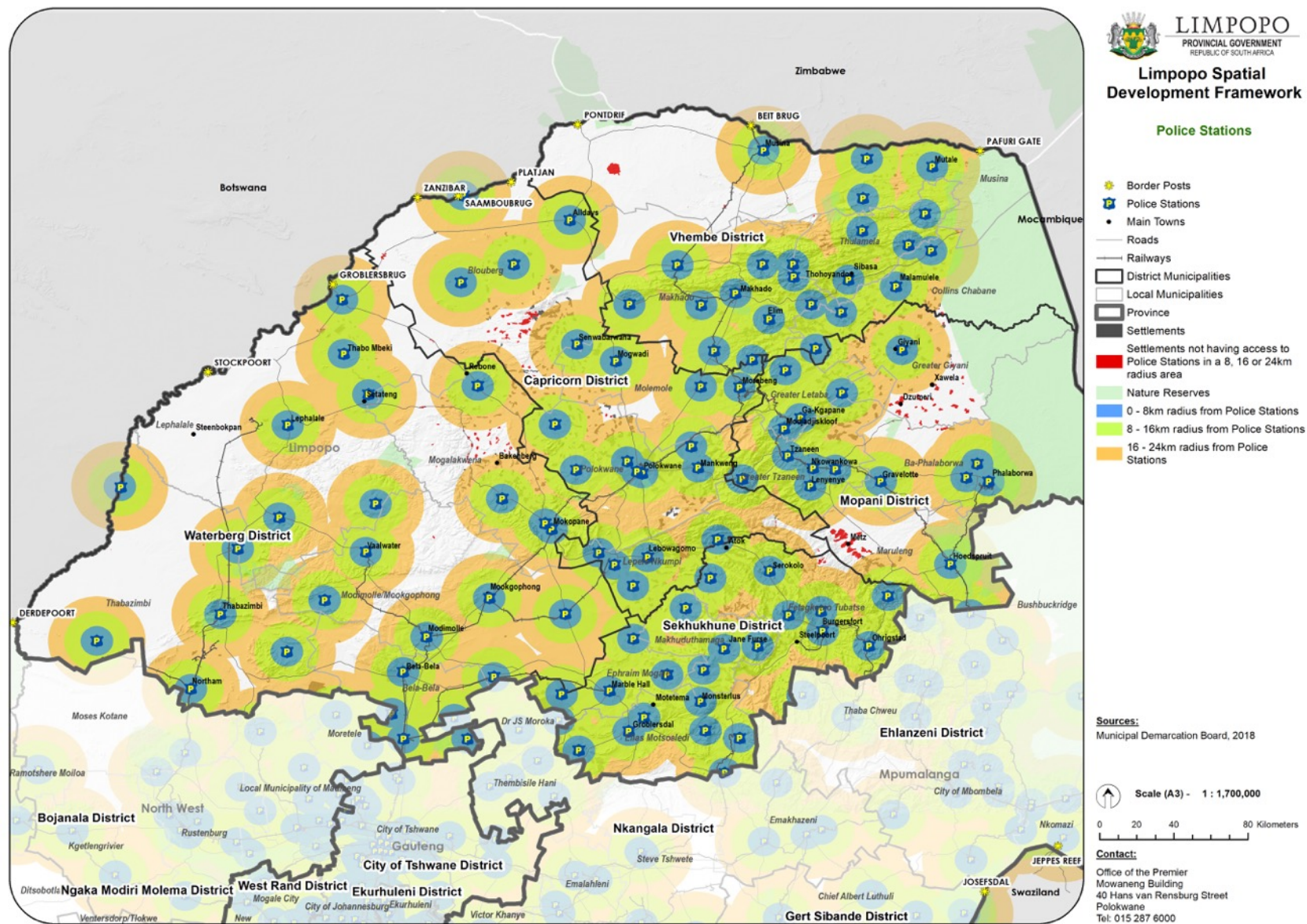


Figure 55: Catchment radius to police stations

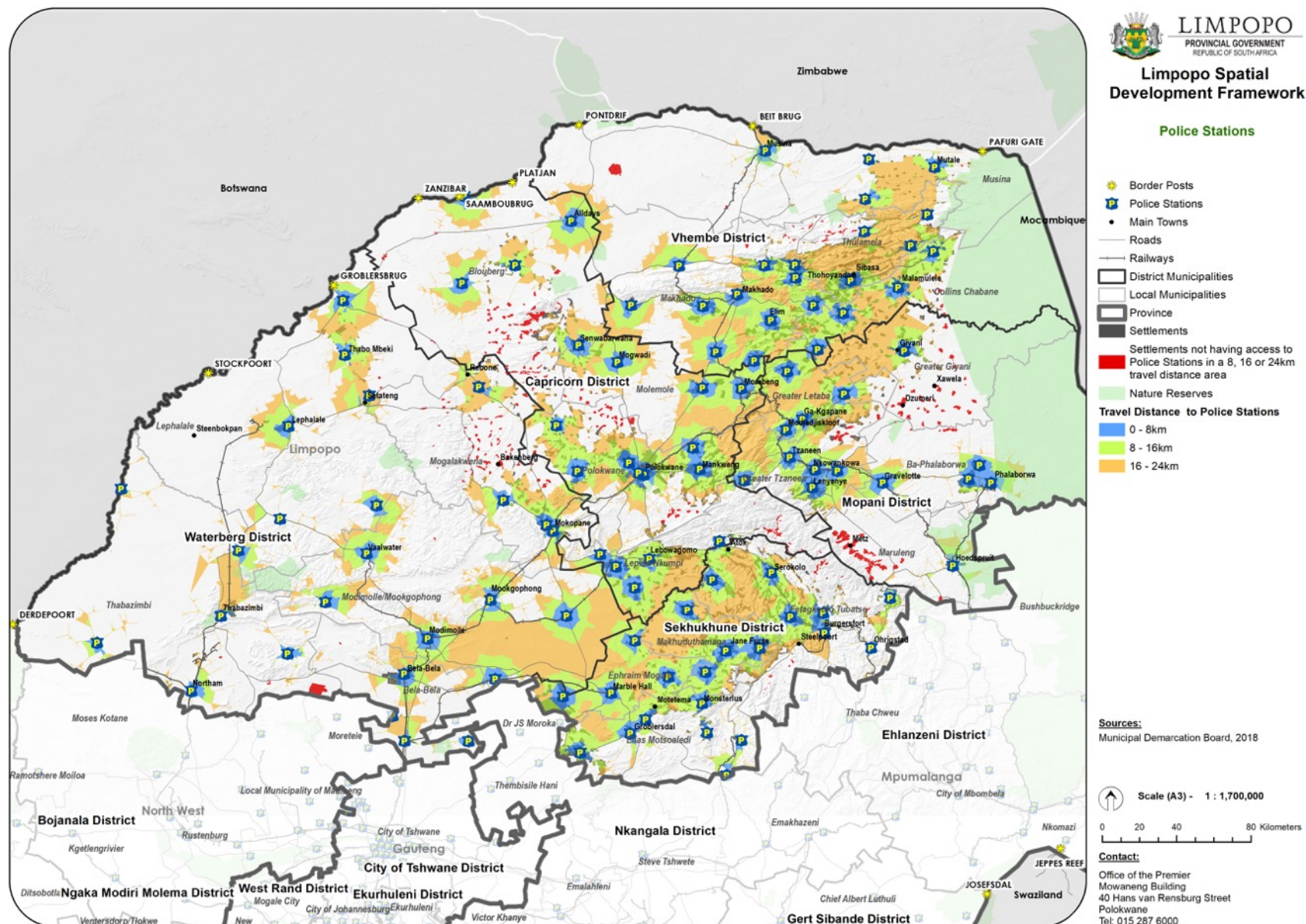


Figure 56: Travel distance to police stations

4.3 Spatial governance

4.3.1 Legislative compliance

For municipalities to function and execute their constitutional mandate in terms of their municipal planning function, and more specifically in terms of spatial planning and land use management, they need to comply with the provisions of the Spatial Planning and Land Use Management Act (SPLUMA), 2013 (Act 16 of 2013).

There are two parts of the Act (*supra*) to deal with in this regard:

- Spatial development frameworks as provided in Chapter 4 of the Act
- Land use management and land development management as provided for in Chapters 5 and 6

The municipal land use scheme forms the basis of proper land use management and, together with a municipal spatial development framework, it forms the entire land use management system of a municipality.

Section 24(1) of SPLUMA therefore stipulates that a municipality must adopt a single land use scheme for its entire area within 5 years from the passing of the Act. It is further stipulated in Section 27 of the Act that the land use scheme must be reviewed at least every 5 years.

The Act was passed on 1 July 2015 (Notice 26 of Government Gazette 3882827 of 27 May 2015), which means that all local municipalities must have adopted and implemented a single land use scheme for the entire municipal area by no later than 30 June 2020.

Section 32 of the Act determines that a municipality may pass by-laws aimed at enforcing the land use scheme.

In Limpopo, the local municipalities have also adopted or passed planning and land use management by-laws to assist in land development procedures and the enforcement of land use and generally also to guide the

process of the compilation of spatial development frameworks and land use schemes. The focus is on processes and public participation.

The last part of land use management and development control is set out in Section 35 of SPLUMA, which stipulates that a municipality must, in order to determine land use and development applications within its area, establish a municipal planning tribunal (MPT). In Section 34, the Act also provides for two or more municipalities to form a joint municipal planning tribunal (JMPT). It is also possible, by agreement between the local and district municipalities, that a district municipality may establish a municipal planning tribunal to dispose of applications within the district municipality's area.

Another provision in SPLUMA to take note of is Section 51, which deals with appeals in respect of land development decisions. Each municipality must also have an internal appeal authority. This may be the executive authority of the municipality or a body or institution outside of the municipality to assume the obligations of an appeal authority.

SPLUMA provides for periods for review for the national SDF and the provincial SDFs once every five years (refer to Section 13(2) and 15(5) of SPLUMA).

For municipal SDFs, SPLUMA provides in Section 20(2) only that a municipal SDF must be prepared as part of a municipality's integrated development plan (IDP) in accordance with the Municipal Systems Act (MSA), 2000 (Act 32 of 2000). The latter specifies that, after the term of a new council, an IDP must be prepared within the prescribed period. The regulations further stipulate that an IDP must inform the municipality's annual budget based on development priorities and objectives (refer to sections 25 and 26(c) of the MSA and Section 6 of the Municipal Planning and Performance Management Regulations, 2001).

Table 20 provides a summary of the legislative compliance of the municipalities in Limpopo in respect of land use management. The assessment was carried out by the DALRRD in 2022 as part of Limpopo's SPLUMA Implementation Forum.

Land use schemes and municipal planning tribunals

The focus of this analysis report is on SPLUMA compliance in respect of land use schemes (LUS) and the operation of their municipal planning tribunals. The reason is that this forms the basis of proper land use management within the municipal area and by the municipality as the 'authority of first instance' (Section 33(1) of SPLUMA).

Based on the summary in the table, it is clear that only four of the twenty-one local municipalities in Province fully comply with the provisions of SPLUMA by having a by-law in place, a single land use scheme for the entire municipal area, and an operational municipal planning tribunal.

The municipalities include:

- Bela-Bela Local Municipality
- Collins Chabane Local Municipality
- Lephalale Local Municipality
- Thulamela Local Municipality

Another aspect that is not attended to in this analysis or in the evaluation of compliance by the DALRRD, is the appeal tribunals. At this stage, it is not clear whether appeals are effectively accommodated by municipalities or not.

Of the total number of local municipalities, almost half of them (eleven) do not have a single land use scheme for their entire municipal area. However, that does not mean that they do not have schemes in operation. It may be that it is a single scheme or just more than one scheme where such schemes are just applicable to different areas, but still cover the entire municipal area, e.g. the Polokwane municipality. The other concerning fact is that some may only have a scheme in place in the urban towns and no LUS in their rural areas, which means that little or no land development control is exercised in the rural areas.

What is encouraging is the fact that most of these municipalities are currently busy reviewing their schemes in order to include single wall-to-wall schemes, which will ensure not only that they comply with SPLUMA provisions but also that land use management is done properly in rural areas.

What is more problematic and important in terms of proper land development management, however, whether they have a single LUS in place or not, is the fact that the local municipalities do not have municipal planning tribunals in operation. This affects land development applications and development directly. Nine local municipalities do not have MPTs in operation:

- Ba-Phalaborwa
- Greater Giyani
- Maruleng
- Elias Motsoaledi
- Fetakgomo Tubatse
- Makhuduthamaga
- Modimolle/Mookgophong
- Thabazimbi

Spatial development frameworks

Most municipalities (21 of the total of 27), including district municipalities, have up-to-date or current spatial development frameworks. Another four municipalities' plans are currently under review.

Implementation challenges

The most significant challenge is the implementation of the land use schemes and spatial development frameworks. Municipalities raised their frustration with public investment not aligned to the framework and the challenges to implement land use schemes on state land and communal/traditional land. The continued demarcation of sites in contradiction to the LUS and SDF is evident across all districts.

Table 20: Limpopo municipalities' compliance with land use management requirements

Municipality			SDF		SPLUMA	SPLUM by-law	Municipal Planning Tribunal			Land Use Scheme		
Name	DM	LM	Date	Comment	Fully compliant	Gazetted	Gazetted	Type	Operational	Date/s	Type	Compliant
Capricorn	X		2011	Outdated								
Blouberg		X	2018	Current	No	Yes	Yes	JMPT	Yes	2006		In process
Lepelle-Nkumpi		X	2017	Current	No	Yes	Yes	JMPT	Yes	2006		In process
Molemole		X	2019	Current	No	Yes	Yes	JMPT	Yes	2006		In process
Polokwane		X	2010	Under review	No	Yes	Yes	MPT	Yes	2016, 2017	MWW	In process
Mopani	X		Unknown	Unknown								
Ba-Phalaborwa		X	2019–24	Current	No	Yes	Yes	JMPT	Unknown	2020	SWW	Yes
Greater Giyani		X	2013	Under review	No	Yes	No	MPT	No	2009	SWW	Yes
Greater Letaba		X	2021	Current	No	Yes	Yes	JMPT	Yes	2009		In process
Greater Tzaneen		X	2017–22	Current	No	Yes	Yes	MPT	Yes	2000		No
Maruleng		X	2015	Current	No	Yes	Yes	JMPT	Unknown	2021	SWW	Yes
Sekhukhune	X		2018	Current								
Elias Motsoaledi		X	2018	Current	No	Yes	No	JMPT	No	2021	SWW	Yes
Ephraim Mogale		X	2018	Current	No	Yes	No	JMPT	No	2019	SWW	Yes
Fetakgomo Tubatse		X	2020	Current	No	Yes	No	MPT	No	2021	SWW	Yes
Makhuduthamaga		X	2021	Current	No	Yes	No	JMPT	No	Unknown	SWW	Yes
Vhembe	X		2019–25	Current								
Collins Chabane		X	2017	Current	Yes	Yes	Yes	MPT	Yes	2018	SWW	Yes
Makhado		X	2011	Under review	No	Yes	Yes	MPT	Yes	2009		In process
Musina			2014–15	Current	No	Yes	Yes	MPT	Yes	2010		In process
Thulamela		X	2019–23	Current	Yes	Yes	Yes	MPT	Yes	2020	SWW	Yes
Waterberg	X		2021	Current								
Bela-Bela		X	2018	Current	Yes	Yes	Yes	JMPT	Yes	2019	SWW	Yes
Lephalale		X	2017	Current	Yes	Yes	Yes	MPT	Yes	2017	SWW	Yes
Modimolle-Mookgophong		X	2021	Current	No	Yes	No	MPT	No	2004		In process
Mogalakwena		X	2017–18	Current	No	Yes	Yes	JMPT	Yes	2008		In process
Thabazimbi		X	2014	Under review	No	Yes	No	MPT	No	2014		In process
NOTES:	DM	District Municipality										
	LM	Local Municipality										
	MPT	Municipal Planning Tribunal as contemplated in Section 35 of SPLUMA										
	JMPT	Joint Municipal Planning Tribunal as contemplated in Section 34 of SPLUMA, normally coordinated by the district municipality (Section 34(2))										
	SWW	Single Wall-to-Wall Land Use Scheme as contemplated in Section 24 of SPLUMA										
	MWW	Multiple Land Use Schemes covering wall-to-wall (Two or more schemes covering entire municipal area)										

Source: (Dept Agriculture, Land Reform and Rural Development, 2022)

4.3.2 Spatial forward planning and land use management

In general, the term spatial planning is used to describe or refer to the process that seeks to organise how the physical space within an area is used by society and the built environment. On municipal level it includes two components, namely spatial forward planning and land use or land development management.

Both these components work in relation to each other as illustrated in Figure 57 to ensure specific or desired development outcomes within a municipal area.

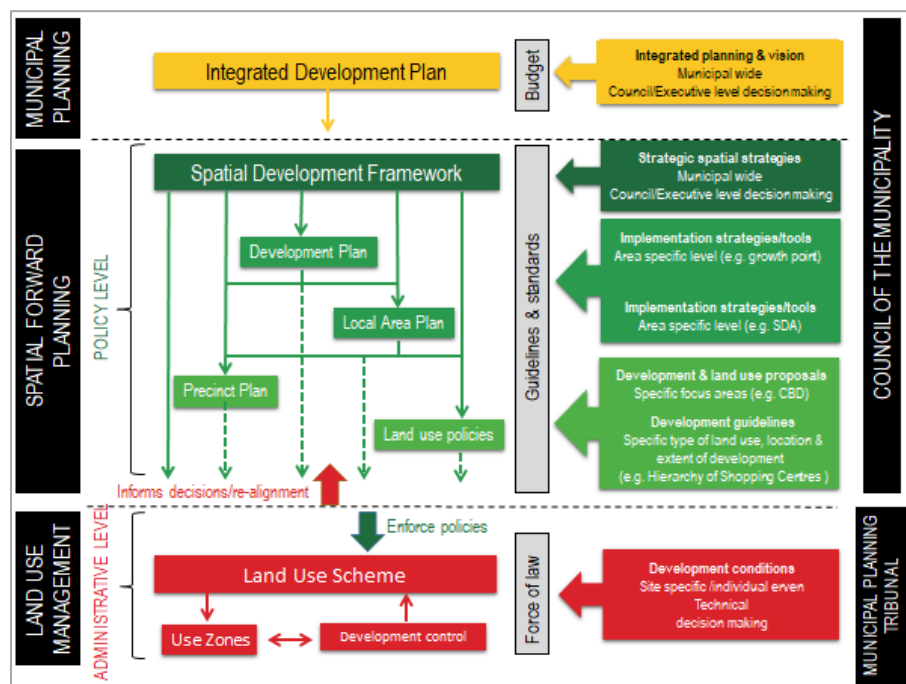


Figure 57: Relationship between spatial forward planning and land use management within the municipal planning

Spatial forward planning is policy-led and the prerogative of a Council and the executive authority of the municipality and provided for specifically in SPLUMA and the Municipal Systems Act, 2000 (Act 32 of 2000).

However, spatial forward planning takes place on different levels, but all informs decision making about development, and specifically influencing decisions of land use change in terms of land development.

Land development decisions, however, is on a land use management/land development level and specifically provided for in SPLUMA, by means of Land Use Schemes and Municipal Planning Tribunals to decide over land use changes.

The decisions made in terms of the land use scheme should be informed by policy-led documents such as the SDF. In its turn, the Land Use Scheme enforces the policies and strategies contained in spatial forward planning in order to reach the spatial vision and land use patterns envisaged by the SDF.

However, decisions in terms of the Land Use Scheme and the Land Use Scheme itself, have the force of law and are not just mere development guidelines.

Decisions in terms of the Land Use Scheme are hence on an execution level and should not act outside parameters laid down by the policy makers and the guidelines provided by policy makers, as illustrated in Figure 57.

It is evident from paragraph 4.3.1 above that municipalities either do not have functioning municipal planning tribunals to enforce council policies by means of land use decisions in terms of the land use schemes, or that their SDFs are outdated which will result in poor decision making by the tribunal. Hence, it would be difficult to ensure proper development control in the municipal areas of jurisdiction when this shortcoming is considered.

However, the challenge lies deeper. Municipal SDF's are either not implemented or outdated, or lack proper development guidelines, such as provision for urban/development edges to all settlements, or to provide strategic direction and earmarking areas for future land use proposals that will ensure sustainability over the long term.

This all contributed towards poor decision-making or lack of pro-active forward planning.

One component of development control, where proper spatial forward planning and enforcement of land development control is required in the province, is in the rural areas. Unwanted or uncontrolled development in the rural areas, and even some urban areas, is evident. Urban sprawl is not contained and scattered settlements in the province continues despite SPLUMA's development principles. The lack of proper control may either lie in shortcomings in spatial forward planning, or enforcement of land development management.

4.3.3 Spatial governance directives

The need expressed to improve the implementation of spatial development frameworks, starting with the LSDF, require that spatial governance directives are formulated and institutionalised across all spheres of government.

The spatial governance directives need to direct the spatial prioritisation of public investment and find relevance in strategic plans and annual performance plans.

Spatial governance directives are also required to improve integration and consolidation of investments. The DDM One Plans and the PSHDA integrated implementation programmes are key to integrated planning and resource allocation in the province.

It is therefore advisable to define spatial governance directives to realise the spatial vision for the province.

4.3.4 Spatial data integration and management

Informed decision making is dependent on a well-managed, integrated and updated information and data management system. It was clear during the review of the LSDF that data is scattered across the province, or not sufficiently updated. The impact of COVID-19 also resulted in certain monitoring systems to be halted.

Understandably certain data sources are managed on national level and protocols apply in releasing the data to provinces and municipalities. Examples include information on public owned land and traditional authority boundaries. The difficulty to source the data results in development plans not accommodating and considering the data, or applying outdated data sources. It therefore becomes important that spheres of government re-align and share data sources to improve integrated planning on provincial and municipal level.

A shared geospatial database provides valuable information to inform decisions and to identify development opportunities and risks. Within the province, geospatial data sources remain dispersed between departments, despite integration efforts through the GIS forum. A combined and central service function can provide a stronger spatial data management service to the province than small under-capacitated units across the province.

The adequate implementation of the LSDF is also reliant on an integrated spatial data management source that informs and supports the province with well-maintained data.

4.4 Key spatial issues and synthesis from the built environment

The provincial spatial structuring elements consist of regional connectivity and movement lines, provincial land use distribution, the provincial land tenure system and its impact on settlement form, and the resultant hierarchy of settlements, their role, form and growth patterns.

4.4.1 Connectivity and movement

The N1 and N11 serve as trunk or backbone roads that contribute to the strategic connectivity of the province to neighbouring provinces Gauteng, North West and Mpumalanga, as well as neighbouring countries Zimbabwe and Botswana. The provincial regional road network encompasses an expanded network of roads than the network included in the LSDF 2016.

The key regional movement network connects nodal areas in Limpopo to Gauteng, North West and Mpumalanga and also to Botswana, Zimbabwe and Mozambique. The province has nine border posts with Botswana, Zimbabwe and Mozambique. The Phalaborwa corridor, and the regional route connecting Makhado to Thohoyandou, then to Giyani and finally to Mbombela via Hoedspruit/Bushbuckridge, are recognised as key regional routes in the NSDF. Since 2016, SANRAL has taken ownership of regional roads previously owned by the province.

Concentrations of settlements and economic activity that are not adequately served by the regional network include settlements in the north-western part of Blouberg, Senwabarwana that has also experienced significant settlement growth, the weak regional road link with high traffic between Gauteng via the Moloto road and N11 at Marble Hall/ Groblersdal to Jane Furse and Lebowakgomo (R579), the weak links between the platinum and chrome operations south of Steelpoort and Mashishing/Lydenburg where the chrome smelter and more residential opportunities are, and the concentrations of settlements in Makhuduthamaga, Fetakgomo Tubatse, Greater Letaba, Greater Giyani and Collins Chabane.

The national and regional routes carry the highest private vehicle traffic volumes (SANRAL 2021 and RAL 2016) are mostly between nodes and from rural settlement areas to nodes. The routes with high freight volumes clearly affirm the economic patterns in the province. The routes connect industrial and mining activity, as well as commercial agriculture in the various regions with freight corridors. It also shows the occurrence of freight corridors with truck traffic from neighbouring countries such as Zambia and Zimbabwe.

The high passenger volumes clearly reflect commuting patterns in the province and the linkages to Gauteng. A lot of the movement occurs between outlying rural areas and nodes. The high passenger volumes on the R25, R33 and R579 between Gauteng, Groblersdal, Jane Furse and Lebowakgomo, re-affirms the community need and Ephraim Mogale municipal SDF proposals for improved access to the settlements around Jane Furse and Lebowakgomo, from Gauteng.

4.4.2 Land tenure

Land tenure has an impact on spatial structure in the province. The historical pattern created by the former homelands whereby land is held by the state for occupation by communities, has manifested in the scattered settlement pattern of the central and eastern parts of the province.

State land owned by national government entities cover large tracts of land in the central and eastern parts of the province, the two national parks namely the Kruger National Park and Marakele National Park. There are clusters of state land that are held either under custodianship for traditional communities or in trust. The main land tenure trend in the province is the transition of land from the state and private ownership to communities.

4.4.3 Provincial macro land use pattern

Limpopo is characterised by large tracts of land used for agriculture and grazing. Settlements are concentrated in the central and eastern parts of the province, with Polokwane being the largest city and located in the centre of the province. The province is home to 2,684 settlements that range from

large to medium-size formal towns, to small scattered villages, covering 4% of the total land area of the province. The N1 is the main north–south structuring element in the province, linking the city of Polokwane to Gauteng in the south and to Zimbabwe in the north. Apart from Polokwane, seven of the main towns in the province are situated along or close to this north–south corridor. Four large population concentrations of small to medium-size villages are found in the north-western, central and eastern parts of the province, mainly on traditional or communally owned land.

Conservation uses cover approximately 21.5% of land, including the Kruger and Mapungubwe National Parks. Agriculture is the most extensive land use covering 75% of provincial land. The varied climatic regions found in the province allow for the production of a wide variety of agricultural produce, ranging from forestry to tropical fruits such as banana and mangos, citrus fruits, blueberries, nuts (macadamia and pecan), avocados, cereals such as maize and wheat, and vegetables such as tomatoes, onion and potatoes. Agriculture also includes grazing and game farming. The province has latent potential for more cultivation: 50% of the province is moderately to highly suitable for agricultural land uses, however, only about 9% is cultivated.

Limpopo has 147 operating mines. Limpopo's rich mineral deposits include over 50% of the country's untapped coal resources, platinum group metals (PGMs), iron ore, chromium high- and middle-grade coking coal, diamonds, antimony, phosphate and copper, as well as mineral reserves such as gold, emeralds, scheelite, magnetite, vermiculite, silicon and mica. Mining clusters have a high impact on land use structure and movement patterns, attracting not only residential use but also beneficiation uses such as smelters as well as the transport / logistics clusters and in some cases lead to nodal development. Platinum mining clusters are found at Mogalakwena, Northam/Amandelbult, and Burgersfort/ Steelpoort. The coal and petrochemical cluster is located at Lephalale and Steenbokpan. The Musina Makhado mining cluster (coal and diamonds) is located north of the Soutpansberg at Alldays. The Phalaborwa copper mining cluster is located at Phalaborwa town.

4.4.4 Settlement form

The settlement forms found in the province are formal townships, less formal townships or villages, agricultural holdings complexes and informal settlements, as well as farmsteads on agricultural land. The types of settlement patterns currently found in the province are clustered or nucleated settlements, linear settlements, and scattered or dispersed settlements. The dominant type of settlement pattern in the Waterberg district is clustered settlements, whereas scattered settlement types are dominant in the central and eastern parts of the province. Clustered settlements tend to concentrate along the main movement routes, or where those routes intersect. Scattered settlements occur in rural areas, in predominantly the traditional authority areas.

Rural densification is a current development trend where communities develop middle- to high-income residential houses on state or tribal land that borders main towns or road corridors, even where there is no formal tenure security and where no community and municipal services are planned. This development trend is beginning to restructure spatial patterns as well as local economies in the province. The downside of the trend is that it results in an increase in the backlog of planning and service provision and increases daily commuting to the closest urban area while public transport and road infrastructure is not properly planned and upgraded to accommodate such densification. This specific trend occurs along the R71 between Polokwane and Mankweng, the R37 to Burgersfort, the R37 between Nkowankowa and Lenyenye, the R524 between Thohoyandou and Sibasa and the N11 north of Mokopane.

Both urban and rural settlements have a fairly low density, as is characteristic of predominantly rural regions. Urban settlements have an average density of 12.58 units/ha and an average erf size of 2,035 m². Rural settlements have an average density of 4.46 units/ha and an average stand size of 3,310 m². If current low density rural development continues per the current trend, the additional land area needed by 2031 will be 68,074 ha (close to 70% of the area currently occupied by settlements in the Mopani District). Further additional land needed by 2051 will be 238,265 ha. The land area covered by settlements will increase with around 49%. This level

of sprawl impact negatively on both the agriculture and mining sectors and threatens natural resources such as water as well as ecosystems.

4.4.5 Settlement Role

Currently there is a high level of correlation between the growth points identified in the LSDF 2016 and the national urban nodes and regional development anchors identified in the NSDF 2022. The settlement hierarchy for Limpopo was evaluated to determine which nodes or settlements play, or should play, a prominent role in the province and the respective regions. Factors taken into account include current national, provincial and district planning, household growth patterns, connectivity of settlements in terms of national and provincial corridors, priorities and proposals, and national and provincial spatial targeting. Polokwane, Tzaneen, Burgersfort and Musina emerged as strong nodes.

To optimise on the potential for spatial transformation the role of each Growth Point needs to be defined in terms in spatial transformation, economic development prospects and access to social services. This includes special consideration of the changing roles of Burgersfort and Lephalale due to population and economic dynamics.

4.4.6 Human Settlements and Housing

The larger concentrations of informal structures are found in the main formal towns of the province such as Polokwane, Mankweng, Mokopane, Tzaneen/Nkowankowa/Lenyenye, Phalaborwa, Modimolle, Northam/Thabazimbi, Lephalale and Burgersfort. Notable concentrations are also found in Musina, Senwabarwana, Dennilton, Monsterlus, Ga-Kgapane, Giyani, Thohoyandou, Malamulele, Mookgophong and Vaalwater. The largest concentrations of informal settlement growth occurred in Northam and Modimolle, followed by Lephalale and Bela-Bela. High concentrations of informal residential structure growth are also evident in the Polokwane-Seshego urban complex, and at Nkowankowa/Lenyenye.

The 2019 - 2024 housing demand for Limpopo Province is estimated at 307,844 households in the Limpopo MYHSDP 2019-2024. Eleven Priority

Human Settlements and Housing Development Areas (PHSHDAs) were declared in Limpopo in Polokwane, Greater Giyani, Greater Tzaneen, Fetakgomo Tubatse, Musina/Makhado, Thulamela, Lephalale and Thabazimbi. The provincial priority projects led are: Makgathoville (Polokwane extensions 121 and 86), Ivypark Extension 35, and Annadale Social Housing in Polokwane, Warmbaths Extension 25, Bela-Bela and Mogalakwena Extension 20, Mokopane. The provincial priority housing projects are also included in the PHSHDAs except for Warmbaths Extension 25 and Mogalakwena Extension 20. Alignment is observed between areas with high levels of residential structure growth in the delineation of spatial targeting areas in Polokwane, Lephalale, Tzaneen and Northam. However, the following areas have experienced significant household growth, but are excluded as PHSHDAs: Jane Furse, Senwabarwana, Phalaborwa/Namakgale/Lulekani, Lenyenye, Malamulele, Lebowakgomo and Mokopane.

The Limpopo Development Plan proposes the following nodes to be prioritised or developed as smart cities in the province: Polokwane, Tzaneen, Musina and Lephalale. In addition, the Nkuna smart city is a private greenfields initiative located on 119 ha near the Nkuzana village, between Elim and Giyani along the R578.

4.4.7 Social infrastructure

An analysis to social facilities show that some rural areas have low accessibility to various social services such as schools and health facilities. This lack of access correlates with socio-economic vulnerability in terms of poverty and low levels of schooling as analysed in the socio-economic analysis (section xx).

4.4.8 Spatial Governance

Only four municipalities are currently fully SPLUMA compliant. All municipalities and districts with the exception of Capricorn and Mopani have current SDFs, with four of those SDFs under review. All municipalities have Gazetted SPLUMA by-laws.

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Appendix A: Glossary of terms - land ownership

Term	Description
Privately owned land	<p>Privately owned land includes land or erven under freehold and common hold titles. This category represents formally surveyed land that has been approved by the Surveyor-General's Office and fully registered in the Deeds Office (Title Deed/Deed of Grants) in the name of a juristic person or community. The land is transferable or leasable. It includes farmland/portions, agricultural holdings and erven in promulgated townships.</p> <p>In terms of commonhold land, it includes land registered in the name of a communal property association (CPA) through provisions of the Communal Property Association Act, 1996 (Act 28 of 1996). This "new" tenure form registered in the Deeds Office mostly relates to land transferred to communities by means of land restitution. Unlike customary tenure of PTOs referred to in other parts of this section, land under this tenure type is held under a freehold title but registered in the name of a group of persons or the property is held in common and not owned by the state.</p> <p>In terms of the Act, the "holding of property in common" means the acquisition, holding and management of property by an association on behalf of its members (communities) in accordance with the terms of the association's constitution, established in terms of the Act.</p>
State owned land	<p>State land or publicly owned land includes three sub-categories of land ownership:</p> <ul style="list-style-type: none"> ▶ State land in former "white areas" in the RSA ▶ State land in former TBVC states, self-governing territories and homelands ▶ Land owned by state-owned enterprises <p>State land in former "white areas" in the RSA</p> <p>This land includes land registered in the name of the Republic of South Africa and vests in the Minister of Public Works. It is normally surveyed and registered in the Deeds Office. State land for domestic use is a provincial competency and therefore it is usually owned by the Provincial Department of Public Works. This type of land falls under the "formal system". Normally, the Title Deed or Deeds Office will refer to/indicate such land as registered in the name of the RSA. However, it may also be found that land is registered in the name of a provincial government.</p> <p>State land in the former TBVC⁵ states, self-governing territories⁶ and homelands</p> <p>This category of state-owned land includes land that is held in trust by the Minister of Rural Development and Land Reform. In this instance, the land may be surveyed and registered in the Deeds Office, but that is not always the case. Some "communal land" was surveyed only recently and may not be registered in the Deeds Office yet. Land in this category was previously governed through provisions of the Black Land Act, 1913 (Act 27 of 1913) and the Development Trust and Land Act, 1936 (Act 18 of 1936). This form of state land provides the following tenure type systems:</p> <ul style="list-style-type: none"> ▶ Communal land or permissions to occupy (PTOs) ▶ Customary land <p><u>Communal land or permissions to occupy (PTOs)</u></p>

⁵ TBVC includes the former Venda in the case of Limpopo.

⁶ Self-governing territories include the former Gazankulu and Lebowa areas in the case of Limpopo.

	<p>This category includes land owned by the state and held in trust by the Minister of Rural Development and Land Reform for use or occupation by traditional communities. Land is occupied by individuals under the permission to occupy (PTO) system or under customary tenure as described below. This land previously formed part of the Transkei, Bophuthatswana, Venda and Ciskei (TBVC) homelands. In the case of Limpopo, it is the Venda area. PTOs were normally provided for under provisions of the Black Areas Administration Act, 1927 (Act 38 of 1927) and Proclamations R188 of 1969 and R293 of 1962. A PTO is a permit that is issued to a person, normally the head of a household, for the occupation of unregistered state land or communal land. The permit is therefore attached to a person and not a surveyed parcel of land. However, after 1994, under the new dispensation, individuals' tenure rights in land in this instance were protected by the Interim Protection of Informal Land Rights Act, 1996.</p> <p><u>Customary land</u></p> <p>Customary land is state land held in trust by a customary chief (nkosi) on behalf of a traditional community. Land is allocated to individuals by a hierarchy of traditional leaders, consisting of the chief and his/her indunas. Hence government created and superimposed the structure of traditional authorities.</p> <p>Land owned by state-owned enterprises</p> <p>State-owned enterprises (SOEs) include land owned by organisations under the ownership control of the Government of the Republic of South Africa, such as the Limpopo Economic Development Agency or the former Lebowa and Gazankulu development corporations, SANRAL and ESKOM.</p>
Municipal-owned land	<p>Municipal-owned land is a type of freehold land but includes land registered in the name of a municipality, which is empowered in terms of Chapter 7 and Section 156 of the Constitution of the Republic of South Africa to perform certain duties and hold land in trust for community purposes and facilities.</p>

Appendix B: Densities in Limpopo

Area	Local municipality	Total settlements		Urban settlements		Rural settlements	
		Average nett density (units/ha)	Average erf size (in m ²)	Average nett density (units/ha)	Average erf size (in m ²)	Average nett density (units/ha)	Average erf size (in m ²)
Limpopo		4.79	3,259	12.58	2,035	4.46	3,310
Capricorn		4.50	3,634	14.27	1,417	4.14	3,716
	Blouberg	2.94	5,834	4.54	2,239	2.92	5,882
	Lepelle-Nkumpi	3.87	3,061	6.44	2,385	3.83	3,072
	Molemole	6.75	2,880	3.51	3,059	6.88	2,873
	Polokwane	5.14	2,878	17.81	988	4.40	2,989
Mopani		5.53	2,409	9.17	2,248	5.32	2,418
	Ba-Phalaborwa	8.17	1,708	10.13	2,186	7.62	1,576
	Greater Giyani	5.43	2,624	13.97	1,410	4.99	2,687
	Greater Letaba	6.57	1,938	7.24	2,379	6.56	1,928
	Greater Tzaneen	4.93	2,494	7.44	1,893	4.81	2,522
	Maruleng	3.40	3,229	1.89	5,430	3.51	3,066
Sekhukhune		4.03	3,914	14.70	1,802	3.76	3,967
	Elias Motsoaledi	4.81	3,009	10.46	1,464	4.44	3,111
	Ephraim Mogale	4.27	3,276	5.32	2,524	4.23	3,304
	Fetakgomo Tubatse	4.30	3,739	18.51	1,987	3.94	3,783
	Makhuduthamaga	3.13	4,845	23.83	420	2.99	4,874
Vhembe		4.38	3,176	10.33	3,025	4.29	3,179
	Collins Chabane	4.88	2,618	6.43	1,555	4.87	2,625
	Makhado	4.67	2,634	6.67	4,239	4.60	2,574
	Musina	4.19	3,547	22.66	776	3.44	3,659
	Thulamela	4.03	3,671	6.54	1,528	4.03	3,677
Waterberg		7.64	2,317	13.43	2,027	6.58	2,371
	Bela-Bela	9.62	1,535	13.49	1,299	5.74	1,771
	Lephalale	9.12	2,848	13.31	1,272	8.60	3,040
	Modimolle-Mookgophong	17.98	1,863	18.68	1,806	16.04	2,018
	Mogalakwena	5.61	2,307	7.46	3,258	5.46	2,234
	Thabazimbi	14.06	1,370	14.79	1,170	13.34	1,570

Appendix C: Assessment of Productive Rural Regions

District municipality	Node or settlement	Criteria in respect of productive rural region					
		Score	National connectivity	Provincial connectivity	Urban–rural and rural–rural connectivity	Function and service	Economic development potential
Capricorn	Polokwane	100%	5	5	5	5	5
Waterberg	Mokopane	100%	5	5	5	5	5
Mopani	Tzaneen	96%	5	5	4	5	5
Vhembe	Thohoyandou	96%	5	5	5	4	5
Capricorn	Mankweng	96%	5	4	5	5	5
Waterberg	Bela-Bela	92%	4	5	5	4	5
Vhembe	Makhado	88%	5	5	4	3	5
Vhembe	Phalaborwa	88%	5	5	3	4	5
Mopani	Namakgale	84%	5	5	3	4	4
Mopani	Giyani	84%	5	5	3	3	5
Sekhukhune	Burgersfort/Tubatse	84%	4	5	4	3	5
Vhembe	Musina	84%	5	5	3	3	5
Waterberg	Modimolle	80%	4	5	3	3	5
Waterberg	Mookgophong	80%	4	5	3	3	5
Mopani	Hoedspruit	80%	5	5	3	3	4
Capricorn	Lebowakgomo	72%	0	5	5	3	5
Sekhukhune	Groblerdsdal	68%	0	5	3	4	5
Mopani	Nkowankowa	68%	5	4	4	1	3
Mopani	Lenyenye	68%	5	4	4	1	3
Vhembe	Malamulele	68%	3	4	5	1	4
Vhembe	Elim	64%	1	4	5	3	3
Sekhukhune	Driekop	60%	1	5	5	1	3

District municipality	Node or settlement	Criteria in respect of productive rural region					
		Score	National connectivity	Provincial connectivity	Urban–rural and rural–rural connectivity	Function and service	Economic development potential
Waterberg	Bakenberg	60%	3	3	5	1	3
Waterberg	Lephalale	60%	0	5	3	3	4
Waterberg	Thabazimbi	60%	0	5	3	3	4
Mopani	Gravelotte	56%	4	5	1	1	3
Mopani	Modjadjiskloof	56%	1	4	3	3	3
Sekhukhune	Marble Hall	56%	0	5	4	1	4
Sekhukhune	Atok	52%	3	4	4	1	1
Sekhukhune	Jane Furse	52%	1	1	5	3	3
Mopani	Ga-Kgapane	48%	1	1	4	3	3
Capricorn	Senwabarwana	48%	0	1	5	3	3
Capricorn	Mogwadi	44%	0	4	3	1	3
Waterberg	Northam	44%	0	4	3	1	3
Capricorn	Morebeng	44%	0	4	3	1	3
Capricorn	Alldays	44%	0	4	3	1	3
Sekhukhune	Ohrigstad	40%	0	5	1	1	3
Sekhukhune	Steelpoort	40%	0	3	3	1	3
Waterberg	Thabo Mbeki	36%	0	1	1	1	3
Key:							
	5	Extremely high/good					
	4	High/Very good					
	3	Medium/Moderate/Restricted					
	1	Low or doubtful					
	0	Insignificant or nothing					

