

GAMAGARA LOCAL MUNICIPALITY

Municipal Spatial Development Framework Review 2024-25

Phase 4 Report: Spatial Proposals



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Phase 2: Status quo analysis, policy
context and spatial vision

Phase 3: Spatial and sectoral analysis and
stakeholder consultation



Phase 4: Spatial proposals

Phase 5: Implementation framework and CEF

Phase 6: Final comprehensive SDF

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Contents

Contents	A
Glossary of Terms	D
Acronyms	H
Reference Table: SPLUMA Pillars and Spatial Planning Categories	J
1. Introduction	1
2. Gamagara Spatial Vision and Objectives.....	1
2.1 Lead-In and Rationale for Revision.....	1
2.2 Revised Spatial Vision (2025)	1
2.3 Refined Spatial Objectives	1
2.4 Alignment Matrix	3
2.5 Concluding Remarks	3
3. SWOT Response and Key Issues	5
3.1 Introduction	5
3.2 Strengths and Response	5
3.3 Weaknesses and Response	5
3.4 Opportunities and Response	5
3.5 Threats and Response	6
3.6 SWOT Response Matrix	6
3.7 Conclusion	9
4. Alignment with National, Provincial, Regional, District and Local Policies	10
4.1 Introduction	10
4.2 Alignment with National Frameworks	10
4.3 Alignment with the Northern Cape Provincial Framework.....	10
4.4 Alignment with Regional and District Frameworks	11
4.5 Alignment with Local Frameworks.....	11
4.6 Conclusion: Ensuring Vertical and Horizontal Policy Alignment	11
5. Spatial Structuring Development Framework Plan	12
5.1 Building Blocks of Gamagara's Spatial Structure	12
5.2 Functional Regions and Zones	12
5.3 Corridor Development	14
5.3.1 Corridor Functions and High-Order Corridors	14
5.3.2 N14 Corridor	15
5.3.3 R380 Corridor	17
5.3.4 Tourism Corridors: The Go-Ghaap! Route and Forgotten Highway 18	19
5.3.5 Conclusion	19
5.4 Nodes, Precincts and Sub-Municipal Functional Zones	19
5.4.1 Introduction	19
5.4.2 Kathu CBD Precinct.....	19
5.4.3 Gateway Nodes.....	21
5.4.4 Sesheng–Mapoteng Integration Zone	21
5.4.5 Olifantshoek CBD Precinct.....	22
5.4.6 Dibeng CBD Precinct.....	23
5.4.7 Conclusion	24
5.5 Urban Development Boundaries	25
5.5.1 Spatial Context.....	25
5.5.2 Key Opportunities and Considerations	25
5.5.3 Spatial Guidance/Directives	25
5.6 Conclusion	26
6. Biophysical Framework Development Plan	31
6.1 Introduction	31
6.2 Spatial Context.....	31
6.3 Key Opportunities and Considerations	31
6.4 Settlement-Level Biophysical Framework Plans.....	32
6.4.1 Kathu	32
6.4.2 Olifantshoek	33
6.4.3 Dibeng	33
6.4.4 Integrated Settlement Perspective	33
6.5 Spatial Guidance and Directives	33
6.6 Conclusion	34
7. Agricultural Framework Development Plan	42
7.1 Introduction	42
7.2 Spatial Context.....	42
7.3 Key Opportunities and Considerations	42
7.4 Settlement-Level Agricultural Considerations.....	42
7.5 Spatial Guidance and Directives	43
7.6 Conclusion	43
8. Tourism Framework Development Plan	46
8.1 Introduction	46
8.2 Spatial Context.....	46
8.3 Key Opportunities and Considerations	46
8.4 Settlement-Level Tourism Considerations.....	47
8.5 Spatial Guidance and Tourism	47
8.6 Conclusion	47

9. Renewable Energy Framework Development Plan.....	49		
9.1 Introduction	49	13.4.2 Provincial Alignment.....	73
9.2 Spatial Context.....	49	13.4.3 District Alignment	73
9.3 Key Opportunities and Considerations	49	13.4.4 SPLUMA Alignment.....	74
9.4 Spatial Guidance and Directives	51	13.5 Linking GLM Economic Frameworks to PSDF Drivers	74
9.5 Conclusion	51	13.5.1 Driver 1: Thriving Economic Engines	74
10. Mining and Manufacturing Framework Development Plan	53	13.5.2 Driver 2: Transforming Spaces and Livelihoods	74
10.1 Introduction	53	13.5.3 Driver 3: Conservation of Resource Production Areas	75
10.2 Spatial Context	53	13.5.4 Driver 4: Effective Spatial Governance	75
10.3 Key Opportunities and Other Considerations	53	13.5.5 Multi-Driver Synergies	75
10.4 Spatial Guidance and Directives.....	56	13.6 Composite Opportunity Matrix	77
10.5 Conclusion	56	13.7 Conclusion.....	77
11. Wholesale & Retail Trade Framework Development Plan	58	14. Human Settlements & Social Amenities Framework Development Plan 83	
11.1 Introduction	58	14.1 Introduction.....	83
11.2 Spatial Context	58	14.2 Spatial Context	83
11.3 Key Opportunities and Considerations.....	58	14.3 Key Opportunities and Considerations	83
11.4 Settlement-Level Considerations.....	61	14.3.1 Human Settlements	83
11.4.1 Kathu	61	14.3.2 Social Amenities	83
11.4.2 Olifantshoek	61	14.4 Settlement-Level Considerations	84
11.4.3 Dibeng	61	14.4.1 Kathu	84
11.5 Spatial Guidance and Directives.....	61	14.4.2 Olifantshoek	84
11.6 Conclusion	62	14.4.3 Dibeng.....	85
12. Education, Training and Finance Framework Development Plan	67	14.4.4 Babatas	85
12.1 Introduction	67	14.5 Spatial Guidance and Directives	85
12.2 Spatial Context	67	14.5.1 Human Settlements	85
12.3 Key Opportunities and Considerations.....	67	14.5.2 Social Amenities	86
12.4 Settlement-Level Considerations.....	68	14.5.2 Social Amenities	86
12.4.1 Kathu	68	14.6 Conclusion.....	87
12.4.2 Olifantshoek	68	15. Infrastructure Framework Development Plan	92
12.4.3 Dibeng	70	15.1 Introduction.....	92
12.4.4 Rural Areas and Communities.....	70	15.2 Spatial Context	92
12.5 Spatial Guidance and Directives.....	70	15.3 Key Opportunities and Considerations	92
12.6 Conclusion	70	15.4 Settlement-Level Considerations	93
13. Composite Economic Framework Development Plan	73	15.4.1 Kathu	93
13.1 Introduction	73	15.4.2 Olifantshoek	94
13.2 Spatial and Economic Context	73	15.4.3 Dibeng.....	95
13.3 Key Cross-Sectoral Insights	73	15.4.4 Babatas	95
13.4 Policy Alignment	73	15.5 Spatial Guidance and Directives	96
13.4.1 National Alignment.....	73	15.6 Conclusion.....	96
		16. Composite Built Environment Framework Development Plan	106

16.1	Introduction	106
16.2	Spatial Context	106
16.3	Key Opportunities and Considerations.....	106
16.4	Policy Alignment	107
16.5	Multi-Driver Synergies.....	107
16.6	Conclusion	107
17.	Spatial Governance Framework Development Plan	109
17.1	Introduction	109
17.2	Spatial Context	109
17.3	Key Opportunities and Considerations.....	109
17.4	Land Use Management Implications and Considerations	109
17.5	Spatial Guidance and Governance Directives	110
17.6	Conclusion	112
18.	Integrated Spatial Development Framework.....	113
18.1	Introduction	113
18.2	Integration Across Frameworks	113
18.3	Policy Alignment	113
18.4	Key Outcomes of Integration	114
18.5	Conclusion	114

Glossary of Terms

Agro-processing – The set of activities that transform agricultural products into processed goods, adding value and linking agriculture to manufacturing.

Biochar – A carbon-rich product obtained from heating biomass in a low-oxygen environment, used to improve soil fertility, sequester carbon, and support circular economy practices.

Biomass – Organic material derived from plants and animals, which can be used as fuel or raw material in energy production and bio-based industries.

Bioswale – A landscape element designed to concentrate or remove silt, pollutants, and stormwater runoff through natural vegetation and soils.

Built Environment – The human-made surroundings that provide the setting for human activity, including buildings, infrastructure, and public spaces.

Bulk Infrastructure – Large-scale, shared infrastructure (water treatment plants, bulk supply pipelines, electricity substations, major roads) that provides services to multiple settlements or developments.

Capital Development – Investment in infrastructure, facilities, and systems that create long-term assets for economic and social benefit.

Capital Expenditure (CAPEX) – Funds used by a municipality or organisation to acquire, build, renew or upgrade physical assets such as property, buildings, or infrastructure.

Capital Expenditure Framework (CEF) – A component of the MSDF and IDP that prioritises, sequences, and aligns infrastructure investment with spatial development priorities.

Carbon Border Adjustment Mechanism (CBAM) – A European Union policy tool that places tariffs on carbon-intensive products imported from outside the EU, incentivising decarbonisation in global supply chains.

Catalytic Project – A development intervention that stimulates further investment, unlocks opportunities, and has wider spatial and economic impacts beyond its immediate footprint.

Circular Economy – An economic model aimed at minimising waste and maximising resource use by reusing, recycling, and valorising waste streams into productive inputs.

Conservation – The protection, management, and restoration of biodiversity, ecosystems, and natural resources to ensure long-term sustainability.

Composite Economic Framework – An integrated set of sector-specific economic development strategies (agriculture, mining, renewable energy, manufacturing, retail, tourism, education/finance) that collectively support post-mining diversification and resilience in Gamagara.

Corridor Economy – An economic system in which development and investment concentrate along key transport and trade routes, creating spatially connected growth opportunities.

Critical Biodiversity Areas (CBAs) – Terrestrial and aquatic features critical for conserving biodiversity and maintaining ecosystem functioning.

Densification – The strategic increase in residential, commercial, or mixed-use density within existing urban areas to promote compact, efficient, and sustainable settlement patterns.

Development Finance Institution (DFI) – A government-backed financial institution that provides funding for developmental projects, often on concessional terms.

Developer Contribution Policy – A municipal policy requiring developers to contribute financially or in-kind to infrastructure provision, ensuring that new developments do not impose unsustainable burdens on municipal systems.

Dolomite Risk Management Strategy (DRMS) – A structured approach to managing development in dolomite-prone areas, ensuring compliance with SANS 1936 standards, and mitigating risks to people and property.

Ecological Support Areas (ESAs) – Areas that are not formally protected but are critical to supporting biodiversity, maintaining ecological processes, and sustaining ecosystem services.

Economic Leakage – The loss of local spending power when residents or businesses purchase goods and services outside of the local economy, weakening local economic multipliers.

Economic Sector – A distinct area of economic activity, such as agriculture, manufacturing, mining, tourism, renewable energy, or trade.

Experiential Farm – A farm that combines production with education and training, exposing learners and researchers to innovative agricultural practices such as wind-tunnel farming, hydroponics, and crops.

Gamagara Mining Corridor – A spatial concept describing the economic and spatial linkages between Gamagara, Tsantsabane, and Joe Morolong municipalities, anchored in mining and extending to diversification sectors.

Geotechnical Studies – Technical investigations into soil, rock, and groundwater conditions that determine the suitability of land for construction or upgrading.

Green Infrastructure – Natural and semi-natural systems (tree lines, bioswales, parks, wetlands) that deliver ecosystem services such as cooling, flood mitigation, and biodiversity support, while improving settlement liveability.

Gross Leasable Area (GLA) – The total floor area designed for tenant occupancy and exclusive use, including basements, mezzanines, and upper floors. Commonly used in retail property analysis.

Gross Value Add (GVA) – A measure of economic output that reflects the value of goods and services produced in an area, sector, or industry.

Human Settlements – The integrated network of housing, social amenities, infrastructure, and public spaces required to support sustainable communities.

Infill Development – The development of vacant or underutilised parcels of land within existing urban areas, contributing to compaction and efficient service use.

Infrastructure – The physical facilities and systems (roads, water, sanitation, energy, ICT) that support economic activity and social well-being.

Infrastructure Asset Management – A systematic process of planning, operating, maintaining, renewing, and disposing of infrastructure assets in a way that delivers required service levels sustainably and cost-effectively.

Integration Zone – A defined spatial area where coordinated interventions (housing, infrastructure, services, and economic investment) are targeted to overcome spatial fragmentation and promote inclusive growth.

Invasive Species Management – The control and productive use of alien invasive plants through fodder, biochar, or biomass industries, addressing environmental damage while creating economic opportunities.

Iron Ore Tailings – Residual material left after the beneficiation of iron ore, with potential for valorisation into construction materials, pigments, or other industrial uses.

Land Reform – A policy-driven process of redistributing, restoring, or securing land rights to promote equity, justice, and sustainable development.

Land Use Management Scheme (LUMS) – The municipal regulatory tool that prescribes permissible land uses and development controls such as density, height, and site coverage for different zones.

Local Area Plan – A detailed planning instrument that guides development within a smaller part of the municipality, such as a neighbourhood, town centre, or special precinct.

Neighbourhood Development Partnership Grant (NDPG) – A national grant aimed at supporting municipal infrastructure and development in township areas, particularly for catalytic economic and social infrastructure.

Nodes and Corridors – Spatial concepts defining concentrations of activity (nodes) and connecting routes (corridors) that structure development.

One Plan (District Development Model) – The single, integrated plan developed for each district municipality under the District Development Model (DDM), ensuring coordination across all spheres of government.

PHSHDA (Priority Human Settlements and Housing Development Area) – Nationally designated areas prioritised for coordinated housing and infrastructure investment to accelerate formalisation and service delivery.

Place-making – A collaborative process of creating quality public spaces that promote health, well-being, cultural identity, and community interaction.

Precinct Plan – A detailed plan for a defined urban area (e.g., town centre or CBD) that integrates land use, transport, urban design, and public environment upgrades.

Protected Area – An area designated under law to conserve biodiversity, ecosystems, or cultural heritage, managed for long-term sustainability.

Renewable Energy Development Zone (REDZ) – Geographically defined areas where renewable energy development is prioritised due to favourable environmental, social, and economic conditions.

Resilience – The ability of settlements, systems, and communities to absorb shocks (e.g., economic, environmental, social) and adapt to change without losing core functions.

Rural – Areas outside the urban footprint characterised by low-density settlement, agricultural activity, or natural landscapes.

Social Amenities – Community facilities (schools, clinics, libraries, community halls, sports fields) that contribute to quality of life and sustainable settlements.

Social Labour Plan (SLP) – A statutory instrument in the mining sector requiring companies to commit to social and labour development obligations for host and labour-sending communities.

Socio-Economic Development (SED) – Programmes and investments by the private sector, particularly mining and energy companies, aimed at improving the socio-economic well-being of communities.

Spatial Action Area (SAA) – A PSDF-defined area where coordinated interventions are prioritised to address spatial, economic, and social transformation.

Spatial Development Framework (SDF) – The principal spatial planning instrument of a municipality or province, providing a long-term spatial vision and guiding land use management.

Spatial Justice – The fair and equitable distribution of settlements, services, and opportunities across space.

Spatial Sustainability – The principle of promoting compact, efficient, resource-conscious settlement and land use patterns.

Strategic Asset Management Plan (SAMP) – A plan that sets out how a municipality will manage its infrastructure assets over their life cycle to deliver sustainable services.

SWOT Analysis – A diagnostic tool assessing strengths, weaknesses, opportunities, and threats in order to inform strategy.

Tyre Granulation – The process of breaking down used or discarded tyres into granules for reuse in road surfacing, playgrounds, or industrial products, reducing waste and supporting circular economy industries.

Urban Design – The discipline of designing and shaping urban environments, including buildings, public spaces, streets, and landscapes, to create functional, attractive, and sustainable settlements.

Urban Development Boundary (UDB) – A spatial line that defines the limits of urban expansion to contain sprawl, protect ecological assets, and align growth with infrastructure capacity.

Urban Sprawl – The uncontrolled outward expansion of urban development into rural or environmentally sensitive areas, often characterised by inefficient land use and costly service provision.

Value Capture – A land-based financing mechanism where increases in land value, resulting from public infrastructure or regulatory decisions, are partly recovered by the municipality to fund further infrastructure investment.

Workplace-Based Learning – Practical training conducted in real work environments, such as apprenticeships or learnerships, to prepare learners for employment.

Acronyms

ARC	Agricultural Research Council
CBA	Critical Biodiversity Area
CBAM	Carbon Border Adjustment Mechanism
CEF	Capital Expenditure Framework
COGHSTA	Northern Cape Cooperative Governance, Human Settlements and Traditional Affairs
CPA	Community Property Association
CSIR	Council for Scientific and Industrial Research
DALRRD	Department of Agricultural, Land Reform and Rural Development
DDM	District Development Model
DFI	Development Finance Institution
DRMS	Dolomite Risk Management Strategy
DWS	Department of Water and Sanitation
ECD	Early Childhood Development
EPWP	Expanded Public Works Programme

ESA	Ecological Support Area
EV	Electric Vehicle
GBIP	Gamagara Bulk Infrastructure Programme
GIS	Geographic Information System
GLA	Gross Leasable Area
GLM	Gamagara Local Municipality
GSSA	Gamagara Spatial Action Area
GVA	Gross Value Add
IDP	Integrated Development Plan
INEP	Integrated National Electrification Programme
JET	Just Economic Transition
JTGDM	John Taolo Gaetsewe District Municipality
KIP	Kathu Industrial Park
LED	Local Economic Development
LUMS	Land Use Management Scheme
MCPP	Municipal Capability Partnership Programme

MIG	Municipal Infrastructure Grant
MRIO	Multi-Regional Input-Output (Model)
MSDF	Municipal Spatial Development Framework
NBF	National Biodiversity Framework
NCR TVET	Northern Cape Rural Technical and Vocational Education and Training College
NDP	National Development Plan
NDPG	Neighbourhood Development Partnership Grant
NSDF	National Spatial Development Framework
PGDP	Provincial Growth and Development Plan (of the Northern Cape)
PHSHDA	Priority Human Settlement and Housing Development Area
PMO	Programme Management Office
PSDF	Provincial Spatial Development Framework
RBIG	Regional Bulk Infrastructure Grant
REDZ	Renewable Energy Development Zone
SAA	Spatial Action Area
SANBI	South African National Biodiversity Institute

SANRAL	South African National Roads Agency Limited
SANS	South African National Standard
SDF	Spatial Development Framework
SDGs	Sustainable Development Goals
SED	Socio-Economic Development
SIP	Strategic Infrastructure Project
SIOC	Sishen Iron Ore Company
SIOC CDT	Sishen Iron Ore Company Community Development Trust
SIVOS	Sishen Iron Ore Company Community Development Trust Technical Training Centre
SLP	Social Labour Plan
SMME	Small, Medium and Micro Enterprise
SPLUMA	Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)
SWOT	Strengths, Weaknesses, Opportunities and Threats
TVET	Technical and Vocational Education and Training
UDB	Urban Development Boundary

Reference Table: SPLUMA Pillars and Spatial Planning Categories

The Spatial Planning Categories (SPCs) provide a coherent framework to guide land-use decision-making at all levels of planning. They have been articulated to foster an organised and collaborative process that advances sustainable development in a structured and consistent manner. Importantly, the designation of SPCs does not alter existing zoning or land-use legislation; rather, they clarify and standardise decision-making, supporting the development of improved zoning schemes, laws, and regulations across the province. For this reason, it is advisable that all zoning scheme regulations be aligned with the SPCs. In this Spatial Proposals Report, all elements of the framework development plan maps have been explicitly linked to these categories, ensuring consistency, alignment, and ease of interpretation.

SPLUMA Pillars	Focus Areas	Spatial Planning Categories	Sub-Categories			
Biophysical	Agriculture; Land Transformation; Climate Change; Geology & Topography; Biodiversity & Ecosystems; Landscapes and Sense of Place	A. Core	A.a	Statutory Protected Areas		
		B. Buffer	B.a B.b	Non-Statutory Conservation Areas Ecological Corridors	B.c	Urban Green Areas
		C. Agricultural Areas	C.a	Extensive Agricultural Areas	C.b	Intensive Agricultural Areas
Socio-Economic	Regional Space Economy; Demographics & Social Conditions; Cultural Heritage & Tourism; Employment; Local Economy & Business; Key Economic Sectors; Rural Development	D. Urban Related	D.f D.g D.i D.j	Institutional Areas Authority Areas Business Areas Service-Related Business	D.k D.l D.m D.q	Special Business SMME Incubation Mixed Use Development Areas Resorts & Tourism Related Areas
Built Environment	Settlement Patterns; Settlement Role, Hierarchy & Function; Spatial Structure & Form; Built Heritage; Land Use & Activity Patterns; Infrastructure; Transport & Movement Networks; Housing	D. Urban Related	D.a D.b D.c D.d D.e	Main Towns Local Towns Rural Settlements Tribal Authority Settlements Communal Settlements	D.h D.n D.o D.p D.r	Residential Areas Cemeteries Sports Fields & Infrastructure Airport & Infrastructure Farmsteads & Outbuildings
		E. Industrial Areas	E.a E.b E.c	Agricultural Industry Industrial Development Zone Light Industry	E.d E.e	Heavy Industry Extractive Industry
		F. Surface, Industrial & Utility Buildings	F.a F.b F.c F.e F.f F.f F.g	National Roads Main Roads Minor Roads Public Streets Heavy Vehicle Overnight Facilities Railway Lines Power Lines	F.h F.i F.j F.k F.l F.m	Telecommunication Infrastructure Renewable Energy Structures Dams & Reservoirs Canals Sewerage Plants & Refuse Areas Mixed Use Development Areas

These categories form the organising structure for all spatial proposals in Gamagara, ensuring that the municipality's future development is guided by a consistent, transparent, and sustainable framework for land-use planning and decision-making.

1. Introduction

Phase 4 of the Gamagara MSDF Review represents the strategic turning point from analysis to proposals. Informed by the policy analysis (Phase 2, Part 1), the status quo and SWOT assessment (Phase 2, Part 2), and the spatial analysis (Phase 3), the proposals respond directly to the challenges of mine closures, climate change, service pressures, and spatial inefficiencies. They also integrate the draft 2025 Local Economic Development (LED) Strategy proposals, which provides an updated set of mine-closure scenarios and economic diversification pathways.

Phase 4 therefore sets out a comprehensive framework of spatial proposals to guide growth, restructuring, and resilience, aligned with national, provincial, regional, district and local policy directives.

2. Gamagara Spatial Vision and Objectives

2.1 Lead-In and Rationale for Revision

In the Phase 2: Status Quo Analysis and Policy Context Report, a draft spatial vision and objectives were prepared to provide an initial strategic direction for the review of the Municipal Spatial Development Framework (MSDF). Since then, further work has sharpened the municipality's understanding of its challenges and opportunities.

The Phase 3: Spatial and Sectoral Analysis provided detailed insights into settlement patterns, accessibility of social amenities, infrastructure performance, and the long-term implications of mine closures. In parallel, the Local Economic Development (LED) Strategy (2025) introduced updated mine closure scenarios, catalytic projects, and diversification pathways. Importantly, the Northern Cape Provincial Spatial Development Framework (PSDF) and its spatial proposals for the Gamagara Spatial Action Area were also considered in refining the local vision and objectives, ensuring vertical alignment between provincial and municipal planning.

Against this backdrop, the spatial vision has been revised to respond more clearly to mine closure risks, climate change, and infrastructure pressures while embracing new economic opportunities. Similarly, the spatial objectives have been refined following the Phase 3 spatial analysis. They now provide a more detailed, implementable

framework for guiding land use and development, and are explicitly aligned both with the five development principles set out in the Spatial Planning and Land Use Management Act (SPLUMA), 2013 and the spatial drivers of the Northern Cape PSDF.

2.2 Revised Spatial Vision (2025)

“A resilient, inclusive, and well-connected municipality that leverages its mining legacy, unique landscapes, and emerging economic opportunities to create sustainable settlements, diversify the economy, and ensure a high quality of life for all.”

This vision acknowledges the risks of mine closures and the urgency of diversification, while recognising that spatial planning must enable inclusive settlement development, protect ecological assets, and strengthen Gamagara's role in the Northern Cape's corridor economy.

It also aligns with the Gamagara Economic Vision from the LED Strategy: *“A resilient, inclusive and future-fit economy beyond mining – rooted in our people, place and potential.”*

2.3 Refined Spatial Objectives

Objective 1: Manage the transition from mining dependence.

The first objective seeks to ensure that Gamagara's land use, infrastructure, and settlement planning actively facilitate the municipality's transition away from mining dependence. This includes planning for post-mining land repurposing, renewable energy development, and industrial diversification so that communities are not left vulnerable to mine closure shocks. It is directly aligned with the SPLUMA principle of Spatial Resilience, which requires flexibility to withstand and adapt to economic disruption.

The primary alignment PSDF alignment is with Driver 1: Thriving Economic Engines, specifically its elements on Mining and Mineral Beneficiation, Manufacturing and Industrial Development, Renewable Energy and Green Hydrogen, Logistics and Trade, and Tourism Development. These are the levers through which Gamagara can transition its economy. Secondary alignment exists with Driver 2: Transforming Space

and Livelihoods, where education and reskilling are necessary to support workforce transitions into new industries.

Objective 2: Consolidate and strengthen settlements.

The second objective emphasises the need to promote compact, functional, and well-serviced settlements. Kathu, Dibeng, and Olifantshoek will remain the three main urban centres, while the Babatas Community Property Association (CPA) settlement is recognised as a small but important human settlement requiring basic services and integration into municipal systems. By focusing on existing centres and structured small settlements, Gamagara ensures fiscally responsible, environmentally sound, and socially inclusive growth. This gives effect to the SPLUMA principle of Spatial Sustainability, which emphasises viable settlements and containment of sprawl.

The primary PSDF alignment is with Driver 2: Transforming Space and Livelihoods, which promotes compact growth, integration, and the strengthening of settlements and PHSHDA areas. Secondary alignment exists with Driver 1: Thriving Economic Engines, where viable nodes underpin economic investment, and with Driver 3: Protection and Expansion of Ecological Infrastructure, where compact settlements reduce pressure on ecological systems.

Objective 3: Promote inclusive access to land, housing, and social amenities.

The third objective aims to expand the supply of housing across income groups, thereby making housing more affordable in what is currently a heated property market with limited supply. This is critical not only to meet demand but also to provide options for different lifestyle needs, which is especially important in a mining economy characterised by a large transient and migrating workforce. By increasing the availability of affordable and diverse housing, Gamagara will reduce housing pressures, stabilise the market, and create a more inclusive and attractive living environment.

This objective gives effect to the SPLUMA principle of Spatial Justice, ensuring that all residents, including those in PHSHDA areas and informal settlements, gain equitable access to land, housing, and services. The primary PSDF alignment is with Driver 2: Transforming Space and Livelihoods, which calls for equitable settlement development and integrated human settlements that accommodate a diversity of income groups and needs.

There are also important secondary alignments. With respect to Driver 1: Thriving Economic Engines, sufficient affordable housing will enable employees to live within Gamagara rather than commuting daily from neighbouring municipalities. This not only reduces economic leakage by retaining spending locally but also improves productivity, stabilises the labour force, and supports retail and service economies.

With respect to Driver 3: Protection and Expansion of Ecological Infrastructure, expanded local housing supply will reduce the extensive daily travel and carbon emissions currently associated with commuting from outside municipalities. Moreover, the spatial proposals go beyond resource-efficient housing design to also require resource-efficient design, management, and operations for social amenities and infrastructure systems, improving environmental performance and climate resilience. This integrated approach to housing and services ensures that settlement growth is both socially inclusive and environmentally sustainable.

Objective 4: Safeguard biodiversity and ecological assets.

The fourth objective emphasises protection of Gamagara's ecological assets, including the Kathu Camel Thorn Forest, critical biodiversity areas, and water systems, while mainstreaming climate adaptation into planning. This reflects the SPLUMA principle of Spatial Sustainability.

The primary alignment is with Driver 3: Protection and Expansion of Ecological Infrastructure, which requires safeguarding biodiversity, expanding ecological infrastructure, and integrating green systems into urban areas. Secondary alignment exists with Driver 1: Thriving Economic Engines, where eco-tourism depends on intact natural assets, and with Driver 2: Transforming Space and Livelihoods, where environmental education and conservation initiatives strengthen human capacity.

Objective 5: Position Gamagara as a logistics, industrial, renewable energy, and tourism hub.

The fifth objective seeks to strengthen Gamagara's role as a regional economic node along the N14 Industrial Corridor and R380 Forgotten Highway/Go-Ghaap! Route, through investment in logistics, renewable energy, manufacturing, and tourism. This reflects the SPLUMA principle of Spatial Efficiency, ensuring optimal use of existing networks and infrastructure.

The primary PSDF alignment is with Driver 1: Thriving Economic Engines, particularly the elements of Logistics and Trade, Manufacturing and Industrial Development, Renewable Energy and Green Hydrogen, and Tourism and Cultural Economy.

Secondary alignment exists with Driver 2: Transforming Space and Livelihoods, where tourism and industrial growth must be accompanied by skills platforms, and with Driver 3: Protection and Expansion of Ecological Infrastructure, where eco- and cultural tourism depend on safeguarded landscapes.

Objective 6: Strengthen governance, land use management, and urban design quality.

The sixth objective ensures that spatial governance is predictable, transparent, and aligned with long-term strategies. This includes urban development boundaries, land use scheme refinements, and design guidelines to foster investor confidence, coherent settlement growth, and improved urban quality. It is anchored in the SPLUMA principle of Good Administration, which requires municipalities to provide transparent, integrated, and accountable spatial governance.

The primary PSDF alignment is with Driver 4: Effective Spatial Governance, which emphasises the importance of capable institutions, consistent and predictable land-use management systems, alignment across spheres of government, and integrated spatial governance to enable delivery.

Secondary alignment exists with Driver 1: Thriving Economic Engines (providing investor certainty and predictable rights), Driver 2: Transforming Space and Livelihoods (ensuring equitable planning and delivery of social infrastructure), and Driver 3: Protection and Expansion of Ecological Infrastructure (embedding ecological considerations into governance systems and land use management).

2.4 Alignment Matrix

The Gamagara spatial objectives are not only responsive to the development principles of SPLUMA but also straddle several of the Northern Cape PSDF drivers, enhancing their overall strength. This dual responsiveness ensures that local proposals are both legislatively compliant and strategically aligned across governance levels. The table below summarises these alignments, highlighting the primary PSDF driver for each objective, with secondary alignments noted.

2.5 Concluding Remarks

The revised spatial vision and objectives establish the foundation for all proposals contained in this Phase 4 report. They deliberately integrate Gamagara’s economic transition strategy, the analytical findings of Phases 2 and 3, the spatial drivers of the Northern Cape PSDF, and the development principles of SPLUMA. By ensuring that each objective is firmly rooted in local needs and opportunities while simultaneously aligned to provincial drivers and national legislation, the MSDF provides both legitimacy and strategic coherence.

The fact that each spatial objective responds to multiple PSDF drivers — while being anchored in the SPLUMA principles — enhances their robustness. This integrated approach ensures that proposals are not narrowly sectoral, but rather transformative in scope: resilient to shocks, inclusive in benefits, sustainable in environmental terms, efficient in infrastructure use, and well-governed through effective institutions.

Together, the spatial vision and objectives provide a strong foundation for guiding the spatial proposals in the sections that follow, ensuring that Gamagara is able to transition beyond mining while building inclusive, sustainable, and prosperous settlements.

TABLE 1: GLM SPATIAL OBJECTIVES ALIGNMENT MATRIX

GLM Objectives	Spatial	Supporting Frameworks	PSDF Drivers Advanced	SPLUMA Principles Advanced	Likely Outcomes
1. Diversify the economy beyond mining		Economic frameworks (Agriculture, Tourism, Renewable Energy, Mining & Manufacturing, Wholesale & Retail Trade, Finance); Built Environment (infrastructure to enable growth)	Driver 1: Thriving Economic Engines; Driver 2: Transforming Spaces (through job creation); Driver 3: Conservation (via circular economy); Driver 4: Effective Governance (through investor certainty)	Efficiency, Resilience, Sustainability, Good administration	Expanded economic base, reduced dependence on mining, net job creation, improved investor confidence
2. Enable sustainable, integrated settlements		Human Settlements & Social Amenities; Infrastructure; Spatial Structuring	Driver 2: Transforming Spaces and Livelihoods; Driver 1: Thriving Economic Engines (via affordable workforce housing); Driver 3: Conservation (through reduced commuting emissions)	Spatial justice, Efficiency, Sustainability	Formalised and upgraded townships, affordable housing options, improved integration across Sesheng–Mapoteng–Kathu and Olifantshoek/Dibeng, security of tenure
3. Protect and restore environmental assets		Biophysical Framework; Agriculture (invasive species valorisation, biochar); Infrastructure (asset renewal, stormwater resilience)	Driver 3: Conservation of Resource Production Areas; Driver 2: Transforming Spaces (through improved liveability); Driver 1: Thriving Economic Engines (via eco-tourism, green jobs)	Sustainability, Resilience, Spatial justice	Improved water security, rehabilitation of mining land, biodiversity conservation, climate-adaptive towns, creation of biodiversity reserves
4. Ensure infrastructure-led development		Infrastructure Framework; Built Environment composite	Driver 1: Thriving Economic Engines; Driver 2: Transforming Spaces; Driver 4: Effective Governance	Efficiency, Sustainability, Good administration, Resilience	Bulk water augmentation, upgraded sanitation, electricity reliability, resilient stormwater and roads, improved operating margins from reduced water losses, safer communities
5. Enhance governance capacity and transparency		Spatial Governance Framework (LUMS, GIS, institutional strengthening, Mine–Municipal Compact)	Driver 4: Effective Spatial Governance; Driver 1: Thriving Economic Engines (via investor certainty); Driver 2: Transforming Spaces (through participatory planning)	Good administration, Justice, Efficiency	Predictable and transparent processes, improved land use enforcement, strengthened intergovernmental coordination, investor confidence
6. Build social and human capital		Human Settlements & Social Amenities (schools, ECDs, parks, sports); Education & Training Framework	Driver 2: Transforming Spaces and Livelihoods; Driver 1: Thriving Economic Engines (through skills for future industries)	Spatial justice, Resilience, Sustainability	Expanded education facilities, youth skills development, safer and more liveable communities
7. Position Gamagara as a regional hub		Spatial Structuring; Economic frameworks (Trade, Finance); Infrastructure (air, rail, roads, industrial nodes – KIP, Farm 736, Bestwood)	Driver 1: Thriving Economic Engines; Driver 4: Effective Governance; Driver 2: Transforming Spaces (through service access for region)	Efficiency, Sustainability, Good administration	Kathu consolidated as regional mining and services hub, growth of logistics and retail trade, improved regional connectivity
8. Safeguard biodiversity and ecosystem services		Biophysical Framework; Agriculture; Social Amenities (community-managed conservation areas, tree coverage)	Driver 3: Conservation of Resource Production Areas; Driver 2: Transforming Spaces (through green open spaces for communities)	Sustainability, Resilience, Justice	Expanded green corridors, community-managed conservation areas, increased tree coverage, improved urban resilience and attractiveness
9. Strengthen governance and design quality of settlements		Spatial Governance; Human Settlements & Social Amenities (precinct planning, CBD renewal)	Driver 4: Effective Governance; Driver 2: Transforming Spaces	Good administration, Efficiency, Sustainability, Resilience	Precinct plans implemented (Kathu CBD, Dibeng, Olifantshoek), consistent zoning (LUMS review), improved urban design standards, safer and more attractive towns

3. SWOT Response and Key Issues

3.1 Introduction

The Phase 2 report set out a detailed SWOT analysis of Gamagara's current spatial, social, economic, and environmental conditions. This analysis provided a structured understanding of the municipality's strengths, weaknesses, opportunities, and threats, and highlighted the issues that must be addressed through the spatial proposals of Phase 4. By responding directly to the SWOT, the MSDF ensures that its proposals are both evidence-based and targeted to the most critical developmental challenges facing the municipality.

3.2 Strengths and Response

Gamagara benefits from several inherent strengths: it has a globally significant iron ore cluster centred on Kathu, excellent transport and logistics infrastructure including the N14, R380, the Sishen-Saldanha Bay Iron Ore railway line and Sishen Airport, exceptional solar irradiance and renewable energy potential, and unique natural and cultural assets such as the Camel Thorn Forest and the Kgosi Toto Caves. These strengths form the building blocks of diversification.

The Phase 4 spatial proposals deliberately build on these advantages. The Spatial Structuring Framework reinforces the N14 and R380 as strategic corridors, with gateway nodes and CBD upgrades that capitalise on Gamagara's connectivity. Renewable energy zones, industrial parks, and logistics hubs are integrated into the land-use framework to leverage economic infrastructure capacity. Ecological and heritage assets are protected through the Biophysical and Environmental Framework, while being activated as anchors for eco-tourism and cultural tourism. In this way, the municipality's spatial planning enables its strengths to be harnessed for long-term resilience and opportunity creation.

3.3 Weaknesses and Response

Despite its many strengths, Gamagara faces significant internal weaknesses. Settlement patterns remain fragmented, with Kathu, Sesheng, and Mapoteng poorly integrated into a single functional urban system. Infrastructure networks are under

strain due to rapid mining-driven urbanisation, while service delivery remains uneven, particularly in PHSHDA areas and informal settlements. Fiscal vulnerability and heavy reliance on mining revenue further constrain the municipality's capacity to deliver and maintain infrastructure.

The Phase 4 proposals respond to these weaknesses by placing emphasis on consolidation, integration, improved urban design, and more efficient land-use management. To manage growth, the municipality will introduce short-term and medium- to long-term urban development boundaries. These will contain sprawl, direct investment into existing settlements, and ensure that infrastructure provision remains efficient and financially sustainable.

Furthermore, the development of Local Area Plans (LAPs) along the N14 and R380 corridors will not only harmonise land uses and improve functional connectivity between Kathu, Sesheng, and Mapoteng, but will also deliberately position these settlements to strengthen and benefit from the emerging corridor economy. In this way, the LAPs ensure that settlement restructuring directly supports Gamagara's economic diversification trajectory while enhancing quality of life for residents.

Investments in social amenities, housing, and PHSHDA areas are also spatially prioritised to address uneven service provision and improve inclusivity. Collectively, these measures target fragmentation, enhance integration, and build a more fiscally and spatially efficient settlement structure.

3.4 Opportunities and Response

The SWOT analysis highlighted a range of opportunities that, if actively pursued, can enable Gamagara to diversify its economy and restructure its settlement form. Key opportunities include Gamagara's role in the Northern Cape's Green Hydrogen and Renewable Energy Corridors, the potential of the Kathu Industrial Park and Farm 736 industrial development, the growth of sports, education and eco- and heritage tourism markets, and the ability to unlock mixed-income housing demand through catalytic projects such as the Kathu 5700 development.

The Phase 4 spatial proposals actively seize these opportunities. The Spatial Structuring Framework reinforces the N14 and R380 as development corridors, supported by LAPs that ensure spatial integration, high-quality urban design, and alignment with the corridor economy. These corridors are positioned as the backbone

for investment in logistics, renewable energy, tourism, and industrial development, consistent with the PSDF’s provincial growth directives.

Housing and settlement restructuring are advanced through the designation of PSHDA areas, where large-scale, mixed-income housing can be delivered. This not only unlocks latent housing demand but also provides a foundation for inclusive communities and construction-led economic growth. By explicitly responding to affordability and the lifestyle needs of a transient mining workforce, Gamagara is able to stabilise its settlement system and retain household expenditure within the local economy.

Tourism opportunities are activated through the Tourism Development Framework, which integrates heritage, sports, and education-based tourism. Investments such as the revitalisation of Khai Appel, the Langeberg hiking trail, and the Kgosi Toto Cave link directly to the Go-Ghaap! Route and Forgotten Highway tourism spines, strengthening Gamagara’s identity as a cultural and eco-tourism destination.

Finally, the municipality’s abundant solar resources and strategic grid connections create significant opportunities for renewable energy projects. The Phase 4 proposals proactively earmark land and corridors for such investments, ensuring that Gamagara is well-positioned to capture the emerging energy economy.

3.5 Threats and Response

The SWOT analysis identified a set of long-term threats that could undermine the resilience of Gamagara if not managed proactively. The most pressing of these is mine closures, which would have severe impacts on employment, municipal revenue, and settlement stability. Other threats include water scarcity, projected climate change impacts (with localised temperature increases of 3.5–5°C by 2050), environmental degradation from mining legacies, and the risk of uncontrolled growth and informality if housing demand is not adequately addressed.

The Phase 4 spatial proposals respond by embedding resilience and adaptability into the settlement and land-use framework. Urban Development Boundaries (UDBs), set at short and medium- to long-term horizons, will contain sprawl, guide phased growth, and ensure that limited municipal resources are deployed efficiently. This provides predictability for investment while mitigating the fiscal risks associated with uncontrolled expansion.

LAPs along the N14 and R380 corridors will address land-use conflicts and provide the structure for orderly, integrated development. By creating attractive, investment-ready precincts, the LAPs not only mitigate the risk of urban dysfunction but also position Gamagara to capture opportunities from the emerging corridor economy, buffering against mine-closure shocks.

At the same time, Priority Human Settlement and Housing Development Areas (PHSHDA) are identified as focal points for mixed-income housing delivery. By meeting housing demand locally, the municipality reduces the risk of uncontrolled informal expansion, while also addressing economic leakage by enabling mine employees and service workers to live within Gamagara rather than commuting daily from neighbouring municipalities.

Environmental threats are also directly addressed. The Biophysical and Environmental Framework safeguards biodiversity and ecological infrastructure, mandates climate-adapted urban design and infrastructure, and integrates water conservation and demand management measures. Mine closure remediation and the rehabilitation of degraded areas, including the Asbestos “No-Go” Area, further strengthen ecological resilience.

In combination, these proposals ensure that Gamagara is not only better prepared for future threats but actively turns them into opportunities for restructuring and diversification. By coupling proactive planning tools (UDBs, LAPs, PSHDA) with ecological safeguards, the MSDF positions the municipality to withstand shocks, adapt to new realities, and sustain the wellbeing of its residents in the decades ahead.

3.6 SWOT Response Matrix

The SWOT analysis highlighted Gamagara’s unique combination of strengths, weaknesses, opportunities, and threats. For the MSDF to be effective, it must not only describe these dynamics but also respond to them in ways that are spatially grounded and practically implementable. The table below summarises how each category of the SWOT analysis is addressed through the Phase 4 spatial proposals. It demonstrates that the proposals are not generic solutions but direct responses, supported by clear spatial tools such as UDBs, LAPs, PSHDA, and tailored development frameworks. Together, these responses ensure that Gamagara’s spatial strategy is evidence-based, future-ready, and capable of turning risks into opportunities.

TABLE 2: SWOT RESPONSE MATRIX

Strengths	How to Capitalise
Strategic location within the Northern Cape and along the N14 corridor	Strengthen Gamagara's role as the regional hub for mining services, logistics, and retail trade, while leveraging the Kathu CBD Precinct Plan and Bestwood development to anchor corridor growth
Established mining cluster with global companies and supply chains	Support diversification into downstream beneficiation, renewable energy manufacturing, and eco-industrial parks, while maintaining Gamagara as the regional mining services hub
Existing transport infrastructure (Sishen–Saldanha rail, Sishen airport, regional roads)	Improve regional logistics platform, upgrade road and rail interfaces, and support the growth of warehousing and vehicle dealerships along the N14
Renewable energy resources and approved REIPPPP projects	Expand renewable energy sector, establish maintenance and manufacturing services in Kathu Industrial Park, and link to education and tourism initiatives (Solar Horizons Week)
Ecological and cultural assets (Camel Thorn Forest, reserves, heritage sites)	Promote eco- and cultural tourism, enhance biodiversity reserves through mining land rehabilitation, and strengthen settlement liveability with urban greening and tree lines
Weaknesses	How to Address
Over-reliance on mining revenue and jobs	Diversify economy across six targeted sectors (agriculture, renewable energy, tourism, retail, manufacturing, education & finance)
Housing shortages and high property/rental costs in Kathu	Expand affordable and higher-density housing (Residential III zoning), activate Kathu 5700 and Mapoteng PSHDA, expand long-term rental options
Informality and settlement fragmentation (especially Olifantshoek, Dibeng, Sesheng & Mapoteng)	Formalise and upgrade informal settlements where feasible; deproclaim and rezone high-risk areas (flood lines) to Public Open Space
Infrastructure vulnerabilities: vandalism, water/electricity losses, inadequate renewal	Scale up asset renewal, adopt new technologies (borehole bunkers, pipe replacement), enforce maintenance strategies, and improve institutional asset management systems
Weak land use management (accommodative zoning, spaza proliferation, Residential IV misuse)	Review and amend LUMS to standardise zoning, prohibit further Residential IV, regulate spaza shops, and align zoning with precinct plans

Opportunities	How to Realise
Agricultural diversification (pistachio, pecan nuts, livestock, hydroponics)	Establish large-scale orchards with linked processing facilities, introduce circular practices (biochar, prosopis valorisation), and create an experiential farm with academic partners
Retail and wholesale trade expansion	Leverage Kathu's disposable incomes and weekly mining influx, expand retail cautiously with retail impact assessments, and grow warehousing/logistics with EV charging
Renewable energy transition	Develop service and manufacturing hub in Kathu, recycle decommissioned panels in future, link to education, training and workforce reskilling programmes
Tourism growth (eco-tourism, events, education, sports)	Develop concepts from the LED Strategy (Desert Torque, Tree Festival, Taste of the Kalahari), improve town entrances and wayfinding, partner with sports associations to create compliant facilities
Spatial governance reforms	Review and update LUMS, enforce by-laws, expand GIS/evidence systems, and strengthen the Mine–Municipal Compact for alignment and resource pooling
Threats	How to Mitigate
Mine closures and economic contraction	Accelerate diversification across six sectors, secure early investment, and implement LED Strategy to create net job growth before closures materialise
Climate change: water scarcity, heat, extreme weather	Invest in GBIP and RBIG bulk water schemes, implement water conservation and demand management, expand tree coverage, and design climate-adaptive amenities
Dolomite and flood-prone settlement risks	Apply Dolomite Risk Management Strategy (SANS 1936), rezone high-risk areas to Public Open Space, and enforce “no development in flood lines” controls
Landfill airspace depletion (Dibeng site ~6 years remaining)	Develop new regional waste management solutions, accelerate recycling and waste-to-value industries, and implement circular economy practices
Risk of retail oversupply	Require urban retail assessments for all shopping centre applications larger than neighbourhood scale in Kathu over the next five years

Taken together, these responses provide the strategic bridge from the diagnostic assessment to the detailed framework development plans that follow, ensuring that the MSDF is firmly rooted in evidence while charting a clear path toward Gamagara's long-term spatial vision.

3.7 Conclusion

The SWOT analysis provided a critical lens for identifying the municipality's developmental challenges and opportunities. By directly responding to each quadrant through spatial objectives and proposals, the Phase 4 report ensures that planning is grounded in evidence and oriented towards practical solutions.

Strengths are leveraged, weaknesses are corrected, opportunities are captured, and threats are mitigated. This balanced response lays the groundwork for a spatial strategy that is realistic, resilient, and transformative — positioning Gamagara to navigate its post-mining transition while building an inclusive and sustainable future.

4. Alignment with National, Provincial, Regional, District and Local Policies

4.1 Introduction

Spatial planning in South Africa requires alignment both vertically (between national, provincial, district, and municipal levels) and horizontally (across sectors at each level). For Gamagara, alignment ensures that spatial proposals are not only locally appropriate but also consistent with broader strategies for economic transition, inclusive and sustainable human settlement development, spatial justice, environmental protection and reclamation, and climate resilience.

The Phase 2 Policy Analysis Report provided a comprehensive review of legislation, policies, and plans relevant to Gamagara at national, provincial, regional, and district levels. The Phase 4 proposals are therefore aligned with this full suite of frameworks. However, this section highlights only the most critical frameworks that have directly shaped the spatial proposals — ensuring clarity of focus while recognising the wider policy environment.

4.2 Alignment with National Frameworks

At the national level, the National Development Plan (NDP 2030) sets out the vision of an inclusive, resilient, and sustainable economy, while the National Spatial Development Framework provides the spatial framework for achieving this vision through compact settlements, corridor development, and climate resilience. Importantly, the NSDF positions Gamagara within the North-Western Spatial Transformation Corridor, a nationally significant development axis focused on resource-based economies, renewable energy, and logistics connectivity.

The Gamagara Phase 4 spatial proposals advance these national priorities by:

- ▶ Promoting compact, integrated settlements through short- and medium- to long-term Urban Development Boundaries (UDBs) and targeted housing delivery in PSHDA areas.

- ▶ Reinforcing corridor-based development via Local Area Plans (LAPs) for the N14 and R380, positioning Gamagara within both the national and provincial corridor economies.
- ▶ Embedding climate resilience in the Biophysical and Environmental Framework, which safeguards biodiversity, mandates resource-efficient settlement and infrastructure design, and promotes adaptation to rising temperatures and water scarcity.

These alignments give practical local effect to the SPLUMA principles of Spatial Justice, Sustainability, Resilience, and Efficiency.

4.3 Alignment with the Northern Cape Provincial Framework

The Northern Cape Provincial Spatial Development Framework establishes four overarching spatial drivers:

1. Driver 1: Thriving Economic Engines.
2. Driver 2: Transforming Space and Livelihoods.
3. Driver 3: Protection and Expansion of Ecological Infrastructure.
4. Driver 4: Effective Spatial Governance.

The Phase 4 objectives and proposals align strongly with these drivers:

- ▶ Driver 1: Gamagara is positioned as a logistics, industrial, renewable energy, and tourism hub, with land earmarked for catalytic projects such as the Kathu Industrial Park, Farm 736, and renewable energy/green hydrogen zones.
- ▶ Driver 2: Settlement restructuring is advanced by consolidating Kathu, Dibeng, Olifantshoek, and Babatas, delivering PSHDA housing, and ensuring access to social amenities.
- ▶ Driver 3: The Camel Thorn Forest, CBAs, and water systems are safeguarded, with climate adaptation mainstreamed into planning.
- ▶ Driver 4: Predictable governance is promoted through UDBs, refined land use schemes, and Local Area Plans that integrate land-use, transport, and infrastructure planning.

4.4 Alignment with Regional and District Frameworks

At the district scale, the John Taolo Gaetsewe District Spatial Development Framework (JTG SDF), IDP and the District One Plan provide the strategic framework for transition from mining dependence towards a diversified and sustainable economy. They emphasise innovation, future-fit economies, inclusive access to services, settlement integration, and improved governance.

The Gamagara proposals are fully consistent with these priorities by:

- ▶ Supporting district diversification through renewable energy, tourism, logistics, and manufacturing linked to corridor economies.
- ▶ Enhancing settlement integration, especially in the Kathu–Sesheng–Mapoteng area, where LAPs and UDBs will manage orderly growth and ensure access to services.
- ▶ Promoting inclusive infrastructure investment, prioritising PHSHDA housing areas and aligning bulk infrastructure delivery (via the Gamagara Bulk Infrastructure Programme, GBIP) with district priorities.
- ▶ Reinforcing the District One Plan, particularly its emphasis on innovation, climate resilience, spatial justice, and institutional capacity as enablers of long-term sustainability.

4.5 Alignment with Local Frameworks

At the municipal level, the proposals align with and reinforce:

- ▶ The Gamagara Integrated Development Plan (IDP), which prioritises settlement restructuring, housing delivery, and infrastructure-led development.
- ▶ The Local Economic Development (LED) Strategy 2025, which sets out the diversification roadmap. All six LED sectors — renewable energy, manufacturing, logistics, mining and beneficiation, wholesale and retail trade, and tourism — are spatially enabled in the MSDF.
- ▶ Sectoral and programme plans, including the Gamagara Bulk Infrastructure Programme (GBIP), housing strategies, and the tourism events programme, which are incorporated into the spatial framework through designated zones, nodes, and PHSHDA areas.

4.6 Conclusion: Ensuring Vertical and Horizontal Policy Alignment

The Phase 4 spatial proposals are aligned with the broad set of legislation, policies, and plans identified in the Phase 2 report. Within that wider framework, this section has emphasised the key national, provincial, district, and local frameworks most critical to Gamagara's future development.

By explicitly responding to SPLUMA's principles, aligning with the NDP 2030 and NSDF (including positioning within the North-Western Spatial Transformation Corridor), advancing the four PSDF drivers, and reinforcing the priorities of the JTG IDP, SDF, and District One Plan, the Gamagara MSDF ensures coherence across governance levels. This layered alignment provides confidence that local proposals will not only address Gamagara's post-mining transition but also meaningfully contribute to broader regional, provincial, and national development agendas.

5. Spatial Structuring Development Framework Plan

5.1 Building Blocks of Gamagara's Spatial Structure

Every town and region grows around a set of structuring elements that determine its shape, efficiency, and opportunities. For Gamagara, these structuring elements are its corridors of movement, nodes of activity, and carefully managed urban development boundaries. Together, they provide the skeleton upon which the municipality's economic diversification, settlement growth, and environmental stewardship will depend.

Corridors do more than simply link towns—they position Gamagara within a larger regional and sub-national system. At the highest scale, Gamagara forms part of the North-Western Transformation and Transition Region identified in the National Spatial Development Framework, a zone prioritised for green energy, logistics, and industrial diversification. At a provincial level, Gamagara is embedded within the Gamagara Spatial Action Area of the Northern Cape PSDF, which recognises the municipality's central role in post-mining diversification and energy transition. At the sub-regional scale, Gamagara, and Kathu specifically, anchors the Gamagara Mining Corridor.

At the district scale, Gamagara is the core of the Gamagara Mining Corridor, which stretches along the N14 and R380 and integrates mining operations, renewable energy plants, logistics infrastructure, and associated settlements. These broader structuring systems confirm that Gamagara's corridors are not only local movement spines but also strategic connectors that tie the municipality into national trade flows, regional energy corridors, and district-level development patterns.

Nodes anchor services and investment, from the Kathu CBD to Dibeng and Olifantshoek. Urban development boundaries safeguard compact growth, protect sensitive land, and ensure services can be provided efficiently.

This framework sets out not just where development should occur, but how it should be structured to achieve three core aims:

1. **Integration** – linking settlements, economies, and infrastructure into one system.

2. **Focus** – directing investment into nodes and corridors where it will have the greatest impact.
3. **Resilience** – managing land use so that Gamagara grows compactly, sustainably, and inclusively.

In short, the Spatial Structuring Development Framework provides the spatial foundation for all subsequent frameworks—biophysical, economic, human settlement, and infrastructure.

5.2 Functional Regions and Zones

Before considering corridors, nodes, and urban development boundaries, it is critical to recognise that Gamagara's spatial form is nested within larger functional regions and zones. These macro-level structuring elements define the municipality's strategic role in the provincial and national spatial economy and shape the opportunities available for diversification.

At the broadest level, Gamagara is situated within the North-Western Transformation and Transition Region, one of the National Spatial Development Framework's priority regions. This region is targeted for large-scale investment in energy transition, industrial diversification, and logistics connectivity, positioning it as a future growth pole for South Africa.

Within the Northern Cape Provincial Spatial Development Framework, Gamagara forms part of the Gamagara Spatial Action Area (GSAA) (see **Figure 1**). The purpose of the GSAA is to act as a regional diversification hub, balancing intensive mining activity with emerging renewable energy, logistics, manufacturing, and tourism functions. Its key functions include consolidating the mining economy, promoting value addition through beneficiation and green industrialisation, and integrating new settlement growth with infrastructure planning. Opportunities within the GSAA include leveraging the N14 Industrial Corridor, expanding renewable energy production, diversifying into agro-processing and eco-tourism, and managing land use transitions in anticipation of mine closures.

Another defining spatial structuring element is the Gamagara Mining Corridor (see **Figure 1**), which, despite its name, functions less as a narrow linear axis and more as a mineral-rich regional zone that extends south–north across three municipalities. The corridor stretches from Tsantsabane Municipality in the south, through Gamagara Municipality at its centre, and up into Joe Morolong Municipality in the north.

FIGURE 1: GAMAGARA SPATIAL ACTION AREA AND MINING CORRIDOR

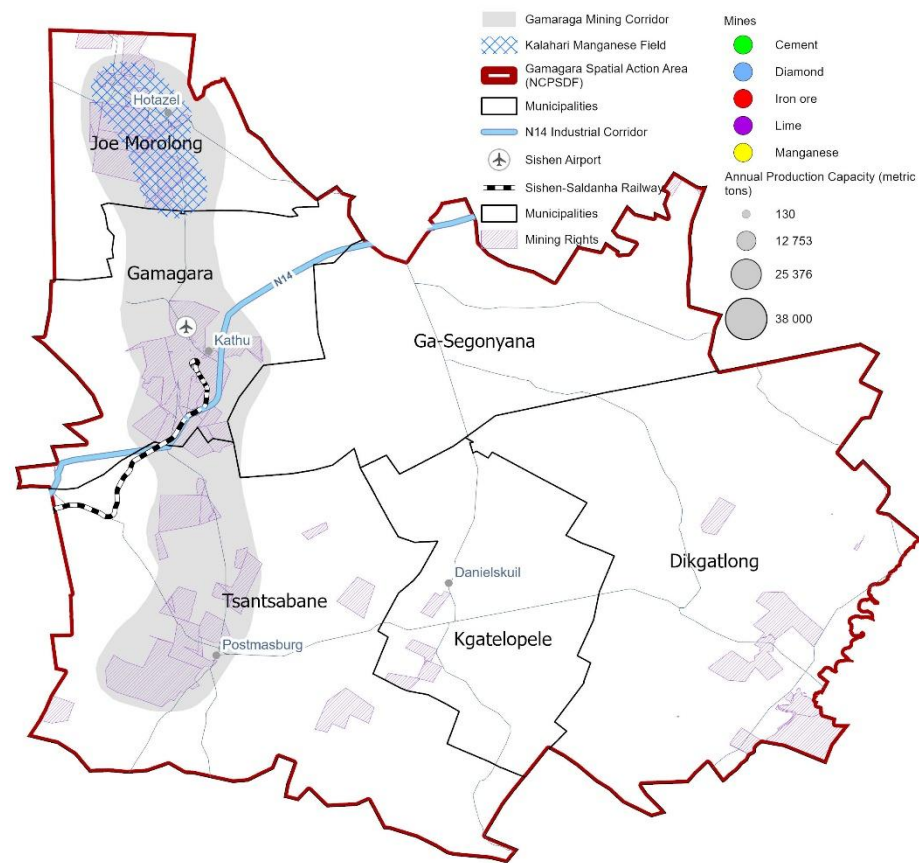
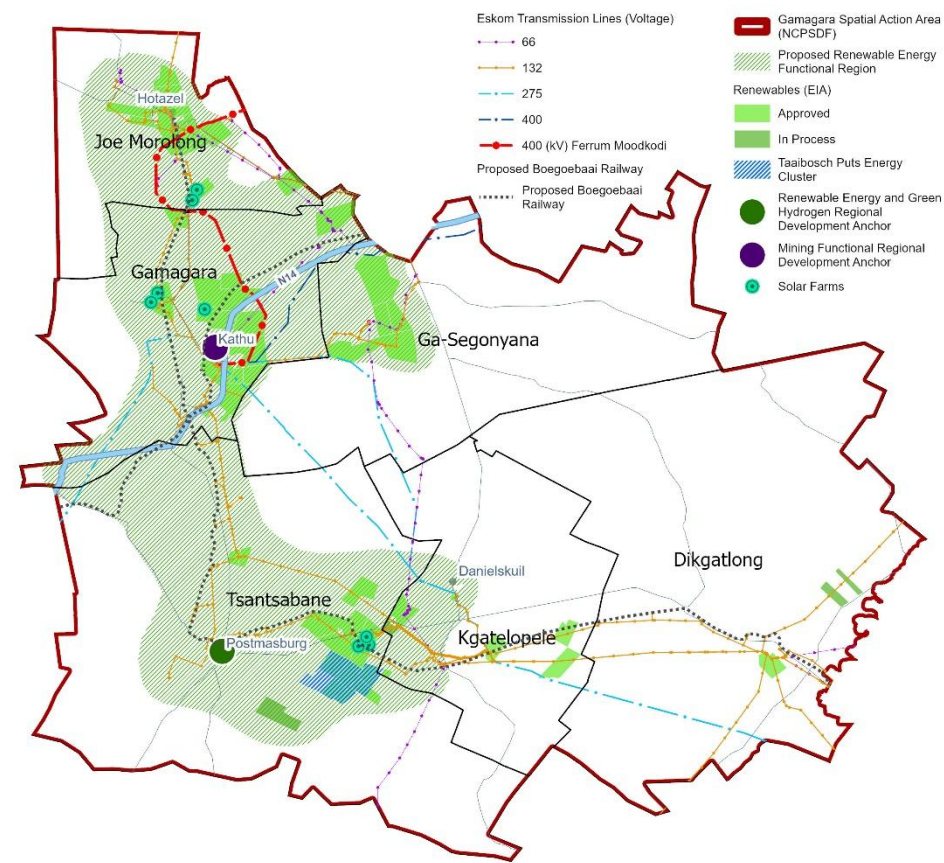


FIGURE 2: GAMAGARA-TSANTSABANE RENEWABLE ENERGY DEVELOPMENT ZONE



Within this corridor, the southern and central portions are dominated by iron ore mining, particularly in Tsantsabane and Gamagara. The northern portion transitions into manganese mining, concentrated around Hotazel in Joe Morolong. The largest and most strategic mine within the corridor is the Sishen Iron Ore Mine, located immediately adjacent to Kathu. As one of the largest open-pit iron ore mines globally, Sishen produces approximately 36 million metric tons of iron ore annually, anchoring both the local economy of Gamagara and the broader regional economy.

Mining is the undisputed economic backbone of the John Taolo Gaetsewe District, with Kathu functioning as the regional mining node. The corridor's influence, however, extends beyond JTG: it also anchors the economy of the neighbouring Tsantsabane Municipality, which is located within the ZF Mgcawu District Municipality and where iron ore extraction and beneficiation are likewise dominant. Together, these interconnected mining centres form the core of South Africa's iron and manganese belt, and their performance directly shapes the economic fortunes of the Northern Cape Province.

While this corridor underpins current prosperity, it also underscores Gamagara's central challenge: as ore bodies deplete and global markets shift, the municipality must prepare for an eventual post-mining transition. For this reason, the Mining Corridor is not only a spatial structuring element of current economic strength, but also the most critical spatial risk factor driving the need for diversification, renewal, and transition planning across the district and beyond.

Complementing this mining geography is the Gamagara–Tsantsabane Renewable Energy Development Zone, an emerging but powerful informal functional cluster of renewable energy projects, substantiated by Department of Environmental Affairs approvals and Eskom transmission infrastructure. Gamagara currently hosts four operational solar plants of 75–100 MW each, while Tsantsabane hosts three and Joe Morolong two smaller facilities. DEA has approved a further 28 projects in Gamagara and 21 in Tsantsabane, several of which are already advancing through town planning. Anchoring this cluster is the Taaibosch Puts Energy Cluster in Tsantsabane, with nine solar plants, three wind farms, and major hydrogen and ammonia facilities. Once operational, this cluster will add over 1,300 MW of renewable generation and substantial volumes of green hydrogen, ammonia, and oxygen, consolidating the region's role as a world-class green industrial hub.

The significance of this energy cluster for Gamagara cannot be overstated. It provides the municipality with a **new functional zone of opportunity**, linked spatially to

transmission corridors (including the planned Ferrum–Moodhoki 400 kV line) and economically to green industrialisation. It directly informs the spatial proposals of the Renewable Energy Framework Plan and the Mining and Manufacturing Framework Plan, but also has strong implications for the Agricultural, Tourism, and Training & Finance frameworks, as the renewable economy shapes demand for new skills, services, and complementary industries.

These overlapping functional regions and zones — the North-Western Transformation Region, the Gamagara Spatial Action Area, the Mining Corridor, and the Renewable Energy Development Zone — together frame Gamagara's spatial role and opportunities. They confirm the municipality as a regional anchor of national significance, whose future depends on harnessing mining wealth while pivoting toward renewable energy, green industry, and corridor-based development.

While this section highlights the macro-scale functional regions and zones that extend beyond Gamagara's boundaries, it is important to note that spatial structuring also occurs at the sub-municipal scale. Within Gamagara, smaller functional regions and zones emerge around precincts, gateways, and nodes, where land use intensity, infrastructure networks, and catalytic projects combine to create distinctive spatial patterns. These sub-municipal structuring elements are dealt with in Section 5.4 under Nodes and Precincts, ensuring that the macro-regional context and the localised spatial dynamics are integrated into one coherent framework.

5.3 Corridor Development

5.3.1 Corridor Functions and High-Order Corridors

Corridors are linear development axes that typically follow major national and provincial roads or railways, but they may also align with bulk infrastructure lines such as Eskom transmission corridors. They connect settlements, economic activities, and infrastructure systems, while structuring the spatial form of regions.

Corridors perform several key functions. They facilitate mobility and logistics, enabling the movement of goods, people, and services. They attract linear investment and settlement growth due to their visibility and accessibility. They support economic clustering, with manufacturing, logistics, retail, and tourism tending to locate along them. Finally, they provide structuring links that connect local settlements to the wider economy.

Corridors are therefore far more than transport routes. They are the spines of the corridor economy, enabling trade, logistics, industry, and tourism to cluster and thrive along key movement axes.

In Gamagara, the N14 and R380 road corridors, together with the Go-Ghaap! and Forgotten Highway tourism routes and the Sishen–Saldanha Iron Ore Railway line, are central to structuring the municipality's spatial form and unlocking its post-mining diversification potential.

These corridors link Gamagara to the North-Western Transformation and Transition Region at national scale, embed it within the Gamagara Spatial Action Area (GSAA) at provincial scale, consolidate its role as the economic anchor of the Gamagara Mining Corridor, and integrate it into the emerging Gamagara–Tsantsabane–Joe Morolong Renewable Energy Functional Zone. The overarching objective is to support and benefit from the development of the corridor economy, positioning Gamagara as a logistics, manufacturing, tourism, and service hub, while also ensuring that corridors contribute to settlement integration, improved gateways, and a more coherent urban structure.

These overlapping functional regions and zones — the North-Western Transformation Region, the Gamagara Spatial Action Area, the Gamagara Mining Corridor, and the Gamagara–Tsantsabane Renewable Energy Development Zone — frame Gamagara's spatial role and opportunities at the macro scale. Together, they confirm the municipality's status as a regional anchor of national significance, situated at the intersection of mining, energy, logistics, and heritage economies.

Looking forward, Gamagara's ability to harness the wealth of its mining corridor, pivot toward renewable energy, and integrate into regional transformation zones will determine its success in building a resilient, diversified economy. These macro regions set the stage for local structuring elements — corridors, nodes, and precincts — to translate regional opportunity into tangible, place-specific investment and growth.

5.3.2 N14 Corridor

5.3.2.1 Spatial Context

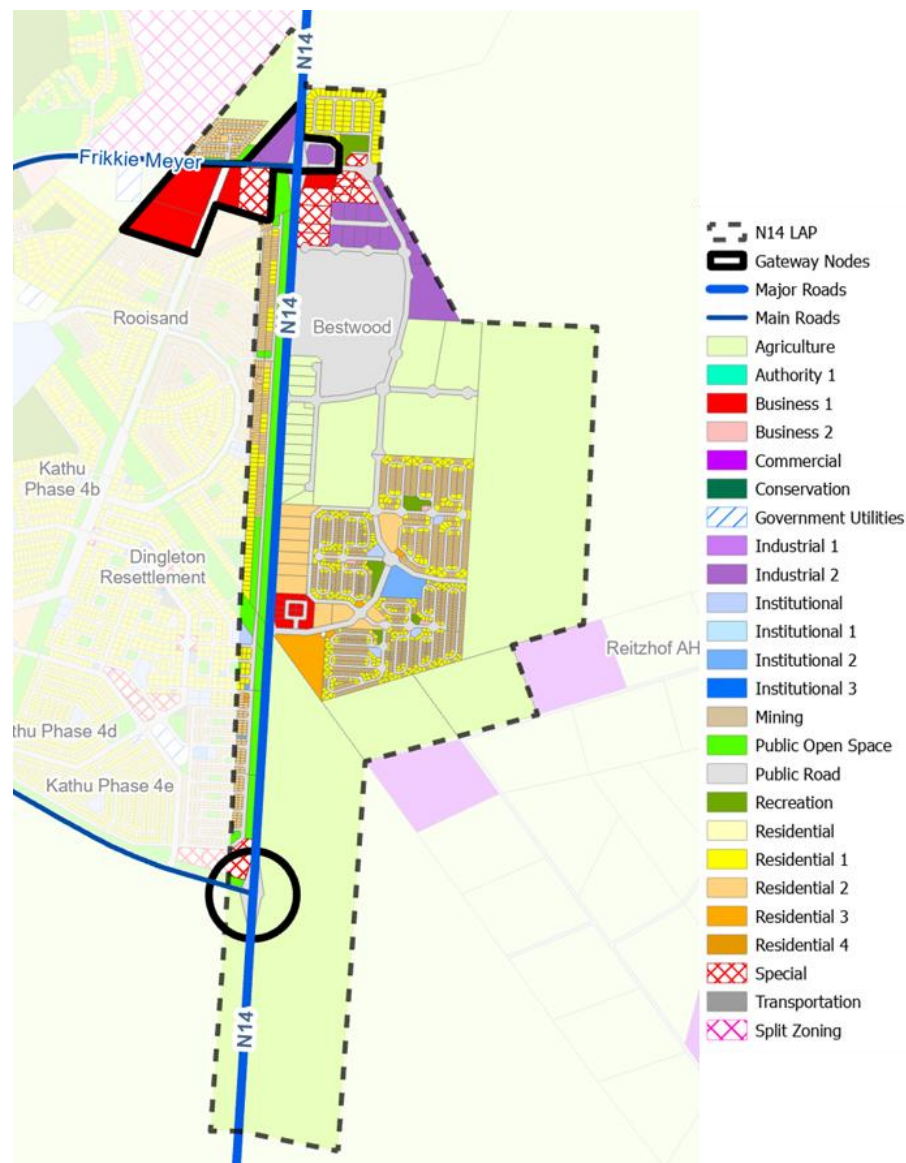
The N14 is the municipality's most strategic corridor. It functions simultaneously as a national trade and hydrogen corridor, a logistics and industrial spine, and a proposed tourism route. At national scale, it forms part of the NSDF's North-Western Transformation Region, linking Gamagara westwards to Upington and Namibia and eastwards to Gauteng. At provincial scale, it is the backbone of the Gamagara Spatial Action Area, recognised in the PSDF as a priority investment corridor. At municipal scale, it is the axis along which Kathu has developed as the regional mining and logistics node, and on which its future logistics, retail, and service functions depend.

5.3.2.2 Key Opportunities and Considerations

Kathu is particularly well placed to both strengthen and benefit from the N14 corridor economy. Its position enables it to capture flows of logistics, manufacturing, large-format retail, and tourism. To maximise these benefits, the Kathu/N14 Gateway Corridor Precinct will be created, extending from the N14/Frikkie Meyer intersection in the north to the N14/R380 T-junction in the south (see **Figure 3**). This precinct will intensify land use along the N14 and allow Kathu to leverage the corridor's economic advantages, benefitting from logistics, trade, business, and tourism flows.

As a secondary but important consideration, the Kathu/N14 Gateway Corridor Precinct will also improve the functional connectedness between Kathu to the west of the N14 and the relatively new Bestwood mixed-use development to the east. In doing so, it will prevent the fragmentation of the urban form and enable greater functional integration across the N14.

FIGURE 3: KATHU/N14 GATEWAY CORRIDOR PRECINCT



5.3.2.3 Spatial Guidance/Directives

The following spatial directives are motivated by the N14's multiple functions: it is the lifeline of the current mining economy, the pathway into future-fit economies that will shape the post-mining transition, and the means to ensure functional integration between Kathu and Bestwood:

1. **Target and prioritise development along the N14 Corridor**, focusing primarily on Kathu as the regional anchor, but secondarily on Olifantshoek to ensure it benefits from corridor-linked retail and tourism.
2. **Establish a Petroport** on the N14 between Kuruman and Kathu, supported by logistics services.
3. **Prioritise the installation of an electric vehicle (EV) charging station** along the N14 within Gamagara's boundaries, aligning with the green transition and decarbonisation of the local economy and supply chains.
4. **Designate the Kathu/N14 Gateway Corridor Precinct as Urban Development Zone 2** in the municipal spatial framework and land use scheme to be reviewed.
5. **Prepare a Local Area Plan (LAP) for the Kathu/N14 Gateway Corridor Precinct** with the following directives:
 - ▶ **Primary purpose:** Strengthen the N14 corridor economy and enable Kathu to capture logistics, manufacturing, wholesale and retail, and tourism flows.
 - ▶ **Secondary purpose:** Improve connectedness and integration between Kathu and the Bestwood development.
 - ▶ **Provide a blueprint for the desired spatial structure**, including transport networks, character zones, and an appropriate land use mix.
 - ▶ **Land use mix:** Prioritise high-end light manufacturing, logistics facilities, large-format retail (including vehicle showrooms and servicing centres), travel and tourism accommodation, and medium-density housing — with particular emphasis on land uses that benefit from visibility to passing traffic.
 - ▶ **Urban design guidelines:** Ensure attractive frontages, coherent integration of planned land uses, and strong linkages north to Kathu/Bestwood and south to the N14/R380 axis. Design should not only meet functional needs but also project a strong gateway image for Kathu as a regional mining, manufacturing, and tourism node. Landscaping, signage, and branding should reinforce this role and align with the municipality's aspirations to be recognised as the

gateway city of the Northern Cape's mining and renewable energy belt.

Through these interventions, the N14 will not only sustain its role as a mining logistics axis but will also evolve into a **diversified, future-fit corridor economy** that integrates Kathu with Bestwood, strengthens regional identity, and projects Gamagara's role within the North-Western Transformation Region.

5.3.3 R380 Corridor

5.3.3.1 Spatial Context

The R380 corridor extends north–south along the western edge of Kathu, connecting the Sishen Airport in the north with the N14 in the south, and functions as a strategic movement spine for both mining logistics and community access. It also serves as the development axis for an emerging industrial complex comprising three key components: the existing Kathu Extension 2 Industrial township, the planned Kathu Industrial Park to its south, and the planned Farm 736 industrial development to its north. Together, these projects will form a consolidated industrial precinct of regional significance, strategically located on the R380.

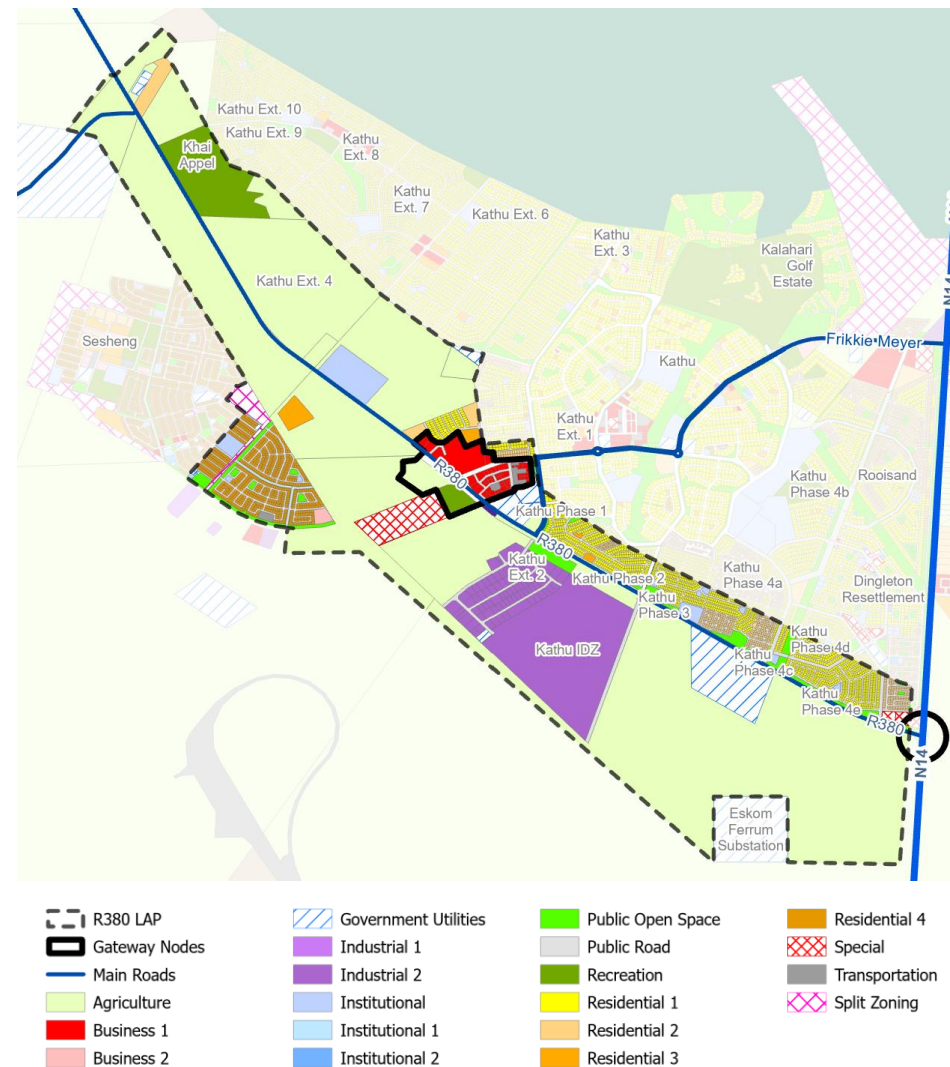
5.3.3.2 Key Opportunities and Considerations

The R380 presents an opportunity to create a coherent, integrated mixed-use corridor that combines mining-related industry, logistics, housing, and community services. By consolidating and expanding the planned industrial complex, the municipality can establish a regional hub for manufacturing and beneficiation, linked both to the mining economy and to renewable energy opportunities. At the same time, the corridor provides an opportunity to address urban fragmentation by functionally linking Kathu, Sesheng, and Mapoteng, thereby supporting inclusive growth and settlement integration. The Hendrik van Eck intersection is identified as the anchor gateway node for this corridor.

Equally important, the R380 is earmarked for the development of a regional education and sports precinct, clustered around the existing stadium. This precinct is intended to accommodate facilities such as a high-performance swimming pool complex and other sports and learning infrastructure, positioning Kathu as a regional centre of excellence in both education and sports. Such investments will not only strengthen

social services coverage but will also catalyse sports and education tourism, reinforcing Gamagara's identity as a diversified, future-oriented municipality. Complementary to this, the revitalisation of Khai Appel Resort provides an additional tourism asset that aligns with the corridor's emerging multifunctional role.

FIGURE 4: KATHU/R380 GATEWAY CORRIDOR PRECINCT



5.3.3.3 Spatial Guidance/Directives

The spatial guidance for the R380 corridor is shaped by its multi-faceted role: as a strategic logistics and industrial axis, as a local integration spine linking Kathu with Sesheng and Mapoteng, and as the location of a regional education and sports precinct. The creation of the Kathu/R380 Gateway Corridor Precinct, anchored at the Hendrik van Eck intersection, provides the framework for guiding development along this corridor (see **Figure 4** for the demarcated boundaries of this precinct). The directives below aim to consolidate the industrial complex, unlock inclusive settlement integration, strengthen education and sports infrastructure, and enhance the visual and functional quality of the corridor so that it projects a strong, investable identity in line with Gamagara's transition to a more diversified and future-fit economy.

1. Designate the Kathu/R380 Gateway Corridor Precinct as Urban Development Zone 3 in the municipal spatial framework and the land use scheme to be reviewed.
 2. Prepare a Local Area Plan (LAP) for the Kathu/R380 Gateway Corridor Precinct, extending from Sishen Airport in the north to the N14 in the south, with the Hendrik van Eck intersection as its anchor node.
 3. Consolidate the industrial complex along the corridor by integrating the existing Kathu Extension 2 Industrial township, the planned Kathu Industrial Park, and the Farm 736 industrial development into a single functional industrial precinct of regional significance.
 4. Resolve conflicting land uses by harmonising zoning into a coherent structure that balances industrial expansion with residential, recreational, and service functions.
1. Develop a regional education and sports precinct around the Kathu stadium, including facilities such as a high-performance swimming pool complex and related sports and learning infrastructure, to strengthen social service provision and support education and sports tourism.
 2. Improve transport networks and access, including direct access to the Kathu 5700 mixed housing development, and ensure adequate road capacity for intensified industrial activities along the corridor.
 3. Leverage tourism opportunities by aligning corridor development with the upgrading of the Khai Appel Resort and by integrating corridor branding with the Forgotten Highway and Go-Ghaap! Heritage Route.
 4. Apply urban design improvements to enhance the corridor's aesthetics, establish an attractive and investable image, and reinforce the corridor's identity as both a gateway and an integration zone.

5.3.4 Tourism Corridors: The Go-Ghaap! Route and Forgotten Highway

5.3.4.1 Spatial Context

The Go-Ghaap! Heritage Route and Forgotten Highway traverse Gamagara, connecting its towns to a wider network of cultural, historic, and natural heritage destinations across the Northern Cape. These routes form part of provincial tourism strategies and position Gamagara as a gateway into the regional tourism economy. They connect local attractions—including Kathu's recreational assets, Olifantshoek's heritage sites, and Dibeng's eco-tourism potential—to a broader tourism circuit. At present, much of the municipality's tourism infrastructure was developed to serve mining populations and is underutilised on weekends and during holidays, creating a significant opportunity to repurpose and revitalise facilities for broader visitor use.

5.3.4.2 Key Opportunities and Considerations

The tourism corridors provide a platform to diversify Gamagara's economy and strengthen its identity beyond mining. Investment opportunities include the revitalisation of the Khai Appel resort in Kathu, the upgrading of the Kgosi Toto caves and Langeberg hiking trail in Olifantshoek, and the creation of a tourism information and wayfinding system to market local accommodation, cultural attractions, and events. Strengthening the gateway entrances of Kathu, Olifantshoek, and Dibeng through landscaping, signage, and branding will reinforce their visibility to passing traffic and enhance their appeal as visitor destinations.

5.3.4.3 Spatial Guidance/Directives

The spatial guidance for the tourism corridors aims to position Gamagara as a distinctive gateway destination by leveraging its cultural and natural heritage, expanding its hospitality and recreational offerings, and strengthening its sports and retail infrastructure. In doing so, the municipality will not only enhance its visibility but also secure a stronger foothold within the regional visitor economy as a vibrant, diversified tourism hub.

1. Prioritise catalytic tourism projects, including the revitalisation of Khai Appel Resort (Kathu), and the activation of the Kgosi Toto Caves and Langeberg Trail (Olifantshoek).
2. Enhance town entrances for Kathu, Olifantshoek, and Dibeng through landscaping, signage, and branding that project a strong tourism identity.

3. Introduce a tourism information and wayfinding system, signposting attractions, accommodation, and events along the corridors.
4. Integrate tourism-supportive land uses into Local Area Plans for the N14 and R380 corridors, ensuring that tourism contributes to a diversified urban form.
5. Promote public–private partnerships with local businesses, mines, and provincial tourism bodies to activate and sustain tourism development along the corridors.

The spatial guidance for the tourism corridors aims to position Gamagara as a distinctive gateway destination by leveraging its cultural and natural heritage, expanding its hospitality and recreational offerings, and strengthening its sports and retail infrastructure. In doing so, the municipality will not only enhance its visibility but also secure a stronger foothold within the regional visitor economy as a vibrant, diversified tourism hub.

5.3.5 Conclusion

Taken together, the N14, R380, and Tourism Corridors form a multi-layered structuring system that positions Gamagara as both a regional anchor and a gateway to wider economic and tourism networks. The N14 integrates the municipality into national and provincial corridor economies, strengthening Kathu's role as a logistics and industrial hub. The R380 consolidates an industrial complex of regional significance, links Kathu with Sesheng and Mapoteng, and accommodates a new education and sports precinct that will enhance social services and attract sports and education tourism. The Forgotten Highway and Go-Ghaap! Heritage Route diversify Gamagara's identity, projecting it into the tourism economy and connecting its towns to cultural and natural heritage destinations.

Managing these corridors in tandem will allow the municipality to capture new flows of trade, logistics, tourism, and investment, while also ensuring that corridors reinforce settlement integration, gateways, and urban design quality. In this way, the corridor economy becomes the foundation of Gamagara's post-mining transition—anchoring industrial and energy diversification, unlocking inclusive settlement growth, and positioning the municipality as a future-fit, vibrant gateway city within the Northern Cape and the wider North-Western Transformation Region.

5.4 Nodes, Precincts and Sub-Municipal Functional Zones

5.4.1 Introduction

If corridors are the spines of Gamagara's spatial structure, then nodes and precincts are the anchors. These are concentrated points of activity where commerce, services, logistics, and tourism converge, providing focal points for investment and identity.

In addition to individual nodes and precincts, sub-municipal functional zones emerge within the municipality. These zones are smaller than the macro-regions described in Section 5.2, but they are critical to shaping Gamagara's urban form and development pattern. They include the Kathu CBD precinct, the Olifantshoek CBD precinct, the Dibeng CBD precinct, the Kathu/N14 Gateway Corridor Precinct, the Kathu/R380 Gateway Corridor Precinct, and integration areas such as the Sesheng–Mapoteng growth corridor. Together, these nodes, precincts, and zones provide the local building blocks of Gamagara's spatial economy, reinforcing the structuring role of larger corridors and regional zones.

5.4.2 Kathu CBD Precinct

5.4.2.1 Spatial Context

The Kathu CBD is the municipality's primary node of economic and social activity. It accommodates the bulk of Gamagara's retail, financial, administrative, and service functions, serving both local residents and the wider region. However, the CBD also faces challenges, including traffic congestion, ageing infrastructure, and the need for reinvestment in urban design to enhance its attractiveness and competitiveness.

5.4.2.2 Key Opportunities and Considerations

The Kathu CBD is strategically positioned to consolidate and expand its role as a regional service hub. Reinforcing this function requires targeted investment in infrastructure upgrades, improved access into and within the precinct, more efficient management of both vehicle and pedestrian movement, and better provision for parking. Revitalising the public realm and optimising the mix of commercial, civic, and residential land uses will create a more attractive, functional, and resilient centre.

Strengthening the CBD in this way will also enhance inclusive access to services, enabling it to function not only as a commercial core but also as a civic and community anchor that remains active over extended hours and throughout weekends. Ultimately, the Kathu CBD precinct must evolve from a place of single-purpose, short-duration visits into a multi-dimensional experience, encouraging longer stays and greater visitor immersion.

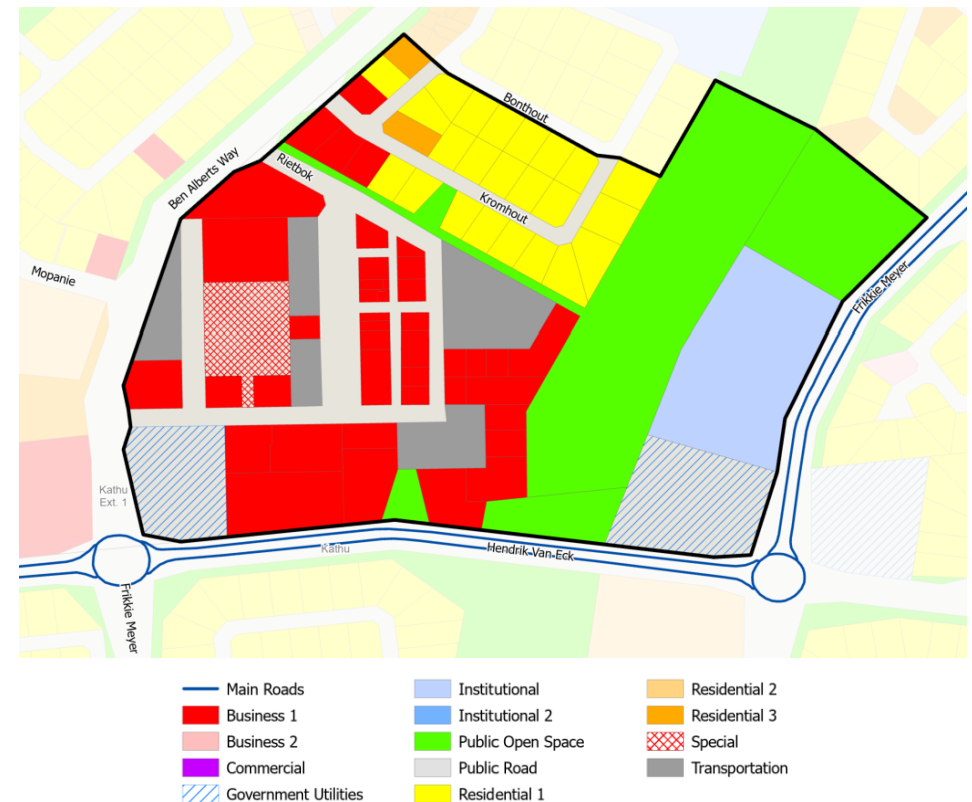
5.4.2.3 Spatial Guidance/Directives

The spatial guidance for the Kathu CBD is guided by its role as the municipality's primary regional service hub and its potential to transform into a multi-dimensional urban experience. Building on the precinct plan already developed, the directives below aim to implement the proposed interventions, reinforce the CBD's role as Urban Development Zone 1 (see **Figure 5**), and ensure that land use management, infrastructure, and urban design improvements collectively create a vibrant, inclusive, and investable centre for the municipality and the wider district.

1. **Reinforce the Kathu CBD as Urban Development Zone 1** in the municipal spatial framework and land use scheme.
2. **Amend the land use scheme** to give effect to this designation, enabling the mixed-use intensification, mobility upgrades, and public realm improvements envisioned in the precinct plan.
3. **Implement the Kathu CBD Precinct Plan** that has already been developed, ensuring its proposals for land use, transport, and urban design are realised in a phased but coordinated manner.
4. **Upgrade internal mobility systems**, including improved access routes into the precinct, reconfigured intersections, and enhanced pedestrian movement networks, with a focus on safety and universal accessibility.
5. **Rationalise and expand parking provision** to improve convenience, reduce congestion, and support longer-duration visits.
6. **Revitalise the public realm** through landscaping, lighting, public art, and signage, creating a more attractive and vibrant environment that encourages extended use of the CBD into evenings and weekends.
7. **Encourage mixed-use intensification** by integrating retail, offices, residential units, and civic functions to support a more active and diverse CBD.
8. **Support small businesses and informal traders** by providing designated trading areas within the precinct that are safe, accessible, and well-managed.

9. **Promote activation strategies** (such as events, markets, or cultural programming) to transform the CBD into a **multi-dimensional experience** that attracts both residents and visitors, encourages longer stays, and builds a stronger civic identity.

FIGURE 5: KATHU CBD PRECINCT



5.4.3 Gateway Nodes

5.4.3.1 Spatial Context

Three major **gateway nodes** are identified in Gamagara:

1. The **N14/Frikkie Meyer Gateway Node**, anchoring the Kathu/N14 Gateway Corridor Precinct.
2. The **R380/Hendrik van Eck Gateway Node**, anchoring the Kathu/R380 Gateway Corridor Precinct.
3. The N14/R380 Gateway Node, linking the N14 and R380 Corridors.

These nodes sit at the municipality's most strategic intersections, where corridor flows converge and where Gamagara has the greatest potential to capture logistics, retail, and investment flows.

5.4.3.2 Key Opportunities and Considerations

The gateway nodes must project a strong image for the municipality while also serving as engines of economic diversification. They provide an opportunity to cluster logistics, manufacturing, retail, and tourism-related land uses in highly visible locations, reinforcing Kathu's role as the gateway city of the Northern Cape's mining and renewable energy belt.

5.4.3.3 Spatial Guidance/Directives

The spatial guidance for the gateway nodes is centred on their role within Urban Development Zones 2 and 3 as focal points for corridor-based investment. The directives below aim to ensure that these precincts not only function efficiently but also present a strong and attractive image for Kathu and Gamagara.

1. Reinforce the **N14/Frikkie Meyer Gateway Node and Corridor Precinct** as **Urban Development Zone 2**.
2. Reinforce the **R380/Hendrik van Eck Gateway Node and Corridor Precinct** as **Urban Development Zone 3**.
3. **Amend the land use scheme** to align with these designations and enable mixed-use intensification at the designated gateway nodes.

4. Prepare detailed **Local Area Plans (LAPs)** for both corridor precincts, integrating land use, transport, and urban design.
5. Prioritise **gateway image-making** through landscaping, signage, and branding at these nodes.
6. Promote **high-visibility land uses** such as logistics depots, retail showrooms, hotels, and visitor services.

5.4.4 Sesheng–Mapoteng Integration Zone

5.4.4.1 Spatial Context

The settlements of Sesheng and Mapoteng, located south-east of Kathu, remain physically and functionally separated from the main town. Mapoteng has been earmarked as a Priority Human Settlement and Housing Development Area (PHSHDA), with substantial future housing delivery planned. The Hendrik van Eck Road, intersecting with the R380, provides the key structuring link between these settlements and Kathu, creating an opportunity to transform this corridor into an integration zone that supports inclusive growth, improved service access, and stronger connections between communities.

5.4.4.2 Key Opportunities and Considerations

The Sesheng–Mapoteng area presents one of the municipality's most significant opportunities for spatial transformation and social integration. With Mapoteng earmarked as a Priority Human Settlement and Housing Development Area (PHSHDA), large-scale housing delivery is planned that will accommodate future population growth. To succeed, this expansion must be supported by adequate bulk services, schools, health facilities, and community amenities.

The proximity of the R380 and Hendrik van Eck Road provides a natural structuring spine for mobility and development. By capitalising on this, the municipality can create a functional growth corridor that integrates Sesheng and Mapoteng more closely with Kathu, reducing current spatial separation and improving access to jobs, education, and services.

Importantly, this integration zone is not only about housing delivery — it offers the chance to establish mixed-use community nodes that combine residential, retail, and social functions. Such nodes will support vibrant, inclusive communities and help

transform Sesheng and Mapoteng from peripheral settlements into active and connected extensions of Kathu.

5.4.4.3 Spatial Guidance/Directives

The spatial guidance for the Sesheng–Mapoteng Integration Zone is driven by the need to reduce spatial fragmentation, ensure that planned housing delivery in Mapoteng is properly supported, and transform the R380–Hendrik van Eck axis into a growth and integration spine.

1. Designate the Sesheng–Mapoteng growth corridor as a sub-municipal functional zone within the R380 Corridor Precinct.
2. Support housing delivery in Mapoteng by ensuring it is phased in line with the availability of bulk infrastructure and complemented by schools, clinics, and community facilities.
3. Strengthen the R380 and Hendrik van Eck Road as the integration spine, with upgraded mobility infrastructure and safe public transport connections linking Sesheng and Mapoteng directly to Kathu.
4. Promote mixed-use community nodes within the integration zone that combine housing with retail, social facilities, and small business opportunities, creating more vibrant, inclusive neighbourhoods.
5. Enhance access to employment opportunities by improving connectivity from Mapoteng and Sesheng to the Kathu CBD, the R380 industrial complex, and the education and sports precinct.
6. Integrate land use planning and settlement design with broader spatial structuring elements to avoid peripheral dormitory-style development and instead create connected, liveable extensions of Kathu.

5.4.5 Olifantshoek CBD Precinct

5.4.5.1 Spatial Context

Olifantshoek functions as the southern service town of Gamagara, with a CBD that accommodates limited retail, municipal services, education and cultural facilities, and some hospitality functions. The N14 runs directly through the town, and the CBD has developed in a linear form along this corridor, shaping its spatial character. In addition to its service role, Olifantshoek also functions as a secondary industrial node within the municipality, accommodating light industry and service-related manufacturing.

Situated on both the Forgotten Highway and the Go-Ghaap! Heritage Route, the town is also well positioned to evolve into a heritage and tourism gateway, complementing its service and industrial functions with a stronger visitor economy.

5.4.5.2 Key Opportunities and Considerations

There is an opportunity to strengthen Olifantshoek's CBD as a secondary service and tourism node. Upgrading its public realm, enhancing tourism branding, and investing in retail facilities can reposition the town as a valued stop on the provincial tourism routes.

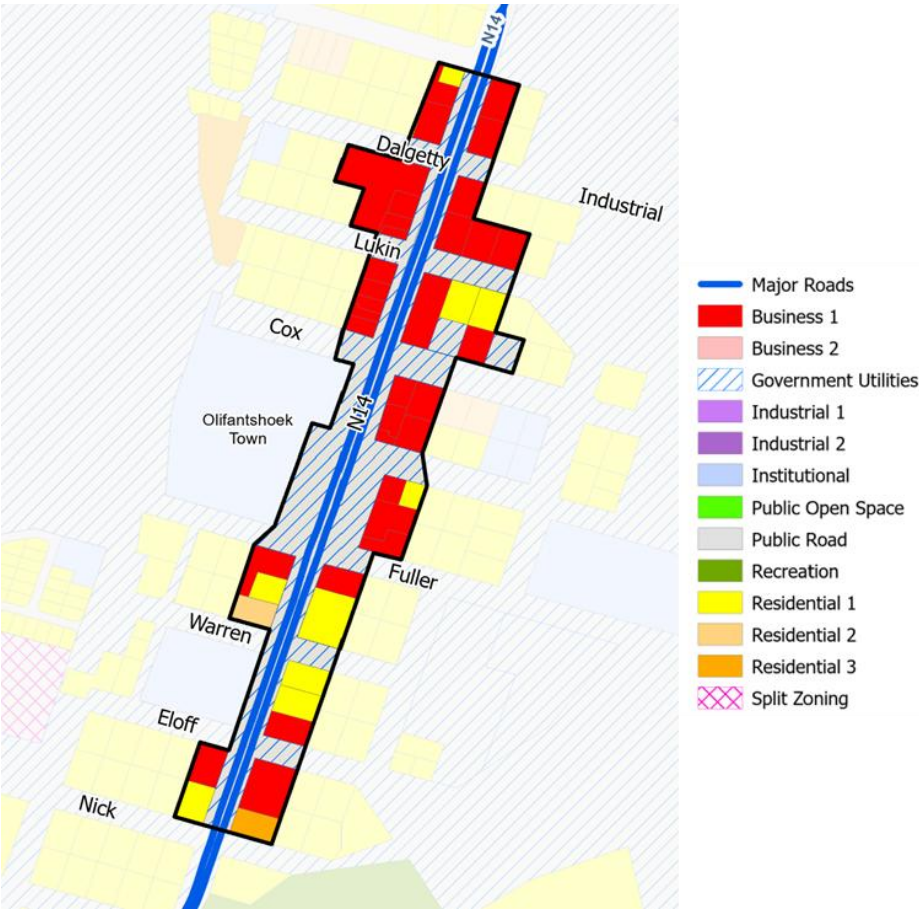
5.4.5.3 Spatial Guidance/Directives

The spatial guidance for Olifantshoek CBD is directed at consolidating its role as a secondary service and industrial node in Gamagara, while building on its location along two tourism corridors to develop a distinctive heritage and tourism gateway identity. The directives below provide the framework for upgrading local services, strengthening economic functions, and aligning zoning with this expanded role.

1. **Amend the boundaries of the Olifantshoek CBD, as set out in the 2022 MSDF**, to provide clearer definition, incorporate actual CBD-related functions, land uses, and developments not previously accommodated within the CBD, and more closely align with cadastral boundaries. This will ensure effective functioning of the land use scheme and the municipal property valuation roll.
2. Reinforce the Olifantshoek CBD as **Urban Development Zone 4** in the municipal spatial framework.
3. **Amend the land use scheme** to support this designation, enabling a mix of service, tourism, hospitality, light industrial, and community land uses.
4. **Consolidate Olifantshoek's role as a secondary industrial node** by accommodating light industry and service-related manufacturing in suitable areas on the CBD periphery, linked to the N14 corridor.
5. Upgrade **public spaces, streetscapes, signage, and tourism facilities** to create a more inviting and cohesive CBD environment.
6. Expand **hospitality and tourism-oriented enterprises**, such as guesthouses, restaurants, cultural centres, and craft markets, aligned with the Forgotten Highway and Go-Ghaap! Heritage Route.
7. Strengthen **municipal, education, and cultural service provision** to ensure the CBD functions as a community hub that supports surrounding settlements.

8. Develop a **tourism branding and wayfinding system** for Olifantshoek, reinforcing its identity as a heritage and tourism gateway.

FIGURE 6: OLIFANTSHOEK CBD PRECINCT



5.4.6 Dibeng CBD Precinct

5.4.6.1 Spatial Context

Dibeng functions as a smaller service hub, providing limited services and retail to meet daily community needs. As a result, many residents travel elsewhere to access a

broader range of goods and services. The constrained formal retail base has also led to the proliferation of informal spaza shops throughout the town, which play an important role in local livelihoods but operate outside formal planning and service frameworks.

The emphasis for Dibeng's spatial development is on the upgrading of informal settlements, the roll-out of infrastructure networks and service coverage, and the improvement and expansion of social amenities. Priorities include upgrading existing sports fields, constructing a new primary school, and ensuring that settlements are fully supported by bulk and internal services. In addition, a planned residential development within the CBD will provide middle- to higher-income flats, diversifying the housing stock and generating new demand for retail and services in the town centre.

5.4.6.2 Key Opportunities and Considerations

Dibeng has the opportunity to strengthen its role as a supporting service hub by consolidating and upgrading its retail and service functions. The limited formal retail base, alongside the widespread presence of informal spaza shops, points to the need for a more structured retail environment that supports small traders while expanding formal business opportunities.

A central focus is the upgrading of informal settlements, ensuring that communities benefit from reliable infrastructure, expanded service coverage, and improved living environments. At the same time, the upgrading and build-out of social amenities — including sports field improvements and the development of a new primary school — will significantly enhance quality of life and create a more balanced and resilient town. The planned middle- to higher-income residential development in the CBD presents a further opportunity to diversify the housing market, increase local footfall, and stimulate demand for retail, services, and hospitality. Together, these interventions can reposition Dibeng as a more functional, inclusive, and attractive node that complements Kathu and Olifantshoek while directly serving its own communities.

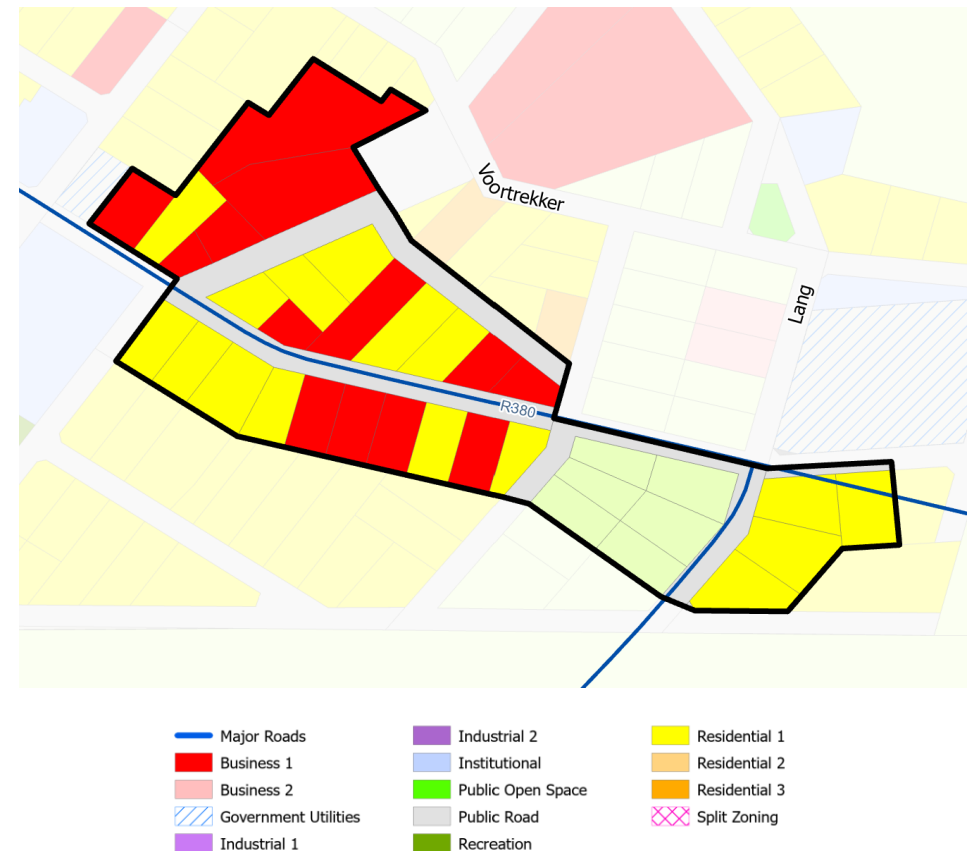
Dibeng has the potential to grow into a supporting node that complements Kathu and Olifantshoek, with a focus on community services, small-scale retail, agro-support, and linkages to nearby renewable energy projects.

5.4.6.3 Spatial Guidance/Directives

The spatial guidance for Dibeng CBD is aimed at strengthening its role as a supporting service hub, formalising its retail base, and ensuring that settlement upgrading, infrastructure expansion, and new social amenities are integrated into a coherent town centre. These directives also build on the catalytic potential of the planned residential development in the CBD to attract investment and expand Dibeng's role in the regional settlement network.

1. Amend the boundaries of the Dibeng CBD, as set out in the 2022 MSDF, to provide clearer definition, incorporate actual CBD-related functions, land uses, and developments not previously accommodated within the CBD, and more closely align with cadastral boundaries. This will support the effective functioning of the land use scheme and the municipal property valuation roll.
2. Reinforce the Dibeng CBD as Urban Development Zone 5 in the municipal spatial framework.
3. Amend the land use scheme to give effect to this designation, enabling a balanced mix of community services, retail, residential, and small enterprise opportunities.
4. Support the upgrading of informal settlements in and around Dibeng through phased provision of bulk and internal infrastructure, integrated with improved accessibility to the CBD.
5. Expand and upgrade social amenities, including the improvement of sports fields and the construction of a new primary school, ensuring that the CBD functions as a true community hub.
6. Encourage the formalisation and clustering of small traders and spaza shops within designated areas in the CBD, while supporting their integration into the broader retail offering.
7. Leverage the planned middle- to higher-income residential development in the CBD to stimulate local demand for retail, hospitality, and community services.
8. Enhance the public realm with landscaping, lighting, and signage to create a safer, more attractive, and accessible environment for residents and visitors.
9. Position Dibeng as a support hub for surrounding agricultural and renewable energy projects.

FIGURE 7: DIBENG CBD PRECINCT



5.4.7 Conclusion

Nodes, precincts, and sub-municipal functional zones provide the local anchors of Gamagara's spatial structure. By reinforcing the Kathu CBD as the municipality's primary service hub, activating gateway precincts along the N14 and R380, strengthening the Sesheng–Mapoteng integration zone, and upgrading the CBDs of Olifantshoek and Dibeng, the municipality is creating a network of well-defined development anchors that distribute opportunity more evenly across its territory.

Looking forward, these nodes and precincts are not simply service centres — they are the engines of spatial and social transformation, where compact growth,

reinvestment, and catalytic projects converge. Kathu will function as a regional economic hub within the corridor economy, capturing flows of logistics, trade, and investment, while at the same time serving as the civic centre at a municipal scale. It is important to note, however, that Kuruman, in the neighbouring Ga-Segonyana Municipality, is designated as the official regional service centre in the Northern Cape spatial structure. Olifantshoek will strengthen as a secondary service and industrial node and tourism gateway, while Dibeng will grow into a supporting service hub linked to surrounding agriculture and renewable energy. Together with integration efforts in Sesheng and Mapoteng, this system of nodes and precincts will ensure that Gamagara develops as a compact, connected, and opportunity-rich municipality, able to sustain livelihoods and drive diversification in a post-mining economy.

5.5 Urban Development Boundaries

5.5.1 Spatial Context

Urban Development Boundaries (UDBs) are a key spatial instrument for managing town growth. They discipline outward expansion by defining how far settlements may extend within a set timeframe, ensuring growth aligns with infrastructure capacity, protects sensitive land, and avoids costly sprawl.

For Gamagara, the management of urban expansion is particularly important. The municipality faces pressures from informal settlement growth, housing demand linked to PHSHDAs, and the attraction of new industrial and renewable energy investments. At the same time, its arid climate, finite water resources, and high cost of bulk infrastructure provision mean that unchecked expansion would undermine long-term sustainability.

The 2022 MSDF UDBs have been reviewed with consideration of municipal infrastructure coverage, environmentally sensitive land, the outcomes of the land use assessment, and population growth forecasts and land use budget prepared as part of the MSDF review. In alignment with provincial spatial guidance, a five-year UDB has been delineated for immediate growth management, together with a longer-term 15-year UDB that provides direction for future expansion.

5.5.2 Key Opportunities and Considerations

The introduction and enforcement of reviewed UDBs (see Map 1.1 – 1.3) in Gamagara provides an opportunity to:

1. **Promote compact, efficient settlements** that can be serviced at lower cost and with greater resilience.
2. **Phase housing and settlement growth** in line with Priority Human Settlement and Housing Development Areas (PHSHDAs), ensuring that projects in Kathu, Mapoteng, and other nodes are aligned with service capacity.
3. **Safeguard agricultural land, environmentally sensitive areas, and mineral assets** from encroachment by unmanaged settlement expansion.
4. **Provide predictability for investors and communities**, giving clarity about where development will be supported by the municipality.
5. **Improve financial sustainability**, as compact growth patterns reduce long-term operating costs for municipal infrastructure and services.

5.5.3 Spatial Guidance/Directives

The spatial guidance for UDBs in Gamagara emphasises phased, disciplined expansion that balances growth demands with service delivery capacity and environmental stewardship.

1. **Implement the reviewed five-year and 15-year UDBs** for Kathu, Olifantshoek, and Dibeng, ensuring they are embedded in the MSDF and aligned with provincial guidance.
2. **Review and update UDBs periodically** (at least every five years) to reflect progress in housing delivery, infrastructure upgrades, land use changes, and demographic trends.
3. **Incorporate UDBs into the municipal land use scheme**, so that development applications outside the boundaries can be managed appropriately.
4. **Integrate UDBs with Local Area Plans** for growth corridors and nodes, ensuring that expansion areas are planned holistically and not in isolation.
5. **Link UDB phasing to infrastructure planning**, so that bulk service upgrades and extensions are synchronised with approved growth phases.

6. **Use UDBs to guide the upgrading of informal settlements**, prioritising in-situ upgrading where possible within the defined urban edge, and ensuring that new extensions are serviceable.

5.6 Conclusion

The Spatial Structuring Development Framework defines the organising logic of Gamagara's spatial form, bringing together regions and zones, corridors, nodes and precincts, and urban development boundaries into one coherent structure. At the broadest scale, functional regions and zones position the municipality within the North-Western Transformation Region and the Gamagara Spatial Action Area, highlighting its dual role as both a mining and renewable energy hub. At the next level, development corridors provide the spines of the spatial economy, enabling Gamagara to capture flows of logistics, trade, energy, and tourism while reinforcing settlement integration and gateway functions. Anchored within this system, nodes, precincts, and sub-municipal functional zones serve as the local anchors of growth, distributing opportunities more evenly and supporting compact, inclusive development. Finally, urban development boundaries (UDBs) discipline outward expansion, ensuring that growth is phased, serviceable, environmentally sustainable, and financially viable.

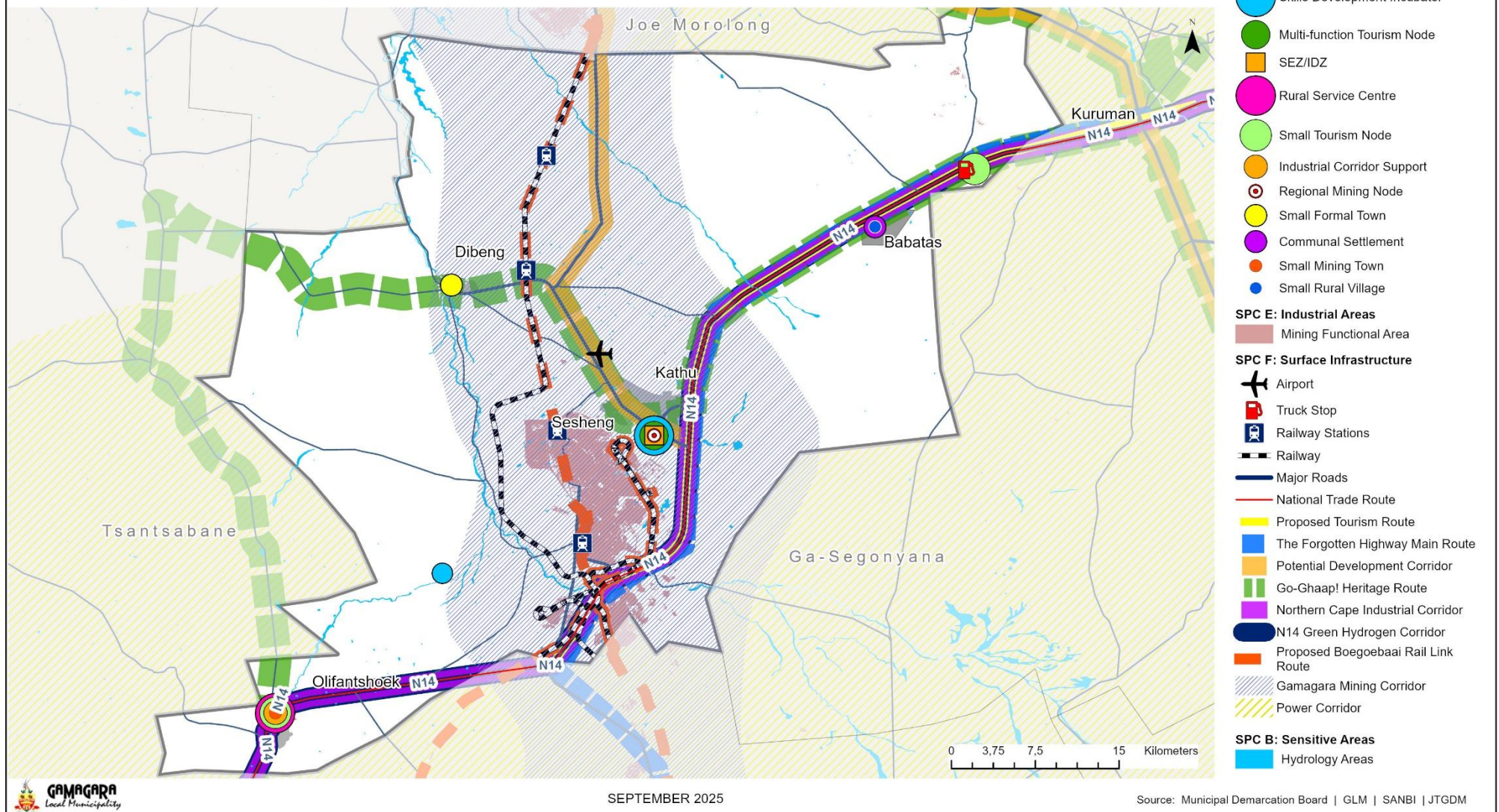
The structuring elements are spatially consolidated in **Map 1: Composite Municipal-Level Spatial Structuring Framework Development Plan**, which illustrates the municipality's settlement hierarchy and the relationship between nodes and corridors. At the top of the hierarchy, Kathu functions as the regional economic hub within the corridor economy, capturing flows of logistics, trade, and investment, while serving as the civic centre at municipal scale. Olifantshoek is identified as a secondary service and industrial node and tourism gateway, strengthening its role along the N14 and tourism routes. Dibeng functions as a supporting service hub, with important linkages to surrounding agricultural and renewable energy developments. The Sesheng–Mapoteng integration zone emerges as a growth corridor that bridges housing delivery, social services, and access to employment opportunities.

Complementing these structuring elements, the Urban Development Boundaries (UDBs) provide the growth management framework for Kathu, Olifantshoek, and Dibeng, aligning settlement expansion with infrastructure coverage, environmental considerations, and long-term land use planning. A five-year UDB has been established to guide immediate growth management, along with a 15-year UDB that sets the horizon for longer-term expansion. These boundaries are depicted in detail in **Maps 1.1 to 1.3**.

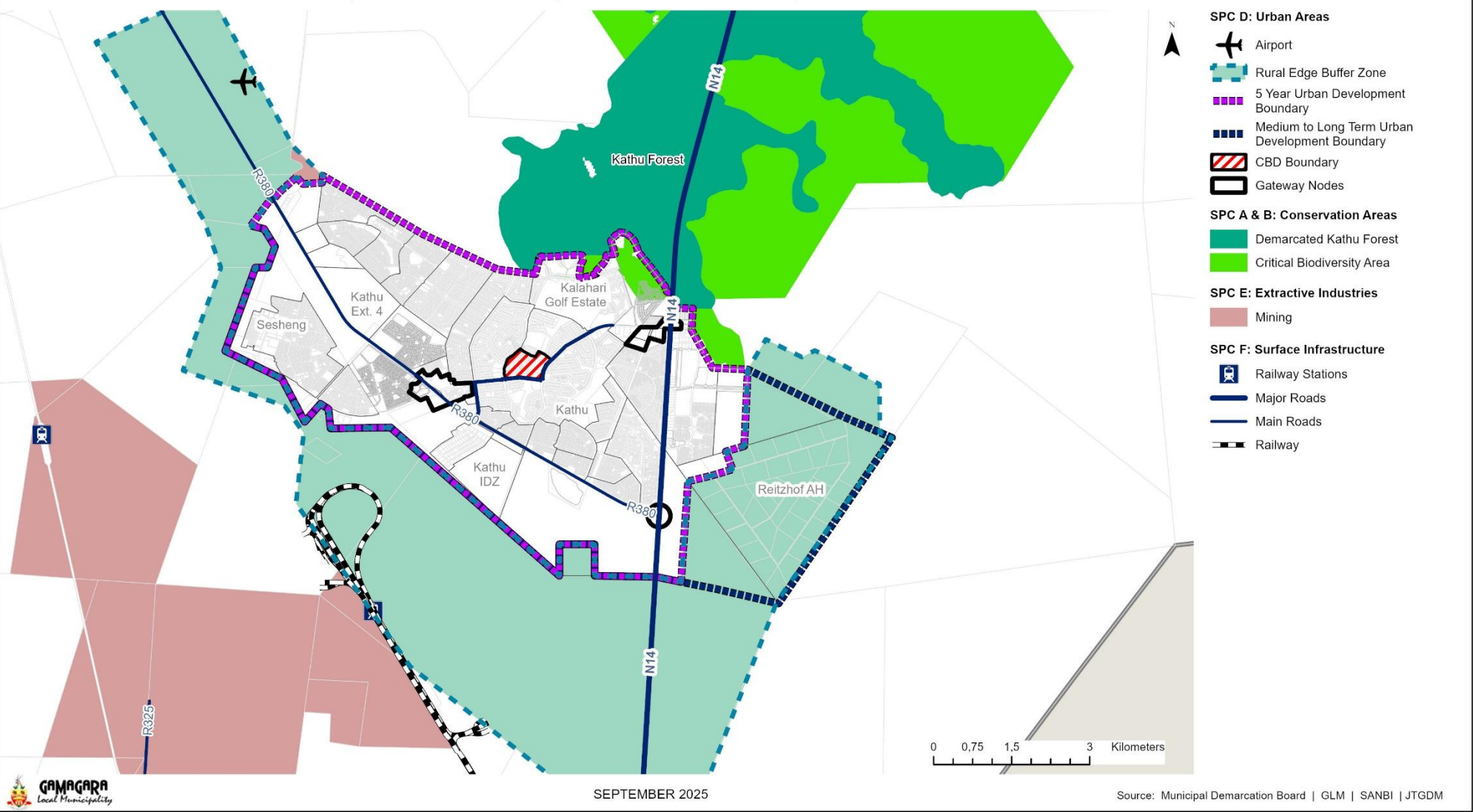
Together, the spatial structuring elements, nodes, and UDBs provide a coherent, multi-layered framework that balances regional integration with local transformation. They channel investment into strategic areas, protect sensitive environments, strengthen settlement integration, and prepare Gamagara for a diversified, post-mining economy. In doing so, the framework positions the municipality not only as a regional economic hub within the corridor economy, but also as a compact, connected, and opportunity-rich municipality, ready to sustain livelihoods and attract investment into the future.

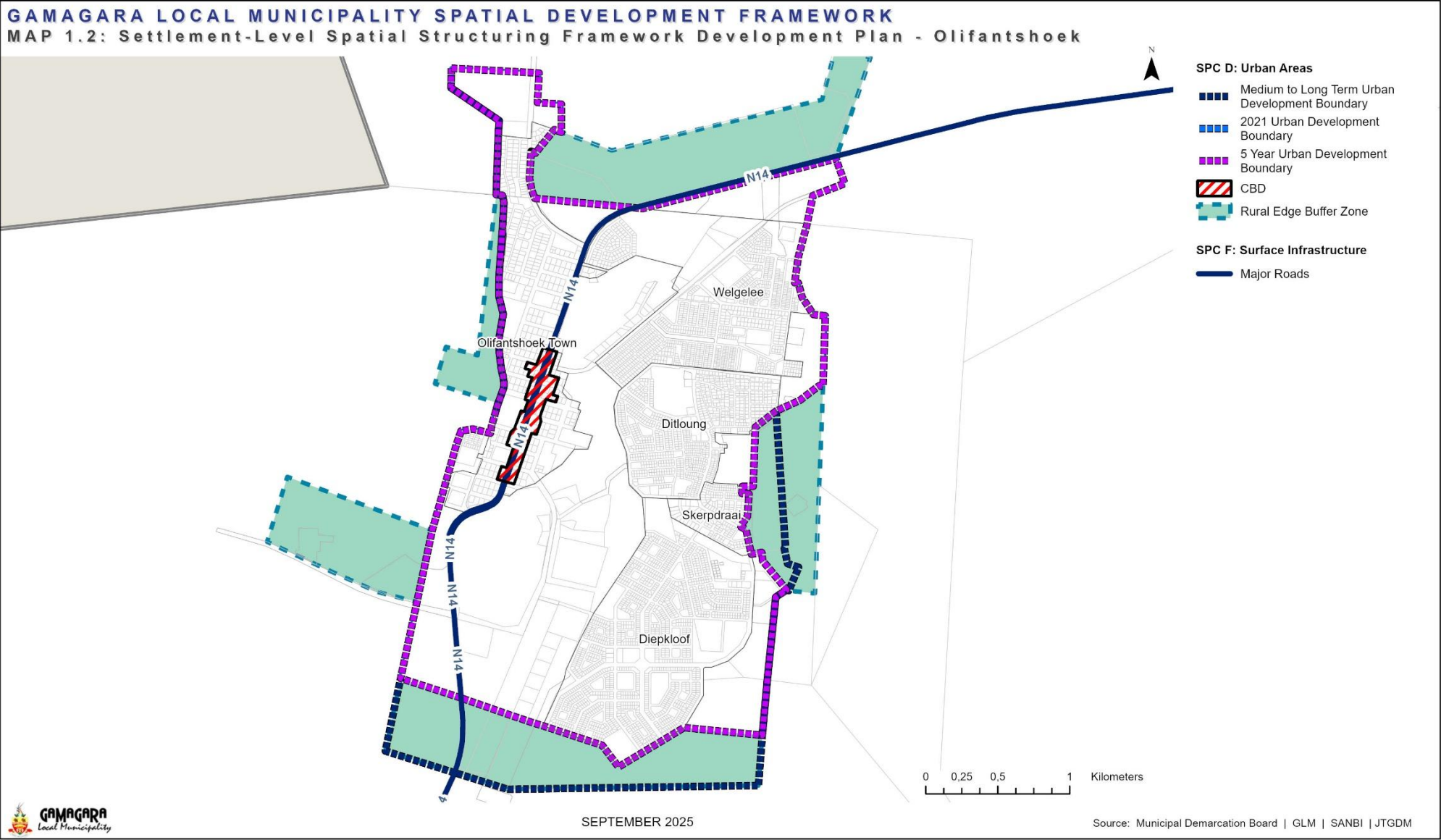
GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

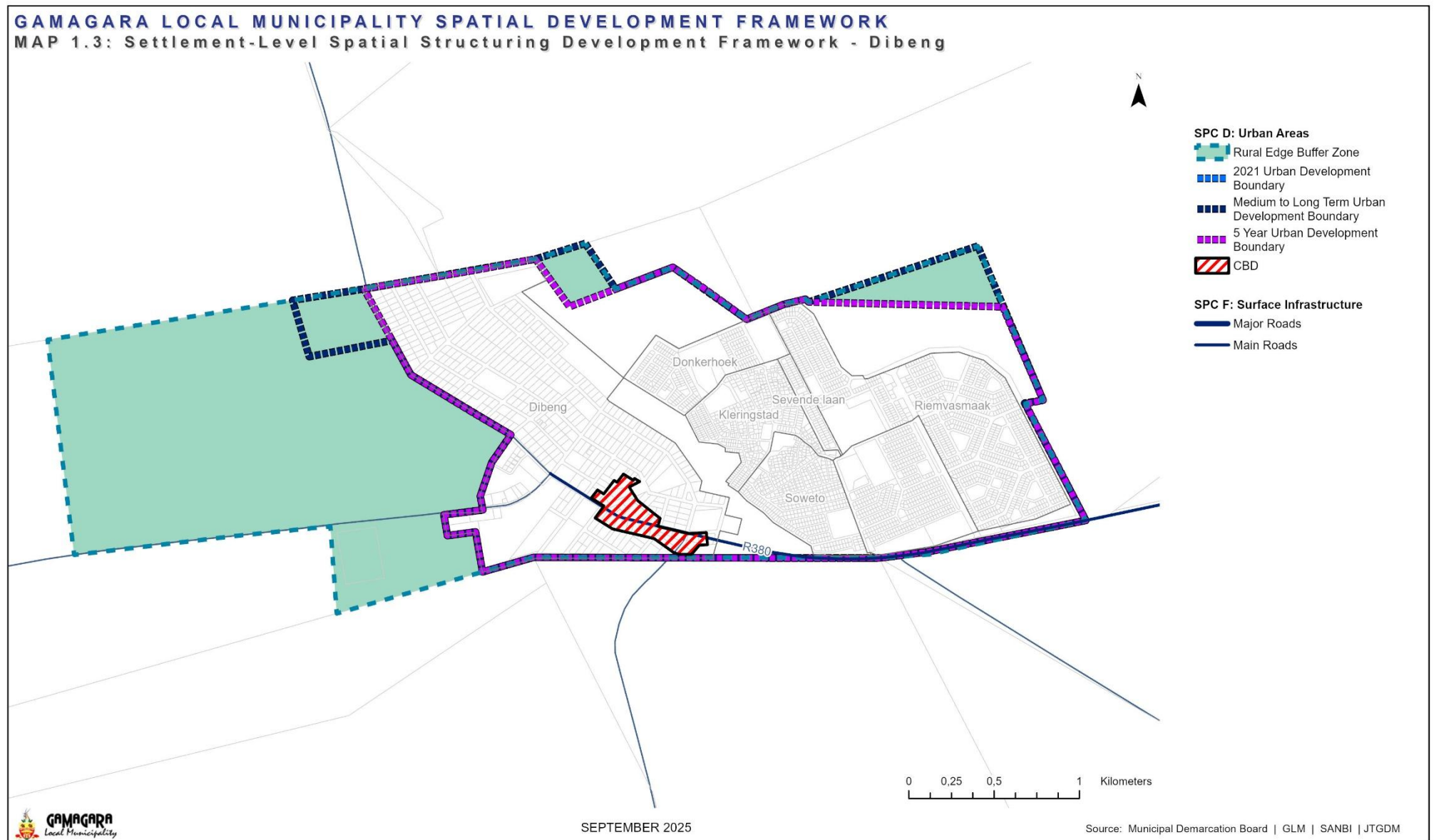
MAP 1: Spatial Structuring Framework Development Plan



GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK
MAP 1.1: Settlement-Level Spatial Structuring Framework Development Plan - Kathu







6. Biophysical Framework Development Plan

6.1 Introduction

Gamagara is characterised by a combination of unique ecological assets, geological hazards, and climate pressures. The Kathu Camel Thorn Protected Forest is a nationally significant ecological and cultural landmark, anchoring the identity of the municipality as a green oasis in the arid Kalahari. The municipality also contains extensive Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which provide ecosystem services such as water regulation, soil stabilisation, and carbon storage. Hydrological systems are fragile, and groundwater resources are under stress from mining, agriculture, and settlement growth. Soils and vegetation are variable, with only limited areas suitable for intensive agriculture, while large portions are constrained by aridity, erosion, and degradation.

Geological conditions add further complexity. Approximately 12% of Gamagara is underlain by dolomitic land, which is highly susceptible to sinkhole and subsidence formation. This requires specialised investigation, hazard mapping, and engineering controls to ensure safe settlement development. Climate change further amplifies these risks, with rising temperatures, reduced rainfall, and increased fire events projected for the region.

6.2 Spatial Context

Gamagara contains distinctive and sensitive environmental and geological features. The Kathu Camel Thorn Protected Forest stands as a unique ecological asset and cultural landmark. The municipality is further characterised by extensive Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which provide vital ecosystem services such as water regulation, soil stability, and carbon sequestration. Hydrological systems are fragile, with groundwater resources already under pressure from mining, agriculture, and settlements. Soils and vegetation are variable, with only limited areas suitable for intensive agriculture, while much of the landscape is constrained by aridity, erosion, and degradation.

In addition, around 12% of Gamagara is underlain by dolomite land. Dolomite is highly susceptible to sinkhole and subsidence formation, posing risks to settlements, infrastructure, and human safety. The presence of dolomitic land requires specialised investigation, land-use controls, and engineering design to ensure safe development.

At the same time, large mining footprints dominate the landscape, presenting both risks of long-term degradation and opportunities for repurposing and ecological restoration.

6.3 Key Opportunities and Considerations

A key opportunity lies in the transformation of mining land as part of Gamagara's post-mining transition. Decommissioned pits, tailings, and industrial sites can be rehabilitated and converted into renewable energy facilities, biodiversity reserves, agricultural assets, and community amenities. Projects such as the Iron Orchard exemplify how degraded mining land can be restored into productive ecological and agricultural landscapes.

The municipality is also a high-potential renewable energy landscape. With some of South Africa's highest solar irradiance and access to national transmission infrastructure, Gamagara is well-placed for solar projects. However, these projects must be carefully sited to avoid CBAs and sensitive ecological zones.

Another critical consideration is invasive species management, particularly *Prosopis*. While initially introduced for shade and fodder, *Prosopis* has become one of the most damaging invasive species, lowering groundwater levels, reducing grazing capacity, and accelerating soil erosion. *Prosopis* can be harvested and processed into livestock fodder and biochar, generating jobs and creating a circular economy while restoring ecological function.

The safe development of dolomitic land is another critical consideration. Dolomite is prone to sinkhole formation, with potentially devastating impacts on property, infrastructure, and human safety. SPLUMA and SANS 1936 standards require the municipality to adopt a Dolomite Risk Management Strategy (DRMS), enforce hazard zonation, and apply geotechnical and engineering controls to reduce risks.

Finally, climate change introduces cross-cutting risks and imperatives. The municipality must prioritise ecosystem-based adaptation, water conservation, and climate-smart settlement design. Measures such as reforestation, wetland rehabilitation, and green infrastructure not only protect ecosystems but also improve the liveability and resilience of human settlements.

6.4 Settlement-Level Biophysical Framework Plans

6.4.1 Kathu

Kathu, recognised as a green oasis in the arid Kalahari, must reinforce this identity through the strategic extension of tree cover and the establishment of new tree lines along its main corridors and entrances. All trees planted must be locally appropriate — water-wise, climate-resilient, and suited to local soil types — while providing shade. Extending tree coverage has multiple interlinked objectives: reducing heat stress, filtering noise and air pollution, sequestering carbon, enhancing the attractiveness and liveability of the town, supporting tourism, and aiding orientation and wayfinding along corridors and main routes.

A key intervention is the remediation and activation of the north–south green corridor running through the CBD. At present, this critical green corridor is degraded: informal dwellers light fires at night, there is widespread drug and alcohol use, and extensive littering has become commonplace. As a result, school children and the general public increasingly avoid this space. The need for transformation is therefore urgent — to protect and restore the natural green space, while also making it safe, functional, and enjoyable for people. These two objectives are inseparable and mutually reinforcing. The corridor should be enhanced through low-impact, environmentally sensitive interventions that preserve its ecological value while improving accessibility and safety. This includes permeable pedestrian and cycling pathways, shaded seating areas, solar-powered eco-sensitive lighting, interpretive signage, stormwater-sensitive landscaping such as bioswales (see Technical Note), and small-scale community gathering points. Where degradation has occurred, ecological rehabilitation must be undertaken using indigenous, water-wise vegetation. Above all, all existing trees in the corridor must be preserved and protected, with new interventions designed to complement and strengthen the green character of the space.

Through these measures, the Kathu green corridor can be transformed into a multifunctional open space system that integrates ecological functioning, recreation, safety, and community identity. It will once again serve as a vital spine of the town’s green infrastructure, connecting people with nature, strengthening Kathu’s character as a green oasis, and supporting both ecological resilience and human well-being.

Kathu’s transformation must also be supported through community collaboration. Partnerships with existing community initiatives should be strengthened to improve

and protect public space, educate youth on environmental stewardship, and host public clean-ups, tree planting, and beautification activities linked to events such as Arbor Day. Local businesses should be engaged as partners and sponsors for tree planting and maintenance programmes. In this way, the community becomes an active custodian of the town’s natural environment, reinforcing both ecological protection and civic pride.

Technical Note: Bioswales in Arid Environments

What are bioswales?

Bioswales are shallow, vegetated, and gently sloped channels designed to capture, slow, and filter stormwater runoff. They reduce erosion, improve water quality, and promote infiltration into the ground.

Why they matter for Gamagara:

- ▶ Gamagara experiences intense but infrequent rainfall events that often result in flash flooding.
- ▶ Bioswales can reduce flood risk by slowing down stormwater and directing it into the soil rather than directly into storm drains.
- ▶ When planted with indigenous, drought-resistant vegetation, bioswales provide additional ecological and aesthetic benefits.

Special considerations in arid areas:

- ▶ Soil type: Bioswales should be designed to slow and filter stormwater, rather than maximise infiltration alone.
- ▶ Vegetation: Use locally appropriate, water-wise species that can withstand both drought and occasional high flows.
- ▶ Integration: Bioswales should be integrated into hybrid stormwater systems, complementing conventional engineered drainage.

Key benefits:

- ▶ Mitigates flash flooding and erosion.
- ▶ Improves water quality by filtering pollutants.
- ▶ Enhances settlement greening with low-maintenance vegetation.
- ▶ Supports climate-resilient and water-sensitive urban design

6.4.2 Olifantshoek

Olifantshoek faces critical constraints where parts of the proclaimed township extend into floodlines. In these zones, no further development can be permitted in order to protect ecological functioning, manage flood risk, and safeguard human safety. Development restrictions must be enforced through the municipality's land use management system.

Within its safe development envelope, Olifantshoek should focus on greening and public space rehabilitation. Establishing tree lines along main corridors, entrances, and public areas will provide shade, reduce heat stress, and contribute to a more attractive settlement. As in Kathu, trees planted must be indigenous, water-wise, and climate-resilient. Public spaces should be upgraded to integrate stormwater management ponds where appropriate, serving as both flood management systems and attractive recreational features.

Community-driven initiatives are central to sustaining these interventions. Schools, NGOs, and local groups should be engaged in public space clean-ups, tree planting, and awareness programmes, while businesses should be encouraged to contribute resources and sponsorships. Through such collaboration, Olifantshoek can create a network of green and multifunctional public spaces that strengthen both ecological resilience and community identity.

6.4.3 Dibeng

Dibeng similarly contains proclaimed township areas within floodlines, where further development must be strictly prohibited. These restrictions are critical to reduce disaster risk and to maintain ecological stability.

Like Kathu and Olifantshoek, Dibeng should pursue settlement greening through tree planting and open space rehabilitation. Priority should be given to corridors and public gathering areas, creating shaded, liveable, and attractive urban environments. Rehabilitation of degraded areas, particularly those adjacent to watercourses, should stabilise soils, support biodiversity, and provide multifunctional recreational spaces. The integration of stormwater management ponds into public space design, where appropriate, will further reduce flood risk while adding amenity value to the townscape.

Community participation is essential for Dibeng's environmental renewal. Collective clean-up campaigns, tree planting drives, and youth education programmes should

be embedded in local practice, supported by municipal facilitation and business sponsorships. These efforts will not only strengthen Dibeng's resilience but also foster a culture of pride and responsibility for the natural environment.

6.4.4 Integrated Settlement Perspective

Across all three towns, the settlement-level biophysical framework emphasises a common set of principles:

1. Protecting ecological and hazard-prone areas, such as floodlines and green corridors.
2. Extending tree cover and tree lines with indigenous, water-wise species to achieve climate resilience, urban attractiveness, and ecological services.
3. Transforming and rehabilitating public spaces using low-impact, environmentally sensitive interventions.
4. Integrating stormwater management ponds and bioswales into park and corridor design to deliver multifunctional ecological and social benefits.
5. Strengthening community collaboration, through partnerships with schools, NGOs, and businesses, to anchor stewardship, education, and ongoing maintenance.

Together, these measures will ensure that Kathu, Olifantshoek, and Dibeng evolve as greener, safer, and more resilient settlements. They demonstrate how ecological protection and community well-being are interlinked, positioning Gamagara as a municipality that actively integrates environmental stewardship into its spatial and settlement planning.

6.5 Spatial Guidance and Directives

The biophysical framework provides the foundation for safeguarding ecological assets, mitigating geological and climate risks, and enabling sustainable development. A key objective is for the municipality not only to implement climate-resilient measures, but also to increase the stock and quality of ecological assets through mining land remediation, invasive species management, and the activation of public spaces into multifunctional green infrastructure. In this way, natural systems are both protected and expanded, creating greener, safer, and more liveable towns. To achieve this, the following directives must guide spatial planning and land use:

1. **Protect Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs):** Prohibit non-compatible or harmful land uses; preserve and buffer the Kathu Camel Thorn Protected Forest (**see Table 3**).
2. **Promote the establishment of game farms in sensitive areas:** Support conservation of biomes while bolstering tourism and economic diversification.
3. **Plan and adapt to climate change:** Implement comprehensive responses in the built environment, including spatial planning, urban design, land use management, engineering, and infrastructure asset management.
4. **Enhance the urban natural environment:**
 - a. Develop an integrated open space management system linking parks and public open spaces.
 - b. Upgrade parks into multi-functional spaces that provide recreation, relaxation, environmental protection, education, and local economic opportunities.
 - c. Expand tree cover in all towns, using water-wise, climate-resilient species suited to local soils, to extend Kathu's character as a "green oasis in the arid Kalahari" and reduce sun exposure and heat stress.
5. **Improve environmental performance of infrastructure systems:**
 - a. Ensure landfill sites comply with NEMA requirements and licensing.
 - b. Refurbish and optimise water treatment works (WTW) and wastewater treatment works (WWTW) using green efficiency technologies, ensuring compliance to protect water resources, avoid untreated discharges, and reduce the need for costly new facilities.
 - c. Apply sound water conservation and demand management practices, including leak detection and pipe replacement.
6. **Review municipal by-laws:** Strengthen requirements for energy and water efficiency, including mandatory rainwater harvesting and greywater re-use where appropriate.
7. **Promote circular economy principles:**
 - a. Require circular economy measures in high-impact land uses such as mining and industry.
 - b. Prioritise development of waste reclamation and recycling infrastructure, operations, and local opportunities for a waste economy.
8. **Advance environmental remediation:**
 - a. Engage with provincial, district, and mining stakeholders on mine closure and remediation planning.
 - b. Promote rehabilitation of the "Asbestos No-Go Area."
9. **Repurpose post-mining land and infrastructure:** Convert end-of-life mining land into renewable energy facilities, biodiversity reserves, education facilities, agricultural assets, and community amenities.
10. **Address invasive species, especially Prosopis:** Integrate harvesting and processing into circular economy models (fodder, biochar), while restoring grazing land and groundwater levels.
11. **Manage dolomitic land safely:** Implement a Dolomite Risk Management Strategy (DRMS), hazard zonation, and SANS 1936 compliance; restrict unsafe development.
12. **Integrate water-sensitive urban design:** Apply bioswales and, where appropriate, stormwater management ponds in parks and public spaces, combining flood management with amenity and biodiversity benefits.
13. **Settlement-level directives:**
 - a. *Kathu:* Extend tree cover and add tree lines; remediate and activate the degraded north–south green corridor through low-impact, environmentally sensitive interventions.
 - b. *Olifantshoek & Dibeng:* Enforce strict floodline restrictions where townships overlap with flood-prone areas; instead prioritise greening, open space rehabilitation, and climate-resilient tree planting.
 - c. Strengthen community collaboration: Partner with schools, NGOs, faith groups, and businesses to anchor environmental stewardship, clean-up campaigns, Arbor Day tree planting events, and sponsorships for greening initiatives.

6.6 Conclusion

By safeguarding Critical Biodiversity Areas, managing dolomitic land responsibly, and enforcing floodline restrictions, the municipality ensures that vulnerable systems and communities are protected. At the same time, new opportunities are unlocked by transforming degraded land into renewable energy hubs, biodiversity reserves, agricultural projects, and vibrant community spaces. Settlement-level greening through tree cover, tree lines, and corridor rehabilitation reinforces this approach, creating greener and more attractive towns that support both ecological integrity and social well-being.

The framework also underscores the importance of climate resilience. Through water-sensitive urban design measures such as bioswales and stormwater management

ponds, alongside upgrades to municipal infrastructure, the municipality can adapt to a hotter, drier climate while improving the performance of its service systems.

Finally, the plan highlights that environmental stewardship cannot be achieved by government alone. Community collaboration — through schools, NGOs, civic initiatives, and business sponsorships — is central to creating a culture of care for public spaces and natural systems. These partnerships build civic pride and ensure that ecological gains are sustained over the long term.

Through these combined measures, Gamagara positions itself as a municipality that actively integrates environmental restoration with spatial planning. The biophysical framework thus provides the foundation for a more resilient, liveable, and future-fit municipality, where ecological assets are both protected and expanded to support sustainable development in the post-mining era.

TABLE 3: LAND USE GUIDELINES FOR PROTECTED AND SENSITIVE AREAS

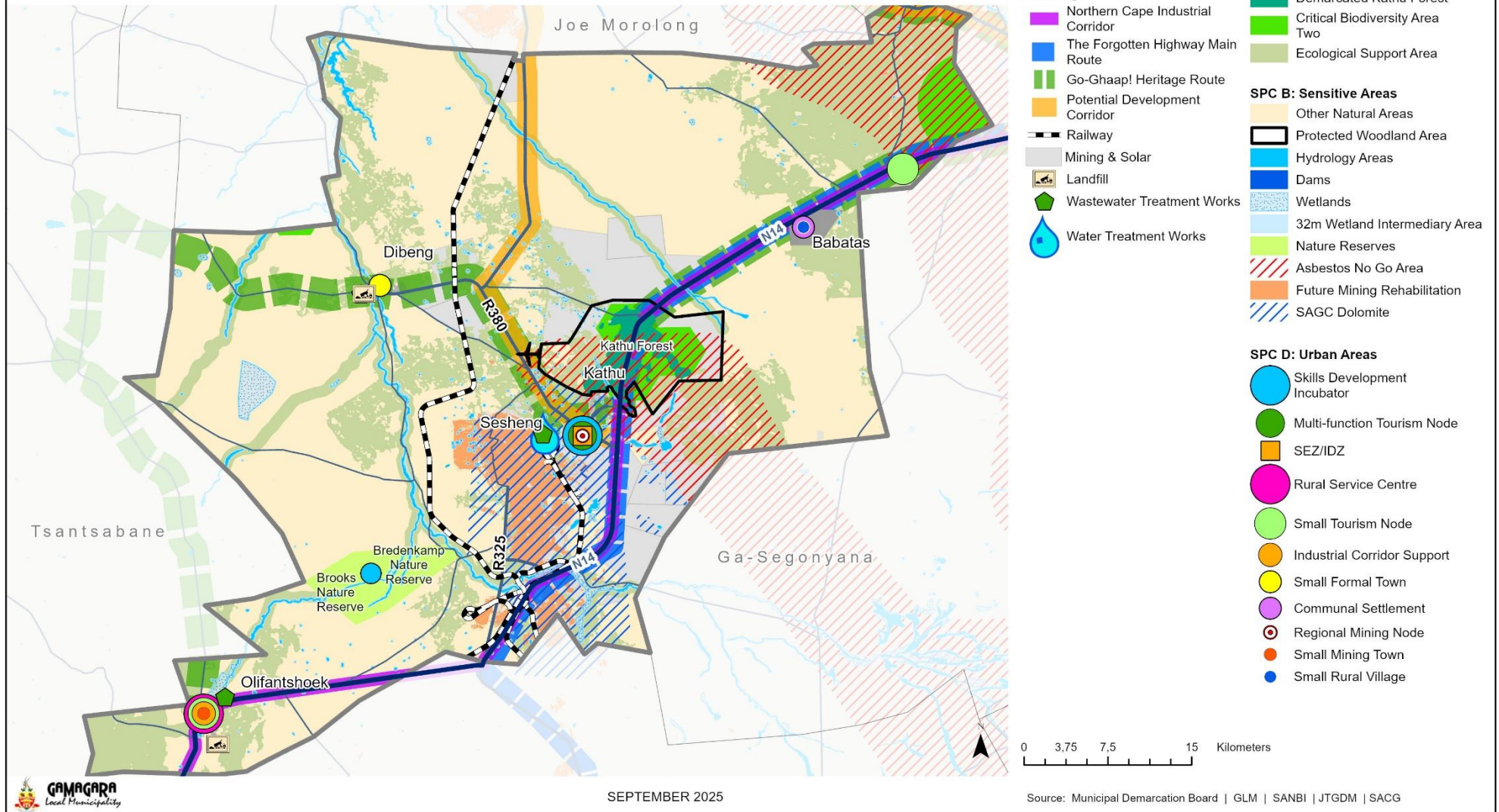
CBA Map Category	Description	Land Management Objective	Land Management Recommendations	Compatible Land-Use	Incompatible Land-Use
Critical Biodiversity Areas (1)	Irreplaceable Sites. Areas required to meet biodiversity pattern and/or ecological processes targets. No alternative sites are available to meet targets.	Maintain in a natural state with limited or no biodiversity loss. Rehabilitate degraded areas to a natural or near natural state and manage for no further degradation.	Obtain formal conservation protection where possible. Implement appropriate zoning to avoid net loss of intact habitat or intensification of land use.	Conservation and associated activities. Extensive game farming and eco-tourism operations with strict control on environmental impacts and carrying capacities, where the overall there is a net biodiversity gain. Extensive Livestock Production with strict control on environmental impacts and carrying capacities. Required support infrastructure for the above activities. Urban Open Space Systems.	Urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; Infrastructure (roads, power lines, pipelines). Intensive Animal Production (all types including dairy farming associated with confinement, imported foodstuffs, and improved/irrigated pastures). Arable Agriculture (forestry, dry land & irrigated cropping). Small holdings.
Critical Biodiversity Area (2)	Best Design Selected Sites. Areas selected to meet biodiversity pattern and/or ecological process targets. Alternative sites may be available to meet targets.	Maintain in a natural state with limited or no biodiversity loss. Maintain current agricultural activities. Ensure that land use is not intensified and that activities are managed to minimize impact on threatened species.	Avoid conversion of agricultural land to more intensive land uses, which may have a negative impact on threatened species or ecological processes.	Current agricultural practices including arable agriculture, intensive and extensive animal production, as well as game and ecotourism operations, so long as these are managed in a way to ensure populations of threatened species are maintained and the ecological processes which support them are not impacted. Any activities compatible with CBA1.	Urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining & Industrial; Infrastructure (roads, power lines, pipelines). More intensive agricultural production than currently undertaken on site. Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designated to CBA2. Alternative areas may need to be identified to ensure the CBA network still meets the required targets.
Ecological Support Areas	Areas with no natural habitat are important for supporting ecological processes.	Avoid additional / new impacts on ecological processes.	Maintain current land-use. Avoid intensification of land use, which may result in additional impact on ecological processes.	Existing activities (e.g., arable agriculture) should be maintained, but where possible a transition to less intensive land uses or ecological restoration should be favored.	Any land use or activity that results in additional impacts on ecological functioning mostly associated with the intensification of land use in these areas (e.g., Change of floodplain from arable agriculture to an urban use or from recreational fields and parks to urban).
Other Natural Areas	Natural and intact but not required to meet targets, or identified as CBA or ESA	No management objectives, land management recommendations or land-use guidelines are prescribed. These areas are nevertheless subject to all applicable town and regional planning guidelines and policy. Where possible, existing Not Natural areas should be favoured for development before "Other natural areas" as before "Other natural areas" may later be required either due to the identification of previously unknown important biodiversity features on these sites or where the loss of CBA has resulted in the need to identify alternative sites.			

Nr	Land use zone	Associated land use activities	PA/CA	CBA1	CBA2	ESA1	ESA2	ONA
1	Environmental conservation	Conservation management, low-intensity eco-tourism activities and sustainable consumptive activities.	Y	Y	Y	Y	Y	Y
2	Environmental management overlay zone	These areas are designated priority areas for protection, namely CBAs and ESAs, and can include ONAs.	N/A	Y	Y	Y	Y	N/A
3	Tourism and accommodation	Low-impact tourism / recreational and accommodation.	R	R	R	Y	Y	Y
		High-impact tourism / residential and accommodation (e.g. golf estates).	N	N	N	N	R	Y
4	Rural residential	Low-density rural housing or eco-estates.	N	R	R	R	R	Y
		Traditional areas (existing) and rural communal settlements ((new).	N	N	N	R	R	Y
5	Agriculture	Extensive game farming	R	Y	Y	Y	Y	Y
		Extensive livestock production	R	Y	Y	Y	Y	Y
		Game breeding	N	N	N	N	N	Y
		Arable land – dryland and irrigated crop cultivation	N	N	N	R	Y	Y
		Agricultural infrastructure – intensive animal farming (e.g. feedlot, dairy, piggery, chicken battery)	N	N	N	N	R	Y
6	Municipal commonage	Local agri-economic development	N	N	R	R	Y	Y
7	Open space	Public or private open space, including recreational areas, parks, etc.	R	R	R	R	Y	Y
8	Residential	Low, low-medium, medium-high, and high-density urban residential (urban & business development)	N	N	N	N	N	R
9	Urban influence	An amalgamation of land use zones, including Institutional, Urban Influence, General Mixed Use, Low Impact Mixed Use, Suburban Mixed Use and General Business (Urban & Business Development).	N	N	N	N	N	R

Nr	Land use zone	Associated land use activities	PA/CA	CBA1	CBA2	ESA1	ESA2	ONA
10/11	Low or high impact and general industry	Low, general, and high-impact industries (Urban & Business Development).	N	N	N	N	N	R
12	Transport services	Transportation service land uses, e.g. airports, railway stations, Petro-ports and truck stops, bus and taxi ranks, and other transport depots.	N	R	R	R	R	R
13	Roads and railways	Existing and planned linear infrastructure, such as hardened roads and railways, including activities and buildings associated with road construction and maintenance, e.g. toll booths, construction camps, and road depot sites (Linear Engineering Structures).	N	R	R	R	R	R
14	Utilities	Linear engineering structures, such as pipelines, canals, and power lines.	N	R	R	R	R	R
		Small-scale infrastructure installations, including wastewater treatment works and energy substations.	N	N	R	R	R	R
		Large-scale infrastructure installations, including bulk water transfer schemes, impoundments ((Water Projects & Transfers), and energy generation facilities (power stations).	N	N	N	N	N	R
		Renewable energy (PV farms and solar arrays).	N	N	N	N	N	R
		Renewable energy (wind farms).	N	N	R	R	R	R
15	Quarrying and mining	Prospecting and underground mining.	N	N	R	R	R	R
		Quarrying and open-cast mining (includes surface mining, dumping, and dredging).	N	N	N	N	N	R
		Hydraulic fracturing (fracking)	N	N	N	R	R	R

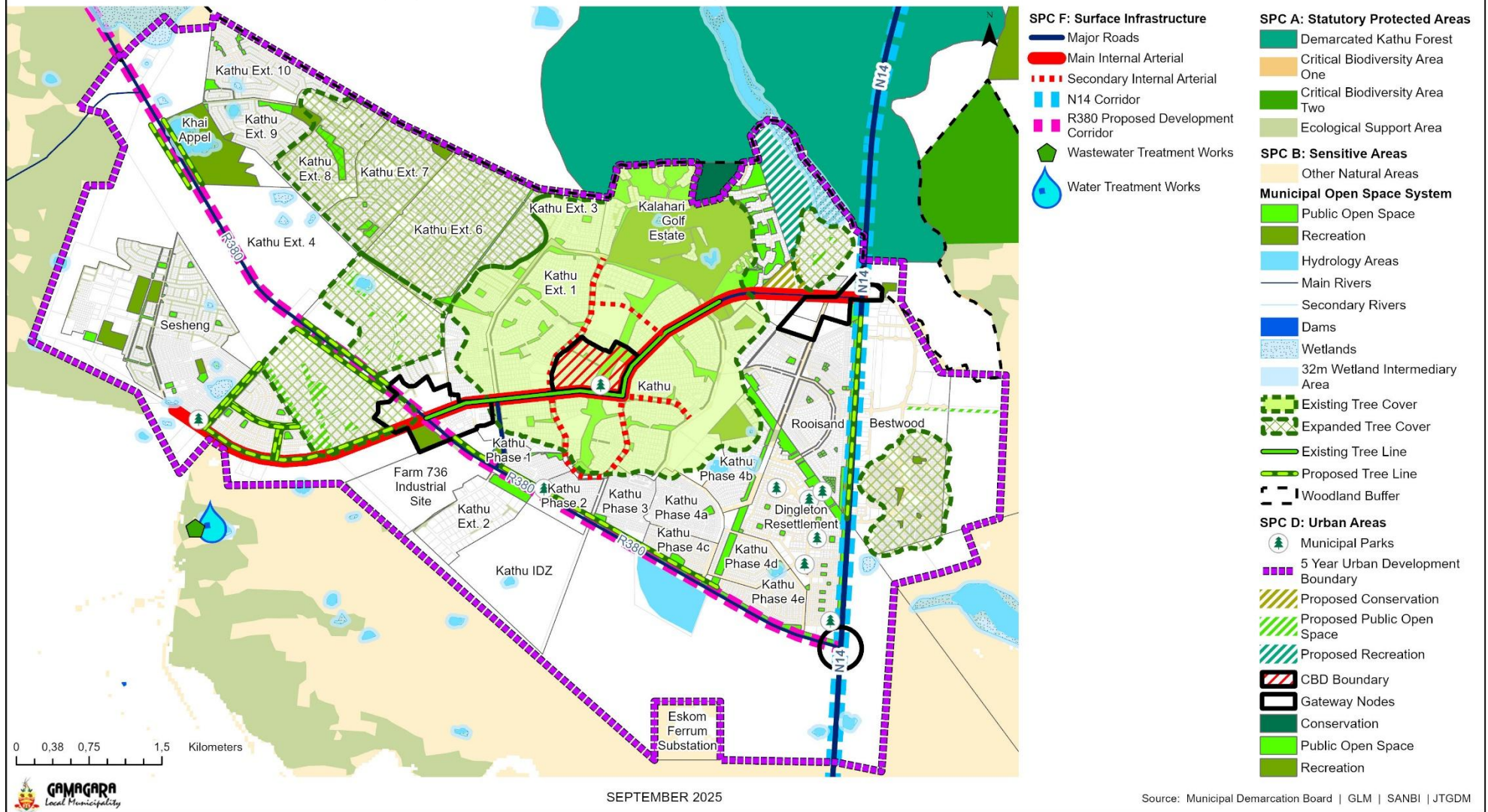
GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

MAP 2: Biophysical Framework Development Plan



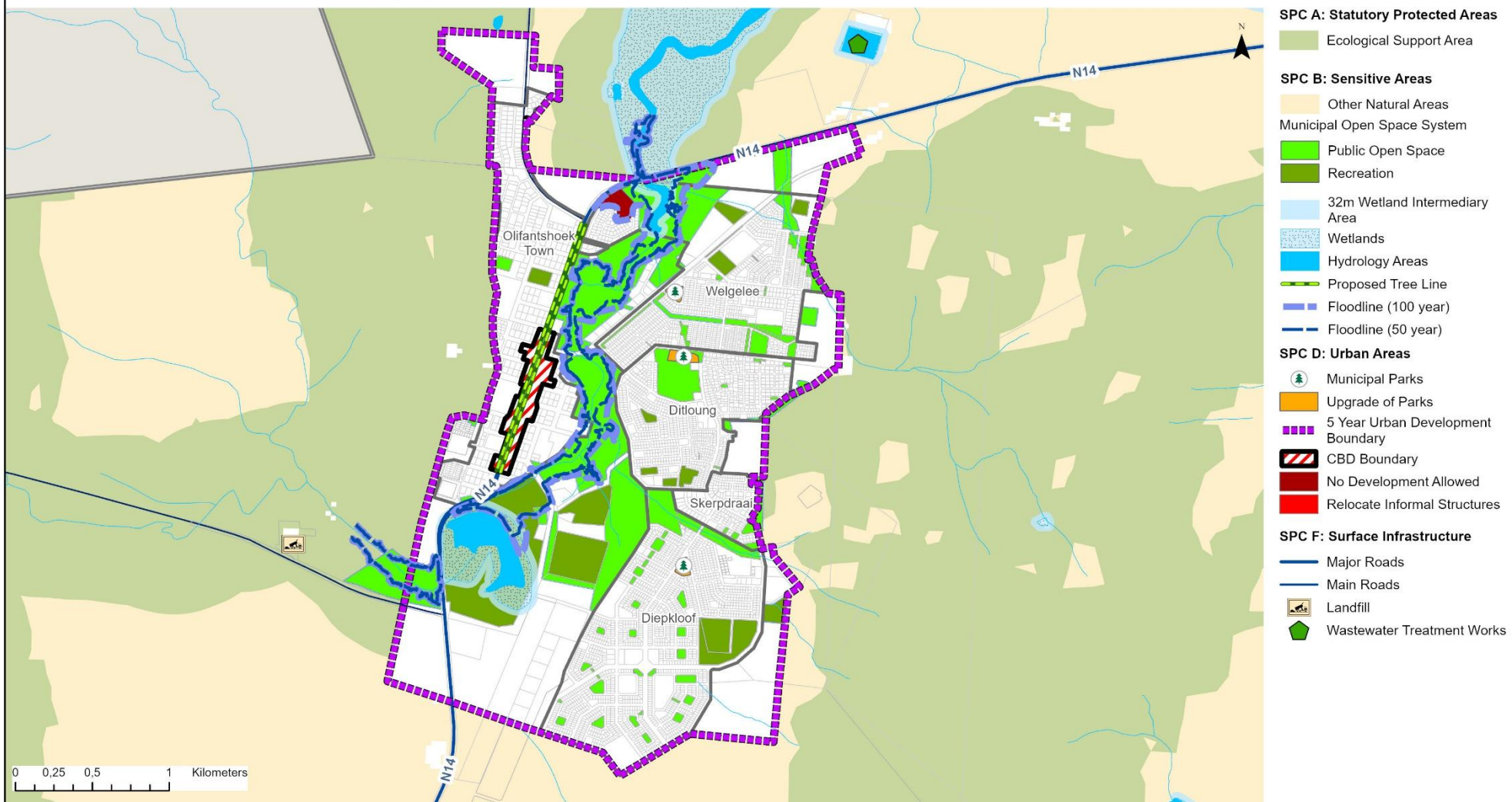
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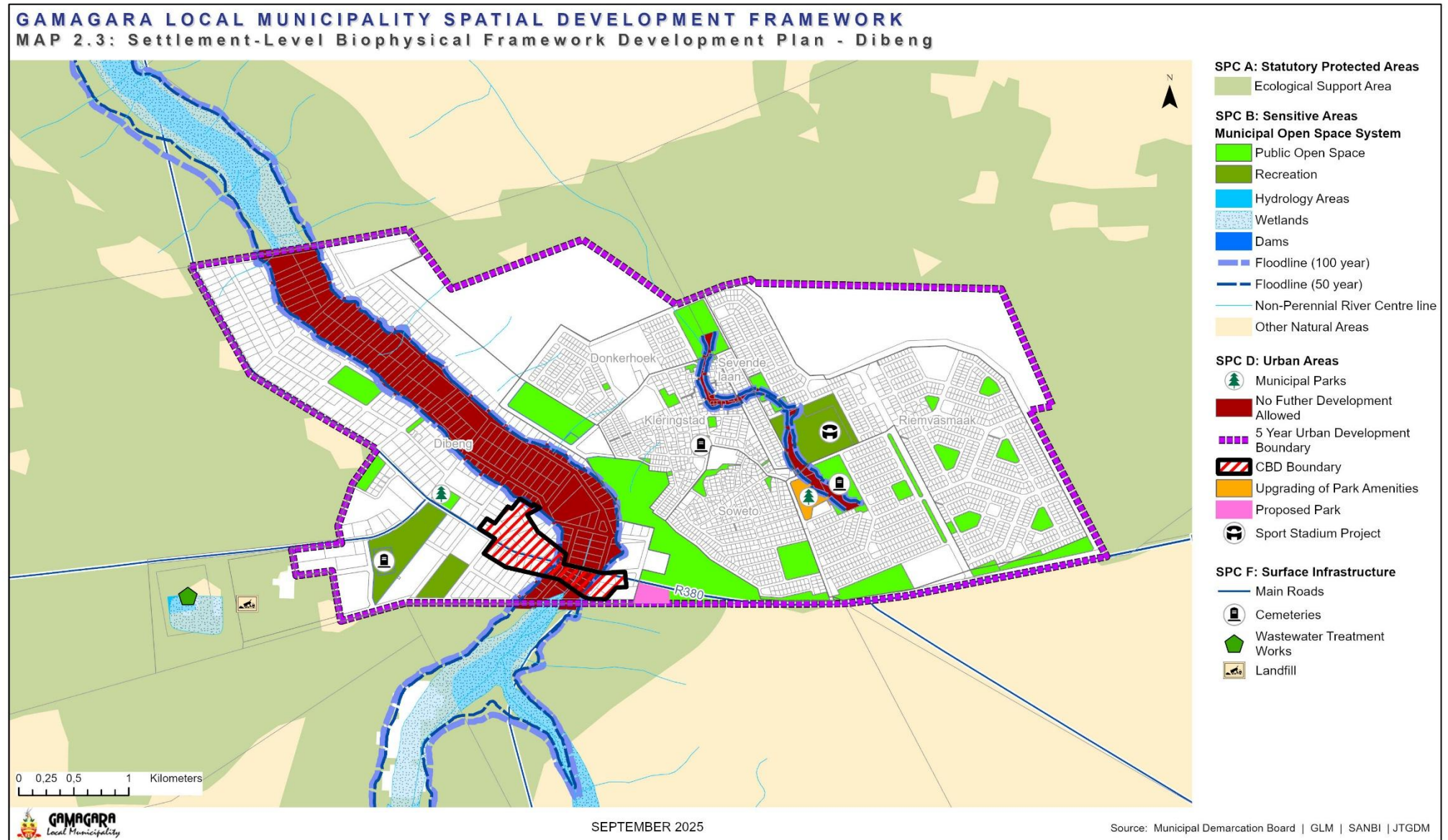
MAP 2.1: Settlement-Level Biophysical Framework Development Plan - Kathu



GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

MAP 2.2: Settlement-Level Biophysical Framework Development Plan - Olifantshoek





7. Agricultural Framework Development Plan

7.1 Introduction

Agriculture in Gamagara Local Municipality has long been constrained by arid conditions, limited water, and fragile soils. Today, however, new opportunities are emerging to reposition agriculture as a pillar of post-mining diversification and resilience. By combining mining land remediation, orchard expansion, invasive species valorisation, livestock development, and community food gardens, Gamagara can build a multi-layered agricultural system that secures food, creates jobs, builds skills, and restores ecological assets.

This Agricultural Framework Development Plan provides spatial guidance to embed agriculture into the municipality's economic future, aligned with SPLUMA principles of sustainability and resilience. It directly supports the Gamagara LED Strategy's emphasis on economic diversification through high-value agriculture and agro-processing, as well as its focus on education and skills development through initiatives such as an agricultural experiential farm in partnership with Sol Plaatje University.

7.2 Spatial Context

The agricultural landscape of Gamagara is dominated by livestock grazing, with pockets of irrigated production near the Gamagara River and settlement edges. Soils and climate restrict broad-scale cropping, but innovative pilots demonstrate new potential. The Sishen Iron Orchard, established on rehabilitated mine land, has proven that degraded land can be converted into productive orchards. This initiative provides a scalable model for post-mining land transformation.

The 2025 Gamagara LED Strategy and spatial proposals identified agriculture as a strategic diversification sector, with opportunities in:

- ▶ Municipal commonage farming and peri-urban agriculture.
- ▶ Introduction of high-value arid-region orchard crops (pistachio, pecan).
- ▶ Circular economy initiatives (Prosopis harvesting into fodder, biochar, biomass).
- ▶ Agro-processing and value-addition linked to orchards and livestock.
- ▶ Community food gardens for food security, resilience, and participation.

7.3 Key Opportunities and Considerations

The first opportunity lies in post-mining land remediation and agricultural reuse. Mine closure land can host orchards, agroforestry, and livestock, ensuring landscapes continue to generate economic and social value.

The second is the development of strategic orchard crops. Pistachios and pecans thrive in arid climates and have strong global demand. Once pistachio production reaches ~1,000 ha, viability opens for a local processing facility, unlocking agro-processing and manufacturing opportunities.

The third is community food gardens in every settlement. Food gardens enhance household and community food security, reduce dependence on external supply chains, and build resilience. Linking gardens to community feeding schemes, local restaurants, and grocery retailers can create localised supply chains. With technical support in crop selection, business practices, and marketing, food gardens become stepping stones into sustainable livelihoods and entrepreneurship.

The fourth is invasive species management as an agricultural input. Harvested Prosopis can be processed into biochar, biomass energy, and fodder, creating circular value chains while restoring grazing and groundwater. Biochar can also be integrated into soil rehabilitation programmes, improving soil fertility for new crops.

The fifth opportunity is new arid-region technologies (e.g. wind tunnels and controlled environments) to diversify crops and improve productivity.

Finally, agriculture can be an educational and skills development driver. An experiential farm and innovation hub should be developed in partnership with Sol Plaatje University, focusing on orchard crops, Prosopis valorisation, climate-smart farming, and livestock (including goats, which are well-suited to arid conditions). This farm would build youth capabilities, provide research opportunities, and reinforce Gamagara's education sector development aspirations.

7.4 Settlement-Level Agricultural Considerations

Agricultural opportunities in Gamagara must be tailored to the specific spatial, environmental, and community contexts of each settlement. While post-mining land remediation and large-scale orchards provide regional impact, localised interventions

such as community food gardens, peri-urban farming, and invasive species management ensure that each town — and community landholding such as the Babatas CPA — participates in and benefits from the agricultural transition.

1. **Kathu and surrounds:** Prioritise post-mining land repurposing for orchards and livestock. Expand the Iron Orchard into a flagship agricultural hub, and establish large-scale pistachio and pecan production. Promote peri-urban food gardens on municipal commonage, linked to feeding schemes and local supply chains.
2. **Olifantshoek:** Utilise restricted floodline zones for low-impact agricultural uses such as agroforestry, horticulture, and food gardens. Community gardens can anchor food security while corridors of rehabilitated land host small-scale orchards.
3. **Dibeng:** Leverage proximity to the Gamagara River for smallholder irrigation projects and food gardens, complemented by fodder production. Surrounding areas should be targeted for Prosopis harvesting and processing into fodder and biochar.
4. **Babatas Community Property Association:** Support agricultural development on community-owned land through a community food garden, linked to feeding schemes and local supply chains. The Babatas area should also be included in invasive species management programmes, creating opportunities for Prosopis harvesting and processing alongside training and technical support.

7.5 Spatial Guidance and Directives

To realise the full potential of agriculture as a driver of diversification, resilience, and food security, clear spatial directives are required. These directives ensure that agricultural initiatives — from community food gardens to large-scale orchards and agro-processing — are developed in appropriate locations, supported by climate-smart practices, and embedded within a circular economy that restores ecological assets while building local skills and livelihoods.

1. **Repurpose rehabilitated mining land:** Convert into orchards, agroforestry, and livestock production.
2. **Scale the Iron Orchard model:** Expand pecan and pistachio orchards; target ~1,000 ha pistachios to justify a local processing facility.
3. **Strengthen agro-processing:** Establish nut processing and packaging facilities, fodder processing, and renewable-energy powered cold storage.

4. **Develop community food gardens in every settlement:** Link gardens to feeding schemes, restaurants, and retailers; provide technical and business support to enhance sustainability.
5. **Promote a multi-layered agricultural system:** From community food gardens to peri-urban farming, to large-scale orchards and livestock, creating a comprehensive system from production to harvesting to processing and recycling.
6. **Valorise invasive species:** Establish Prosopis harvesting areas; process into fodder, biochar, and biomass energy for soil rehabilitation and agricultural use.
7. **Apply climate-smart farming practices:** Encourage water-efficient irrigation, soil rehabilitation using biochar, and new arid-region technologies (wind tunnels, shade nets).
8. **Promote agricultural research and education:** Establish an experiential farm and research hub with Sol Plaatje University, incorporating orchards, biochar, arid-region technologies, and livestock (including goats).
9. **Safeguard environmental assets:** Apply all land management objectives and controls for CBAs and ESAs as per Table 3.
10. **Leverage partnerships and investment:** Align mining houses, universities, agribusiness, and local farmers in co-investing and scaling agricultural innovation.

7.6 Conclusion

The Agricultural Framework Development Plan positions agriculture as a strategic growth sector and resilience mechanism for Gamagara. By integrating community food gardens, peri-urban farming, large-scale orchards, livestock, and invasive species valorisation, the municipality creates a multi-layered agricultural system that spans from subsistence to export markets.

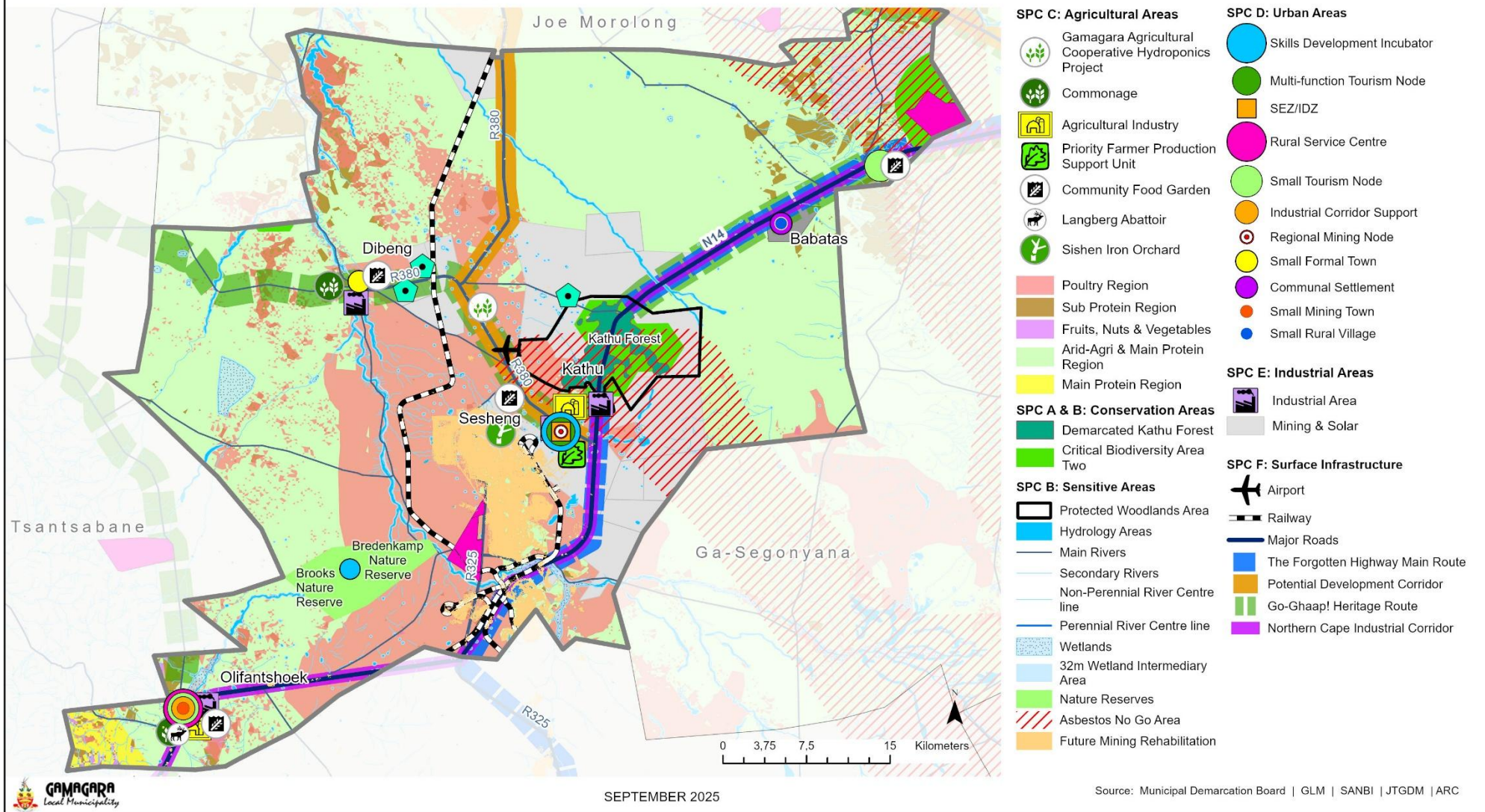
This system is comprehensive: from crop and livestock production, to harvesting, processing, and recycling, supported by education, research, and technical assistance. At the household level, food gardens strengthen food security, community participation, and resilience. At the commercial level, pistachio and pecan orchards, coupled with processing facilities, unlock agro-processing and manufacturing opportunities. Circular economy initiatives such as Prosopis valorisation close the loop, restoring ecological function while generating value.

With the establishment of an experiential farm in partnership with Sol Plaatje University, including orchard crops, circular agriculture, and livestock such as goats, agriculture will also become a driver of skills development and knowledge creation, equipping Gamagara's youth to participate in its agricultural and agro-processing future.

In this way, agriculture is repositioned not only as a contributor to livelihoods, but as a central pillar of Gamagara's post-mining economy, expanding the stock of ecological assets, strengthening food systems, and anchoring inclusive and climate-resilient development.

GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

MAP 3: Agricultural Framework Development Plan



8. Tourism Framework Development Plan

8.1 Introduction

Tourism is an emerging pillar in Gamagara's diversification strategy, with strong potential to build a resilient, inclusive, and sustainable local economy. While historically overshadowed by mining-related travel, Gamagara is endowed with unique natural landscapes, cultural heritage, world-class sports facilities, and expanding education infrastructure that together provide the basis for a diverse tourism economy.

This framework provides spatial and programmatic guidance to reposition tourism from a peripheral activity to a strategic economic sector, aligned with the Gamagara LED Strategy's vision for outdoor, sports, education, cultural, and heritage tourism. Importantly, many of the events, festivals, and expos identified in the LED Strategy are currently concepts in early development, but they hold strong potential to anchor weekend and holiday visitation if scaled and marketed effectively.

8.2 Spatial Context

Tourism activity in Gamagara is concentrated around Kathu and its surroundings, leveraging assets such as the Kathu Camel Thorn Forest, the Sishen Golf Course, multiple sports centres, and over forty hotels and guest houses. Regional tourism routes, including the Go-Ghaap! Heritage Route and the Forgotten Highway Route, provide access and visibility. However, much of the infrastructure — particularly sports and hospitality — was developed to serve the mining economy and is underutilised during weekends and holidays, indicating a significant untapped market.

Olifantshoek and Dibeng also possess notable tourism potential, including the Kgosi Toto Caves, Langeberg Hiking Trail, Kaapval Craton, and Red Sands (located on the N14 between Kuruman and Kathu). The presence of lodges and related tourism infrastructure nearby Dibeng creates scope for eco-tourism activities such as guided walks, birdwatching, and cultural experiences. In addition, the cluster of renewable energy and solar facilities around Dibeng opens opportunities for energy tourism, with solar tours showcasing Gamagara's role in South Africa's energy transition.

Across all towns, attractive town entrances and clear wayfinding should be developed or upgraded, ensuring that settlements project a welcoming image to passing business traffic, regional tourists, and leisure travellers alike.

8.3 Key Opportunities and Considerations

The first opportunity lies in weekend and holiday tourism. Diversifying away from weekday mining travel, Gamagara can grow leisure visitation through festivals, culinary circuits, expos, and cultural gatherings such as the Wild Food & Braai Festival, Taste of the Kalahari, and TECHTREK Youth Expo. While these are still concept-stage initiatives, they have the potential to become signature tourism products.

The second opportunity is sports tourism. With world-class golf, multiple sports centres, and a tradition of high-performance training, Gamagara can host tournaments, endurance challenges (e.g. Roaring Kalahari Ultra Challenge), and wellness events such as Kathu Active. Partnerships with provincial and national sporting associations will ensure facilities meet code requirements, qualify for official recognition, and provide mentoring and development opportunities for local athletes.

The third is education tourism. Gamagara's training centres, schools, and vocational colleges — including SIVOS and NCR TVET — combined with initiatives like the TECHTREK Youth Skills & Innovation Expo, position the municipality as a hub for skills-related visitation. This form of tourism is not only about drawing learners, educators, and investors, but also about strengthening reskilling and upskilling opportunities for the local workforce. In this way, education tourism directly supports the development of skills pipelines for post-mining economic diversification, linking training and knowledge exchange to the municipality's broader economic transition.

The fourth is outdoor and eco-tourism. Hiking, mountain biking, birdwatching, motorsports, and can be anchored in Kathu Forest, Red Sands, and eco-lodges near Dibeng. Around Dibeng specifically, eco-lodges can be complemented with solar and renewable energy tours, highlighting Gamagara's contribution to South Africa's energy transition.

The fifth is mining and industrial heritage tourism. Gamagara's mining identity can be leveraged through mine tours, heritage storytelling, and events such as the Iron & Heritage Frontier Festival.

Finally, cultural and heritage tourism has scope to grow through activation of heritage sites (e.g. Kgosi Toto Caves) and events showcasing indigenous food, crafts, and storytelling traditions.

8.4 Settlement-Level Tourism Considerations

Tourism development must be tailored to the character and assets of each settlement:

1. **Kathu and surrounds:** Anchor destination for sports, conference, and event tourism. Prioritise utilisation of existing hospitality and sport assets for tournaments, wellness festivals, and golf tourism. Establish a tourism information centre and enhance town entrances and wayfinding.
2. **Olifantshoek:** Prioritise cultural and nature-based tourism through activation of the Langeberg Hiking Trail, Kgosi Toto Caves, and SMME opportunities such as craft markets. Upgrade town entrances to attract passing travellers.
3. **Dibeng:** Develop eco-tourism offerings through lodges and cultural activities, complemented by solar/renewable energy tours. Enhance settlement entrances and signage to increase visibility to passing tourists.
4. **Regional routes:** Strengthen positioning along the Go-Ghaap! Heritage Route and Forgotten Highway Route, linking Gamagara attractions into broader circuits.

8.5 Spatial Guidance and Tourism

To unlock tourism's potential, the following directives apply:

1. **Diversify tourism offerings:** Develop leisure-focused products to rebalance weekday mining travel with weekend and holiday visitation.
2. **Strengthen sports tourism:** Package and market golf, endurance, and multi-sport assets; partner with sports associations to ensure facilities meet sporting codes, are fit for official tournaments, and provide mentoring and development for local athletes.
3. **Promote education tourism:** Leverage training centres, expos, and skills hubs to attract learners, educators, and investors, while supporting local reskilling and the development of post-mining skills pipelines.
4. **Activate outdoor/nature and eco-tourism:** Formalise trails, reserves, and eco-lodge offerings; integrate birdwatching, hiking, stargazing, and eco-cultural experiences.

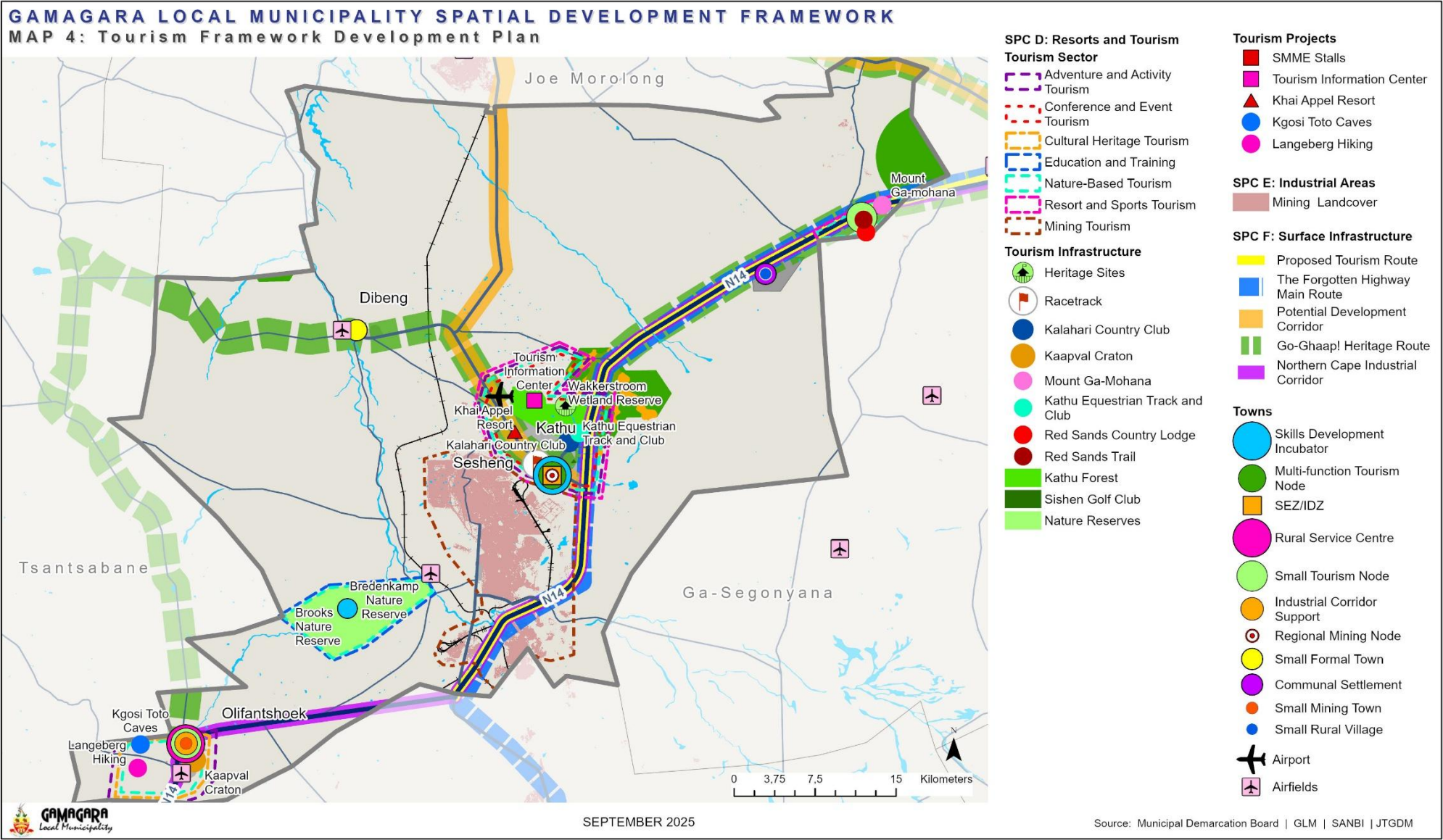
5. **Develop energy tourism:** Create **solar and renewable energy tours** around Dibeng to showcase Gamagara's role in the green economy.
6. **Develop mining/heritage tourism:** Transform operational and historic sites into visitor products, supported by industrial heritage exhibitions.
7. **Expand cultural tourism:** Activate heritage sites and festivals to highlight food, crafts, and indigenous knowledge.
8. **Improve tourism infrastructure:** Establish a tourism information centre in Kathu; revitalise Khai Appel Resort; upgrade town entrances, signage, and wayfinding in all settlements.
9. **Support local enterprises:** Facilitate SMME stalls, craft markets, and event-linked opportunities across towns.
10. **Foster partnerships:** Work with sports associations, cultural bodies, universities, and private operators to co-develop tourism products.
11. **Embed sustainability:** Ensure all tourism projects conserve ecological and cultural assets while generating local benefit.

8.6 Conclusion

The Tourism Framework Development Plan positions Gamagara as a multi-dimensional destination integrating leisure, sports, education, eco-tourism, heritage, and culture. By rebalancing the tourism economy toward weekend and holiday visitation, the municipality can diversify revenue streams, support local businesses, and strengthen resilience against mining downturns.

Events, festivals, and expos are currently conceptual but promising initiatives, requiring development into flagship products. Sports and education tourism stand out as immediate strengths. In particular, education tourism reinforces Gamagara's reskilling and human capital agenda, strengthening pipelines of skills that are critical to post-mining diversification. Eco-tourism, solar energy tours, cultural heritage, and mining heritage provide complementary depth. Upgraded town entrances and wayfinding will ensure all settlements project a welcoming image to passing travellers, encouraging stopovers and extended stays.

Through this layered approach, Gamagara will evolve into a vibrant tourism hub — activating underutilised infrastructure, celebrating its unique identity, and embedding tourism as a central pillar of the post-mining economic transition.



9. Renewable Energy Framework Development Plan

9.1 Introduction

Renewable energy is poised to become the largest economic growth sector in Gamagara, with the potential to absorb labour, diversify the economy, and anchor the municipality's post-mining transition. Gamagara currently hosts four operational solar facilities, while the broader Gamagara–Tsantsabane–Joe Morolong Renewable Energy Development Zone accommodates nine active projects and has 78 DEA-approved facilities in the pipeline. This scale makes the Zone one of the most significant renewable energy clusters in South Africa, capable of transforming the regional economy.

The rapid expansion of renewable generation creates a demand not only for land and transmission infrastructure, but also for specialised manufacturing, servicing, and innovation capacity. Solar and CSP plants require ongoing maintenance, component replacement, and technical upgrades, while the growth of the sector introduces opportunities in panel assembly, grid management systems, and storage technologies. Without local manufacturing and services, much of this value will be captured elsewhere, reducing the developmental impact on Gamagara and its neighbouring municipalities.

Kathu is already recognised as a regional manufacturing hub, with a growing industrial base, logistics connectivity via the N14 corridor, and the planned Kathu Industrial Park (KIP). This positions it strongly to host a renewable energy manufacturing and services platform, designed as an eco-industrial hub to serve the entire Renewable Energy Development Zone. By embedding renewable energy supply chains in Kathu, Gamagara can capture a greater share of the value chain, stimulate industrial diversification, and ensure long-term employment growth.

This framework builds on the Gamagara LED Strategy, which identifies the green and circular economy as a catalytic sector for transformation, and the spatial proposals, which position renewable energy at the heart of both diversification and environmental sustainability.

9.2 Spatial Context

Gamagara sits within the Gamagara–Tsantsabane Renewable Energy Development Zone, part of the North West Power Corridor. The area is criss-crossed by Eskom's 400 kV, 275 kV, 132 kV and 66 kV transmission networks, anchored by the Ferrum substation near Kathu. Eskom plans to strengthen this infrastructure with the Ferrum–Moodkodi 400 kV line, further unlocking capacity for large-scale renewable integration.

The municipality already hosts four operational utility-scale solar facilities, including the Kathu Solar Park (100 MW CSP) and large PV installations. Across the broader Renewable Energy Development Zone, a pipeline of 78 approved projects will contribute to South Africa's clean energy transition. Together, operational and pipeline projects are expected to generate 23,000+ construction jobs and over 10,000 permanent jobs, providing an employment base to offset anticipated mine closures.

9.3 Key Opportunities and Considerations

A renewable energy opportunity matrix is presented in **Table 4**.

The first opportunity is renewable energy production leadership. Gamagara, together with Tsantsabane and Joe Morolong, can consolidate its role as one of South Africa's key renewable hubs, with more than 30 commercial-scale projects positioning the Zone as a net exporter of clean energy.

The second opportunity lies in building a renewable energy manufacturing and services platform. The Kathu Industrial Park (KIP), designated under SIP 5, should be developed as an eco-industrial hub specialising in renewable technology, innovation, and maintenance infrastructure. By servicing the entire Renewable Energy Development Zone, it will capture economies of scale and create strong local supply chains.

The third opportunity is in skills development and reskilling. Renewable energy requires technical expertise in system design, grid integration, storage, and efficiency optimisation, as well as manufacturing and project finance skills. Events like TECHTREK Gamagara and the Solar Horizons Energy Tourism Week — while still early, conceptual initiatives — can be leveraged to raise awareness, attract youth, and build pipelines of skilled workers.

TABLE 4: RENEWABLE ENERGY OPPORTUNITY MATRIX

Opportunity Area	Key Assets	Proposed Projects/Initiatives	Potential Impacts
Utility-Scale Production	4 operational solar facilities in Gamagara; 9 active in Zone; 78 DEA-approved projects; Ferrum substation; Eskom 400 kV network	Expansion of PV and CSP farms; fast-tracking DEA-approved projects; Ferrum–Moodkodi 400 kV line	Largest sector for job creation; stable long-term power supply; major investment inflows
Manufacturing & Services	Kathu Industrial Park (SIP 5 node); N14 logistics corridor; Kathu as regional manufacturing hub	Develop eco-industrial hub for renewable component manufacturing, maintenance, and innovation	Diversification into manufacturing; stronger local supply chains; technology exports
Skills Development & Reskilling	SIVOS, NCR TVET, Sol Plaatje University partnerships; TECHTREK Expo	Renewable skills training, apprenticeships, experiential learning; TECHTREK and Solar Horizons expos	Skills pipeline for post-mining transition; labour absorption; youth empowerment
Tourism & Education Linkages	Solar farms near Dibeng; Kathu as regional hub; eco-lodges	Solar farm tours; renewable energy expos; education tourism programmes	Promote Gamagara as energy transition hub; community awareness; niche tourism economy
Circular Economy & Recycling	Anticipated decommissioning wave from mid-2030s; some damaged/repowered assets already	Establish panel and component recycling facilities; waste-to-value industry clustering	Early mover advantage; future-proofed circular economy; new industrial opportunities
Community Benefit-Sharing	Local procurement, SED/SLP frameworks; renewable operator CSI programmes	Renewable Energy Forum; coordinated CSI and community projects	Improved livelihoods; inclusive growth; stronger municipal–private partnerships

The fourth opportunity is linkages with tourism and education. Solar farm tours, renewable energy expos, and academic exchanges can position Gamagara as a destination for energy tourism and education tourism, while supporting community awareness and acceptance.

The fifth opportunity is in circular economy and recycling niches. While large-scale decommissioning of solar panels is expected from the mid-2030s onwards, some recycling and reclamation needs already exist due to damaged or repowered installations. Planning ahead now will position Gamagara to capture future waste-to-value opportunities, including panel recycling, component recovery, and integration into a circular energy economy.

The sixth opportunity is cooperation with renewable energy operators. With dozens of new IPPs establishing operations in the municipality, there is significant scope for Gamagara Local Municipality to work with these operators to align corporate social investment (CSI) programmes with community and enterprise development priorities in the Gamagara LED Strategy. This will ensure that company investments support both municipal priorities and the values and aspirations of renewable producers, building shared value for all stakeholders.

9.4 Spatial Guidance and Directives

To strengthen renewable energy as a pillar of diversification and resilience, the following directives apply:

1. **Prioritise DEA-approved renewable energy projects** in the Gamagara functional zone, accelerating permitting and land use processes.
2. **Strengthen transmission infrastructure** by supporting Eskom's Ferrum–Moodkodi 400 kV line and associated substations to integrate renewable energy into the grid.
3. **Develop the Kathu Industrial Park as a renewable-focused eco-industrial hub**, specialising in manufacturing, technology innovation, and maintenance of renewable energy systems.
4. **Enable circular economy linkages**, including solar panel recycling and energy component reclamation, to build a long-term waste-to-value economy.
5. **Promote workforce reskilling** by linking renewable energy projects with training programmes at SIVOS, NCR TVET, and other education hubs.
6. **Leverage events and expos** (e.g. Solar Horizons Week, TECHTREK) to build public awareness, attract investment, and establish skills pipelines for youth.
7. **Create renewable energy tourism products**, including solar farm tours, demonstration facilities, and educational exchanges.
8. **Ensure community benefit-sharing** through local procurement, employment targets, and social projects funded by renewable producers.
9. **Establish a Renewable Energy Forum** between the municipality and operators to coordinate CSI investments, procurement opportunities, and community development initiatives.
10. **Align land use management with renewable energy expansion**, enabling efficient site approvals while protecting CBAs, ESAs, and community rights.

9.5 Conclusion

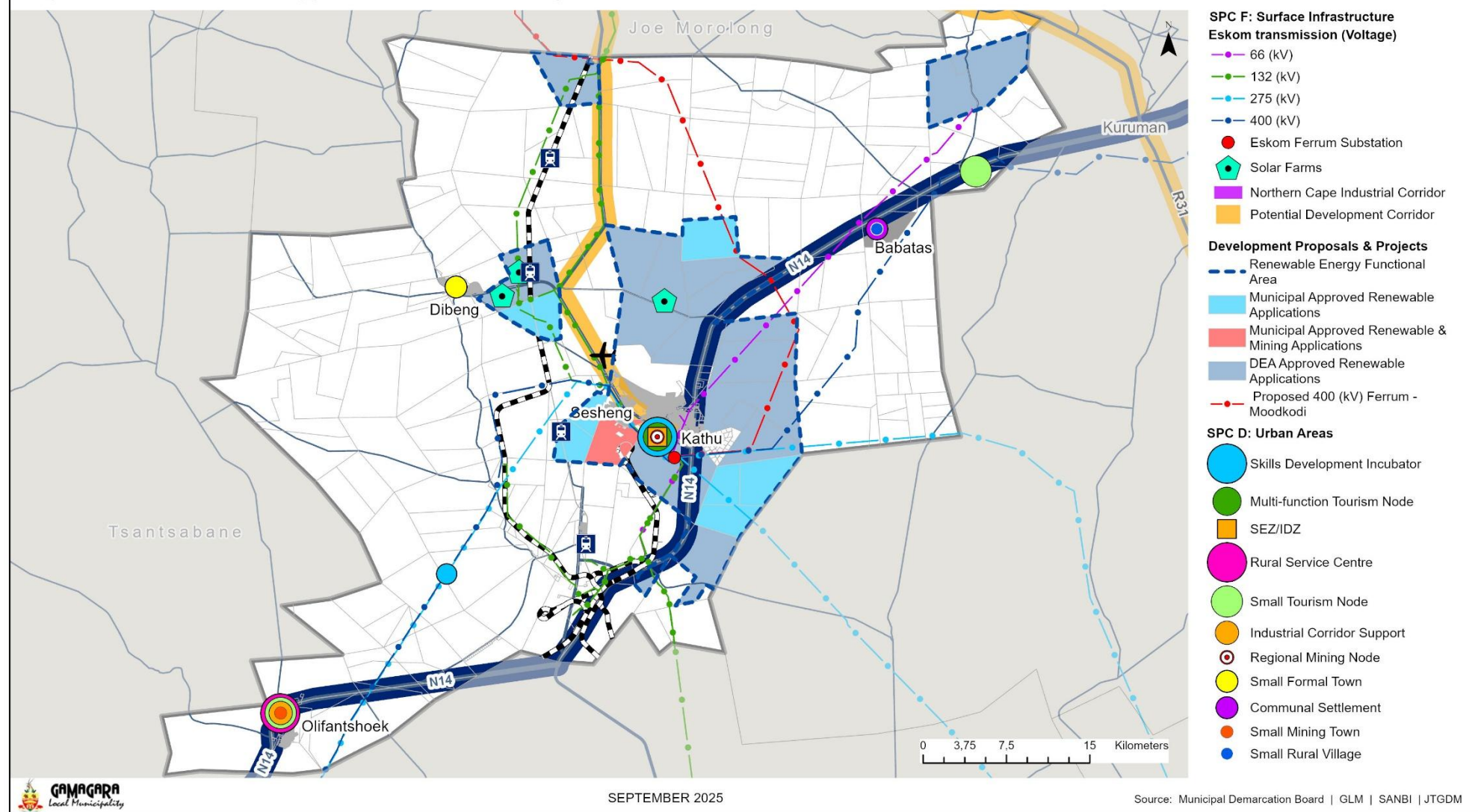
The Renewable Energy Development Framework Plan positions Gamagara as a national leader in renewable energy generation, innovation, and services. With four active projects locally, and more than 30 projects underway or approved across the Renewable Energy Development Zone in Gamagara alone, the municipality and its neighbours are uniquely placed to absorb thousands of jobs, attract investment, and secure long-term resilience.

Renewable energy will not only replace mining as the dominant economic sector, but also create manufacturing, training, and tourism spin-offs that diversify and deepen local economic opportunities. The integration of renewable energy with the Kathu Industrial Park ensures that production is coupled with industrial capacity and innovation, while education and tourism linkages expand the sector's social footprint. Importantly, Gamagara must also plan ahead for the circular economy. While large-scale solar panel decommissioning is expected from the mid-2030s onwards, some recycling and reclamation needs already exist due to damaged or repowered assets. By preparing early, Gamagara can secure a first-mover advantage in panel recycling, component recovery, and waste-to-value industries, embedding circular economy principles at the heart of its renewable future.

In this way, renewable energy becomes more than a source of power — it is a catalyst for post-mining transformation, providing a foundation for economic diversification, labour absorption, and community resilience in Gamagara's future.

GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

Map 5: Renewable Energy Framework Development Plan



10. Mining and Manufacturing Framework Development Plan

10.1 Introduction

Mining has long been the backbone of Gamagara's economy, anchored by the world-class iron ore operations of Kumba Iron Ore's Sishen Mine and Assmang's Khumani Mine. These mines have defined the municipality's growth, employment, and infrastructure platforms. However, the municipality must now actively manage the risks of resource depletion and eventual mine closures, while ensuring that mining continues to play a central role in regional supply chains for as long as reserves and technology allow.

At the same time, Gamagara is building the foundations for a diversified, innovation-driven manufacturing economy. Kathu already functions as the regional industrial hub, home to $\pm 277,763$ m² of industrial space, a concentration of large mining suppliers, and the SIVOS training centre. With the planned R380 Industrial Complex — comprising the Kathu Extension 2 industrial area, the Kathu Industrial Park, and the Farm 736 Industrial Development — Gamagara will transition from reliance on raw mineral extraction to value-adding beneficiation, machinery production, agro-processing, renewable energy supply chains, and circular economy industries.

It is also the aspiration of Gamagara to continue serving as the regional mining and manufacturing centre even beyond mine closures in its own jurisdiction. Kathu is already the preferred residential and business location for senior executives of mining operations across Gamagara, Tsantsabane, and Joe Morolong, owing to its rich amenities, transport connectivity, and services platform. Going forward, Gamagara intends to remain the strategic hub of the Gamagara Mining Corridor, supporting both mining and manufacturing as the dual drivers of post-mining transformation.

10.2 Spatial Context

Kathu functions as the regional mining node, with a combination of infrastructure, amenities, and industrial platforms that make it ideally placed to anchor both mining and manufacturing activities:

- It is the starting point of the Sishen–Saldanha iron ore export railway line, a nationally strategic logistics corridor.

- It hosts the Sishen commercial airport, serviced by daily flights to and from Johannesburg, and supported by car rental companies such as Avis and Europcar, linking senior management, contractors, and consultants to the mining corridor.
- Kathu offers multiple accommodation and conference venues, catering to the large weekly influx of mining-related business visitors.
- It is home to the dominant mining suppliers of heavy industrial vehicles, equipment, machinery, and services, including Komatsu, Barloworld, Epiroc, Namlog, Otraco, and others.
- Its industrial platform already comprises $\pm 277,763$ m² GLA of industrial space in Kathu alone, with additional industrial and warehousing capacity being continuously added.
- The SIVOS mining training centre in Kathu provides a nationally significant pipeline of artisans, technicians, and engineers.

Alongside the existing Kathu Extension 2 industrial area, the R380 Industrial Complex is emerging as the core industrial cluster of Gamagara. This includes the expansion of Kathu's industrial base through the planned Kathu Industrial Park (KIP) and the Farm 736 Industrial Development, which together will host renewable energy manufacturing, beneficiation activities, logistics facilities, agro-processing, and circular economy industries. The Bestwood development on the N14 alongside Kathu continues to attract additional mining suppliers.

Beyond Kathu, Gamagara also includes Khumani Mine near Dibeng, beneficiation infrastructure, and smaller industrial nodes in Olifantshoek and Dibeng, where SMME-oriented hubs are being established (e.g., Assmang's Olifantshoek SLP-funded light industrial park).

This unique combination of strategic infrastructure, logistics, suppliers, industrial land, and training facilities underpins Kathu's role as the regional anchor for mining, beneficiation, and the transition into manufacturing diversification.

10.3 Key Opportunities and Other Considerations

A mining and manufacturing opportunity matrix is presented in **Table 5**.

TABLE 5: MINING AND MANUFACTURING OPPORTUNITY MATRIX

Opportunity Area	Key Assets	Proposed Projects/Initiatives	Potential Impacts
Support to Mining	LED Strategy priorities; Gamagara housing projects; eco-industrial park plans	Expand industrial base with green principles; affordable housing initiatives	Strengthen mining competitiveness; retain executives; support decarbonisation efforts
Sustaining Mining	Sishen, Khumani, rail corridor	Extend mine life through UHDMS; integrate closure & remediation planning	Maintain employment base; smooth transition; reduced closure shocks
R380 Industrial Complex	Kathu Extension 2; Kathu Industrial Park; Farm 736 Industrial Development	Develop eco-industrial hub: beneficiation, renewable supply chains, agro-processing	Catalytic anchor for diversification; attract investors; cluster synergies
Beneficiation & Downstream	Iron ore reserves; smelter proposals; mining expertise	Iron ore smelter; steel/alloys; fabrication for mining & energy	Value addition; higher GVA; industrial job creation
Machinery & Components	Supplier networks in Kathu	Localised production of mining equipment, wear parts, conveyor/drilling systems	Strengthened supplier base; import substitution; enhanced local capabilities
SMME & Skills Development	SIVOS training centre & NCR TVET	SMME incubation; supplier development; technical training; industrial apprenticeships	Inclusive growth; SMME participation; youth employment
Circular Economy Niches	Mining waste, discarded tyres, tailings	Waste reclamation center, tyre granulation plant; tailings reprocessing; industrial waste-to-value	Environmental remediation; new industrial value chains; green jobs
Cross-Sector Integration	LED Strategy agriculture & energy linkages	Pistachio nut processing plant; biochar production; renewable component supply	Agro-industrial growth; renewable synergies; education and innovation linkages

Valorisation of Iron Ore Tailings

Context

Iron ore mining in Gamagara has produced extensive tailings deposits over decades of operation. These are typically viewed as waste yet advances in materials science and circular economy practices show their potential as a valuable secondary resource stream. Valorisation can both reduce environmental liabilities and create new industrial opportunities.

Key Opportunity Areas

- ▶ **Construction materials:** Tailings can substitute for sand and clinker in cement, concrete, bricks, blocks, tiles, and road base materials — directly supporting Gamagara's housing and infrastructure programmes.
- ▶ **Metallurgical recovery:** Emerging technologies can extract residual iron and trace minerals, extending resource value.
- ▶ **Geopolymer and advanced materials:** Tailings are a feedstock for low-carbon geopolymers, ceramics, and glass.
- ▶ **Carbon management:** Silicate-rich tailings can mineralise CO₂, opening avenues for carbon credits and climate-aligned industrial innovation.
- ▶ **Eco-industrial linkages:** Integration into the R380 Industrial Complex can enable industrial symbiosis, reducing reliance on imported inputs and embedding tailings within local value chains.

Potential Impacts

- ▶ Reduced ecological footprint of mining and improved mine closure outcomes.
- ▶ Lower construction costs for **affordable housing and infrastructure**.
- ▶ Creation of **green industrial jobs** and attraction of investment in advanced materials.
- ▶ Position Gamagara as a **circular economy leader** in the mining and manufacturing corridor.

Sources:

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A key opportunity is for Gamagara to support the mining industry itself by strengthening the enabling environment in which it operates. The LED Strategy identifies two priority interventions:

1. Expanding the industrial base and embedding green, circular economy principles in eco-industrial parks. This will help mines to decarbonise their value chains and remain competitive under evolving trade measures such as the EU Carbon Border Adjustment Mechanism (CBAM).
2. Increasing the supply of affordable housing, catering to different lifestyle needs and income groups, thereby reinforcing Kathu's role as the preferred base for senior mining executives, contractors, and workers across the corridor.

The second opportunity is to sustain mining while preparing for transition. Continued beneficiation investments such as UHDMS extend the life of Sishen, but proactive planning for eventual downscaling is critical. Mine closure planning must be integrated with land remediation, reuse of infrastructure, and skills transfer.

The third opportunity is the development of the R380 Industrial Complex, anchored by the Kathu Industrial Park and Farm 736 Industrial Development. This complex will support renewable energy supply chains, iron ore beneficiation, agro-processing, circular economy niches, and light manufacturing for regional markets.

The fourth opportunity is to develop beneficiation and downstream industries. These include a potential iron ore smelter, steel and alloy industries, and fabrication linked to mining equipment, renewable energy, and construction sectors.

The fifth opportunity is to broaden the industrial base through specialised machinery and component manufacturing. Building on the concentration of large mining suppliers in Kathu, there is scope for local production and servicing of heavy machinery, vehicles, conveyor systems, drilling equipment, and wear-resistant parts.

The sixth opportunity is SMME and skills development. The Olifantshoek light industrial hub can serve as platforms for smaller enterprises, supported by supplier development programmes, incubation, and training.

The seventh opportunity lies in circular economy manufacturing niches. Discarded mining tyres can be processed through granulation plants to supply rubber for roads, construction, and industrial applications. Tailings reprocessing and waste reclamation further support waste-to-value industries.

The eighth opportunity is cross-sectoral integration with agriculture and renewable energy:

- ▶ Establishing a pistachio nut processing facility at the scale of ~1,000 ha orchards, which will create value-adding agro-industrial activity.
- ▶ Developing biochar production linked to invasive species management and agricultural productivity.
- ▶ Building out renewable energy manufacturing supply chains for solar panels, inverters, batteries, and O&M services, as identified in Section 9.

10.4 Spatial Guidance and Directives

To ensure that mining and manufacturing continue to drive Gamagara's transition while supporting diversification, a clear set of spatial directives is required. These directives focus on consolidating Kathu's role as the regional mining and manufacturing hub, anchoring growth in the R380 Industrial Complex, and embedding beneficiation, circular economy, agro-processing, and renewable-linked manufacturing within a spatially coherent and climate-resilient development framework.

1. **Integrate mine closure and remediation plans** into the municipal SDF and LED Strategy, ensuring land repurposing for industrial, agricultural, and community uses.

2. **Prioritise the R380 Industrial Complex** (Extension 2, Kathu Industrial Park, Farm 736) as the flagship cluster for manufacturing diversification, with strong linkages to renewable energy, agriculture, and beneficiation.
3. **Support beneficiation and smelter projects** where economically and environmentally feasible, positioning Gamagara as a value-adding node in global supply chains.
4. **Promote machinery and component manufacturing**, leveraging Kathu's concentration of suppliers to localise production and reduce import dependence.
5. **Facilitate circular economy industries**, including tyre granulation, tailings reprocessing, and industrial waste-to-value linkages.
6. **Strengthen agro-industrial integration**, enabling nut (pistachio and pecan nut) processing, biochar production, and other agricultural-industrial facilities.
7. **Promote industrial clustering** along the N14 corridor at Kathu (Bestwood) and Olifantshoek (secondary, supporting node).
8. **Facilitate SMME access** to industrial space and supplier opportunities, supported by incubation and training partnerships.
9. **Align training institutions (SIVOS, NCR TVET, Sol Plaatje University)** with skills needed for beneficiation, machinery, manufacturing, and industrial innovation.

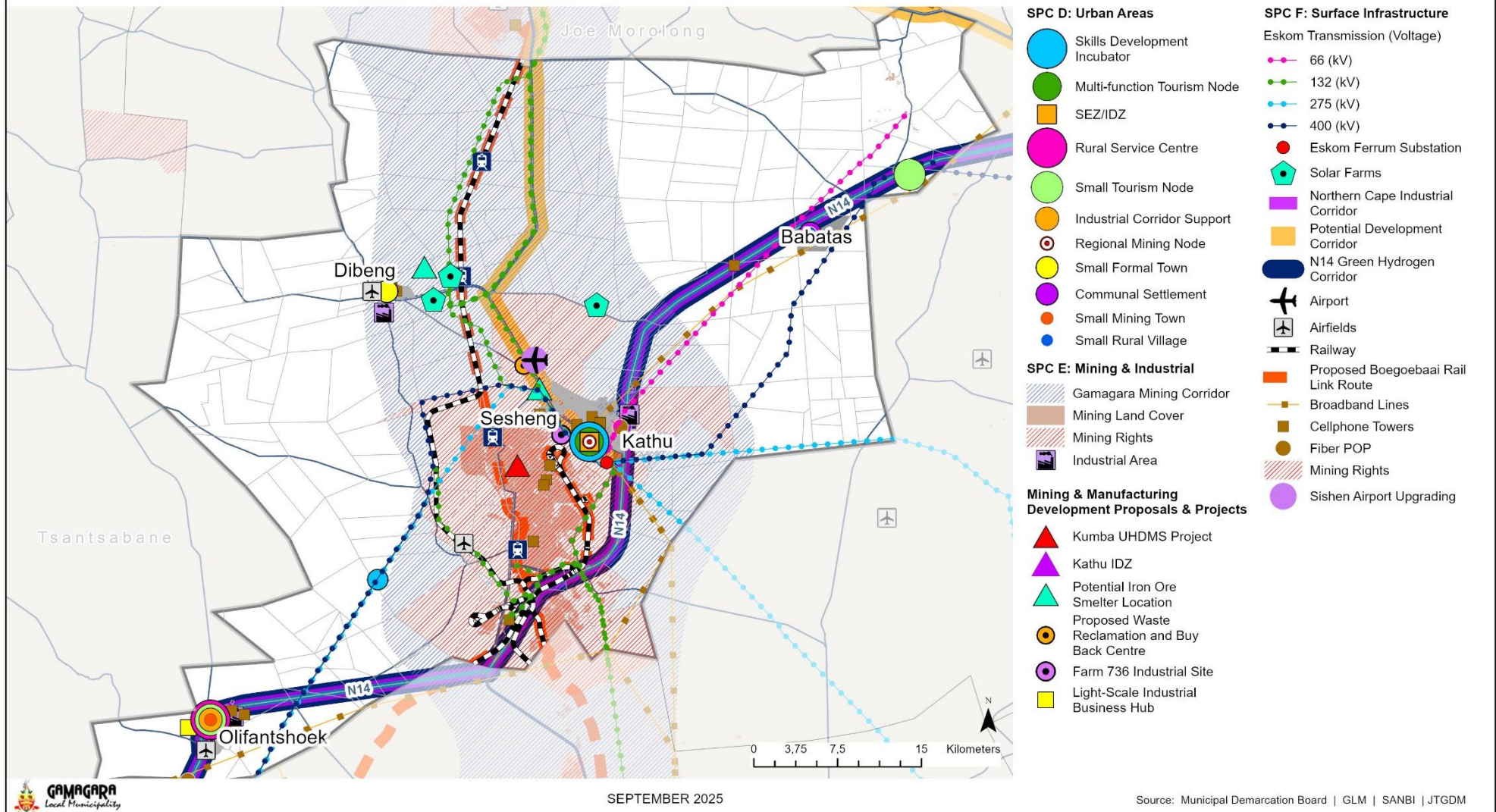
10.5 Conclusion

Mining and manufacturing together form the cornerstone of Gamagara's economic transition. While mining remains central to the present economy, the build-out of a diversified and future-fit manufacturing base will determine the municipality's long-term resilience. These two sectors, working in tandem, can sustain current strengths while laying the foundations for post-mining transformation.

The R380 Industrial Complex — comprising the Kathu Extension 2 industrial area, the Kathu Industrial Park, and the Farm 736 Industrial Development — together with the Bestwood Industrial Development on the N14 corridor, will serve as the anchors of this transition. Supported by beneficiation projects, SMME hubs, circular economy niches, agro-industrial processing, and renewable-linked manufacturing, these clusters will not only mitigate closure risks but also create sustainable jobs, attract investment, and embed Gamagara within regional and broader industrial value chains.

GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

MAP 6: Mining and Manufacturing Framework Development Plan



11. Wholesale & Retail Trade Framework Development Plan

11.1 Introduction

Wholesale and retail trade is a key enabler of economic diversification and inclusive growth in Gamagara. The sector provides direct employment opportunities, supports SMMEs, links producers to consumers, and underpins the viability of town centres. The Gamagara LED Strategy identifies wholesale and retail as one of the six strategic sectors for expansion, with strong alignment to population growth, infrastructure investment, and diversification across agriculture, tourism, mining, and manufacturing.

Gamagara already exhibits strong retail performance. Kathu hosts four shopping centres with a combined gross leasable area (GLA) of 55,875 m², serving as a regional retail destination for neighbouring municipalities. This strength is underpinned by high employment levels, the highest average taxable incomes in South Africa, and consequently significant disposable income and household expenditure, further bolstered by the large weekly influx of contractors, consultants, and mining-related business travel. Looking ahead, large-scale housing projects such as the Kathu 5700 mixed housing development will expand the resident base, reduce economic leakage caused by workers living in neighbouring municipalities, and further increase the scope for retail development and consumer spending.

11.2 Spatial Context

The main retail and wholesale activity is concentrated in Kathu, which functions as the regional service hub and retail destination. Kathu's CBD and four shopping centres together provide 55,875 m² GLA, hosting major national chains and service providers.

Despite this strength, Kathu faces a critical shortcoming in that it currently has no new vehicle dealerships with associated servicing centres. Only one dealership specialising in pre-owned vehicles is present. This gap results in significant economic leakage, as residents must travel to neighbouring municipalities to purchase or service vehicles under warranty or requiring specialised equipment and trained artisans. For older vehicles, servicing is often carried out by backyard mechanics

operating from residential areas, inconsistent with zoning provisions in the current land use management scheme.

Olifantshoek and Dibeng are experiencing population growth but remain distant second-level retail nodes, with only the most rudimentary retail offerings. Their limited retail footprint has resulted in the proliferation of informal spaza shops, which fill gaps in convenience trade but operate largely outside formal regulation. Township areas in Olifantshoek, Dibeng, Babatas, and Sesheng similarly host informal and unregistered businesses. In places such as Sisheng and Mapoteng, zoning provisions are highly accommodative, allowing multiple and often conflicting land uses. This contributes to the unchecked growth of spaza shops, which may pose health and safety risks due to unregulated operations.

The N14 corridor remains the municipality's main economic artery, linking Kathu to Postmasburg, Kuruman, and Upington, and supporting corridor-based retail and logistics opportunities. The Bestwood Industrial Development, strategically located on the N14, provides a suitable location for large-box retail, new vehicle dealerships, and associated servicing facilities, ensuring visibility, accessibility, and integration with the region's dominant trade corridor.

11.3 Key Opportunities and Considerations

The first opportunity is to consolidate and diversify Kathu as the regional retail hub, anchored by the implementation of the Kathu CBD Precinct Plan (2025). This includes CBD renewal, pedestrian accessibility improvements, parking upgrades, and development of mixed-use corridors along the N14.

The second opportunity is to strengthen secondary nodes in Olifantshoek and Dibeng, while addressing their limited retail offerings. These towns require modest retail upgrades, but also interventions to manage and formalise spaza shops and prevent land use conflicts.

The third opportunity is to promote township and informal trade development, but in a way that is orderly and regulated. Spaza shops and other informal businesses must be registered with the municipality, subject to health and safety controls, and supported with dedicated trading spaces and small retail parks.

The fourth opportunity is to integrate wholesale and retail with other sectors:

- ▶ Agriculture: local supply of nuts, fruit, vegetables, and processed products into local retail chains.
- ▶ Tourism: craft and food markets aligned with events and festivals.
- ▶ Manufacturing: distribution hubs for machinery, equipment, and parts.

The fifth opportunity is to expand highway and corridor trade. With the N14 as the main artery, opportunities include fuel stations, logistics services, rest stops, large-box retail, and — critically — new vehicle dealerships with associated servicing centres, particularly in or adjacent to the Bestwood Industrial Development.

The sixth opportunity is to leverage disposable incomes and population growth. High household expenditure, inflows of business travellers, and new mixed housing developments such as Kathu 5700 will grow the consumer base, reduce economic leakage, and increase demand for diverse retail offerings.

The Wholesale & Retail Trade Opportunity Matrix is presented in **Table 6** on the following page.

Spaza Shops and Land Use Management Reform

Context

With limited retail offerings in Olifantshoek and Dibeng, and permissive zoning in settlements such as Sesheng and Mapoteng, there has been a proliferation of spaza shops and unregistered small businesses across Gamagara. While these provide essential convenience goods, they often operate outside formal regulation, creating risks to consumer safety and undermining orderly urban form.

Key Issues

- ▶ **Health and safety risks:** Unregistered outlets may not meet regulatory standards.
- ▶ **Zoning conflicts:** Inconsistent Land Use Scheme provisions allow multiple and conflicting land uses.
- ▶ **Urban disorder:** Backyard businesses blur the distinction between living and trading spaces.
- ▶ **Economic informality:** Lack of registration prevents integration into local supply chains and municipal systems.

Strategic Opportunity

- ▶ **Formalise spaza shops** by requiring municipal registration and compliance with health and safety controls.
- ▶ **Reform the Land Use Management Scheme (LUMS)** to apply consistent zoning across all settlements.
- ▶ **Provide designated trading spaces** to accommodate small-scale traders and improve access to formal markets.
- ▶ **Link spaza shops into local value chains**, particularly food supply chains from community gardens and farms.

Potential Impacts

- Improved consumer safety and public health.
- Stronger, more orderly urban form.
- Increased municipal revenue through compliance.
- Greater inclusivity by supporting small traders to transition into formal networks.

TABLE 6: Wholesale & Retail Trade Opportunity Matrix

Opportunity Area	Key Assets	Proposed Projects/Initiatives	Potential Impacts
Kathu Hub	CBD, malls (55,875 m ² GLA), Kathu CBD Precinct Plan	Implement precinct plan; CBD renewal; mall expansions; mixed-use corridors	Strengthened regional hub; improved urban form; job creation
Olifantshoek Node	Newly demarcated CBD; N14 throughway	Develop CBD precinct plan; tree line; SMME stalls; signage upgrades	Improved attractiveness; small business growth; stronger local retail
Dibeng Node	Newly demarcated CBD; population growth	Develop CBD precinct plan; introduce shopping centre & mixed-use incl. housing	Diversified retail base; new jobs; enhanced service levels
Township & Informal Trade	Sesheng, Babatas, Olifantshoek, Dibeng	Registration of spaza shops; health & safety controls; formalised spaces	SMME support; reduced health risks; orderly development
Spaza & LUMS Reform	Current LUMS (inconsistent zoning across settlements)	Reform LUMS; consistent zoning; prohibit Residential IV; regulate small businesses	Safer urban form; reduced land use conflicts; improved planning control
Cross-Sector Integration	Agriculture, tourism, manufacturing	Food supply chains; craft markets; equipment distribution hubs	Value chain linkages; diversified markets
Highway & Corridor Trade	N14 corridor; Bestwood Industrial Development	Large-box retail; vehicle dealerships & servicing centres; logistics services; branded retail	Corridor-based growth; reduced leakage; enhanced service offering
Population & Housing Growth	Kathu 5700 housing, inward migration, regional shoppers	Expanded retail footprint; diverse retail offerings	Reduced leakage; greater household expenditure locally

11.4 Settlement-Level Considerations

11.4.1 Kathu

As the regional retail hub and service centre, Kathu already boasts four shopping centres with a combined GLA of 55,875 m², but it faces structural challenges that require targeted spatial interventions. The implementation of the Kathu CBD Precinct Plan (2025) will be central to consolidating the CBD as the municipality's economic and social heart, improving its functionality and attractiveness. Additional interventions are needed to diversify the retail footprint, strengthen wayfinding and entrances, and address the critical shortfall in vehicle dealerships and servicing centres, while planning for new neighbourhood convenience centres to support upcoming housing developments such as Kathu 5700.

1. **Implement the Kathu CBD Precinct Plan (2025)** to guide renewal, pedestrian accessibility, traffic circulation, and public spaces.
2. **Support expansion and diversification of malls and the CBD**, ensuring balanced growth in line with demand.
3. **Improve town entrances and wayfinding**, reinforcing Kathu's role as a regional retail destination.
4. **Address the dealership and servicing centre gap**, prioritising sites along the N14 corridor and at Bestwood.
5. **Plan for new neighbourhood convenience centres** to support large housing projects (e.g. Kathu 5700 and Mapoteng).

11.4.2 Olifantshoek

Although Olifantshoek is experiencing population growth, it remains a rudimentary, second-tier retail node with limited services and infrastructure. Focused interventions are required to enhance its CBD, improve urban functionality and quality, and support small business initiatives so that it can better meet local needs and capture opportunities from its position along the N14 corridor.

1. **Develop a precinct plan for the newly demarcated CBD.**
2. **Introduce a tree line along the N14 thoroughway in the CBD** to improve attractiveness and walkability.
3. **Improve solid waste collection and waste picking efforts** within the CBD's main street.

4. **Support initiatives for SMME stalls in the Olifantshoek CBD**, enhancing character and local business.
5. **Rehabilitate and improve town entrances and signage**, supporting local retail and service functions.
6. **Plan for new neighbourhood convenience centres** to support new township development, upgrading and formalisation projects (e.g. Welgelee, Diepkloof and Skerpdraai).

11.4.3 Dibeng

Dibeng's retail footprint is extremely limited and does not match its growing population base. As the town's new CBD has been demarcated, there is an opportunity to structure and diversify retail provision through precinct planning, the introduction of a formal small neighbourhood shopping centre, and mixed-use development that integrates higher-density housing and retail, thereby improving service levels and generating new employment opportunities.

1. **Develop a precinct plan for the newly demarcated CBD.**
2. **Introduce a shopping centre and other mixed-use developments** — inclusive of higher-density housing — into the CBD, diversifying shopping options and bolstering employment.

11.5 Spatial Guidance and Directives

To consolidate Gamagara's role as a regional service hub, wholesale and retail trade must be spatially directed in a way that strengthens town centres, promotes corridor development, and supports inclusive local participation.

1. **Implement the Kathu CBD Precinct Plan**, ensuring retail expansion is anchored in coordinated urban renewal that improves accessibility, urban design, visitor appeal, and investment attractiveness.
2. **Prioritise Kathu CBD and mall precincts** for further expansion and diversification into mixed-use corridors.
3. **Attract new vehicle dealerships with servicing centres** to the N14 corridor and Bestwood node, closing a structural service gap, reducing economic leakage, and creating formal jobs.
4. **Upgrade Olifantshoek and Dibeng retail offerings**, guided by new precinct plans, while recognising their role as limited, second-tier retail nodes.

5. **Formalise township trade**, requiring spaza shops and informal businesses to **register with the municipality** and comply with **health and safety controls**.
6. **Review and reform the Land Use Management Scheme (LUMS)** to:
 - ▶ Apply **consistent zoning arrangements across all settlements** (including Sesheng and Mapoteng).
 - ▶ Explicitly **accommodate vehicle dealerships and servicing centres**.
 - ▶ Prevent conflicting land uses and regulate small-scale businesses appropriately.
 - ▶ **Prohibit new Residential IV zoning**, which encourages informal business proliferation.
7. **Provide designated trading spaces** in townships to absorb and regulate informal trade, supporting small businesses to transition into the formal economy.
8. **Integrate agricultural supply chains** with local retail, linking food gardens and orchards to local restaurants, shops, and supermarkets.
9. **Promote corridor-based trade along the N14**, supporting large-box retail, dealerships, logistics services, and branded retail developments.
10. **Strengthen wayfinding and town entrances**, improving the attractiveness of towns to visitors, investors, and passing trade.
11. **Plan retail provision alongside housing growth**, ensuring new residential projects such as Kathu 5700 are supported by sufficient commercial and retail amenities.
12. **Exercise caution when reviewing applications for new shopping centres** larger than neighbourhood-scale convenience centres in Kathu within the next five years. Require an **urban economic retail assessment study** to accompany such applications, to avoid oversupply of retail space in the short- to medium-term.
13. **Encourage the development of regional warehousing and logistics facilities** to support wholesale and retail trade. These should include **modern warehousing capacity and electric vehicle (EV) charging stations**, positioning Gamagara as a forward-looking logistics hub.

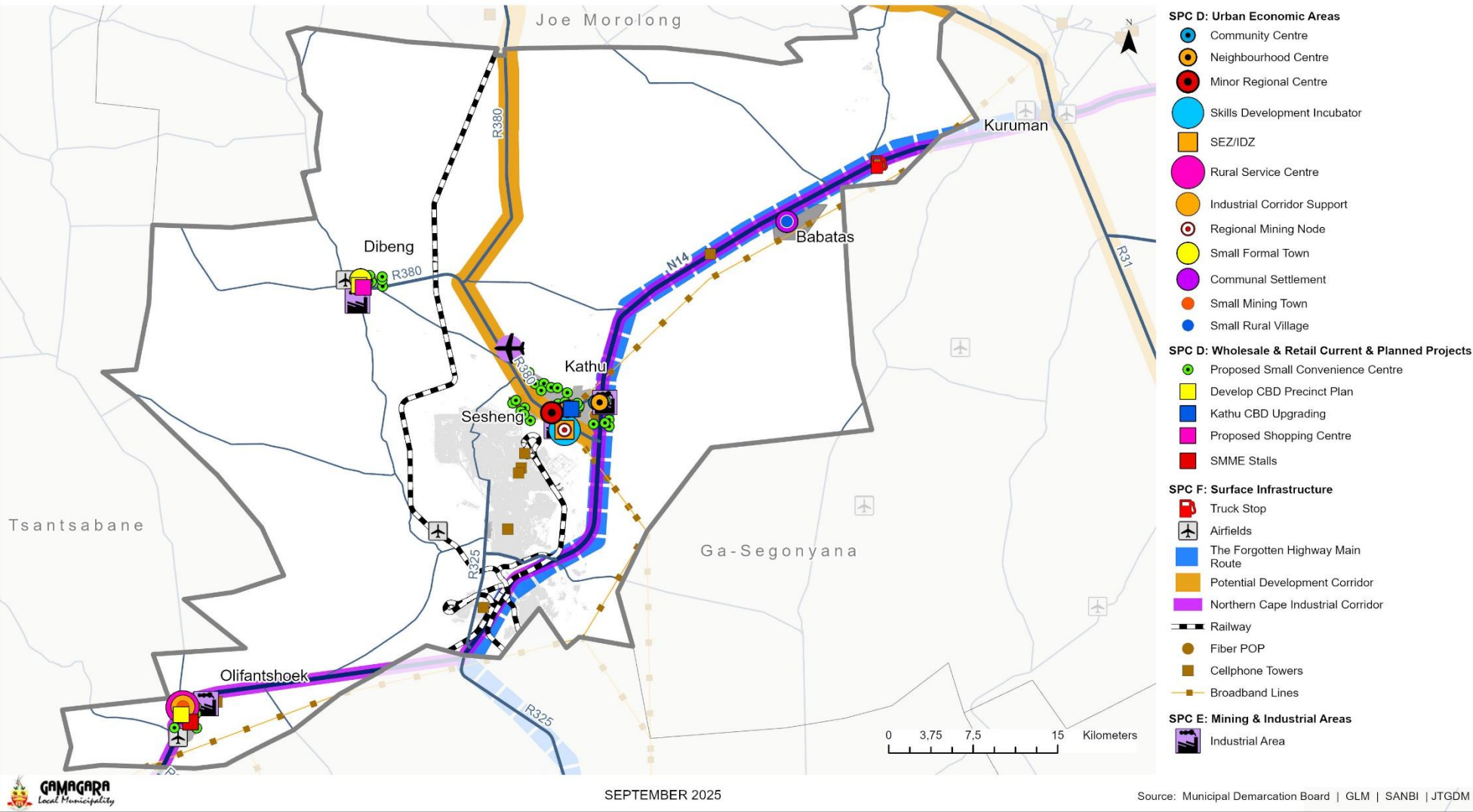
structural gap in vehicle dealerships and servicing centres, strengthening Olifantshoek and Dibeng through targeted precinct plans, and formalising township trade, Gamagara can expand access to goods and services, grow employment, and deepen linkages with agriculture, tourism, and manufacturing.

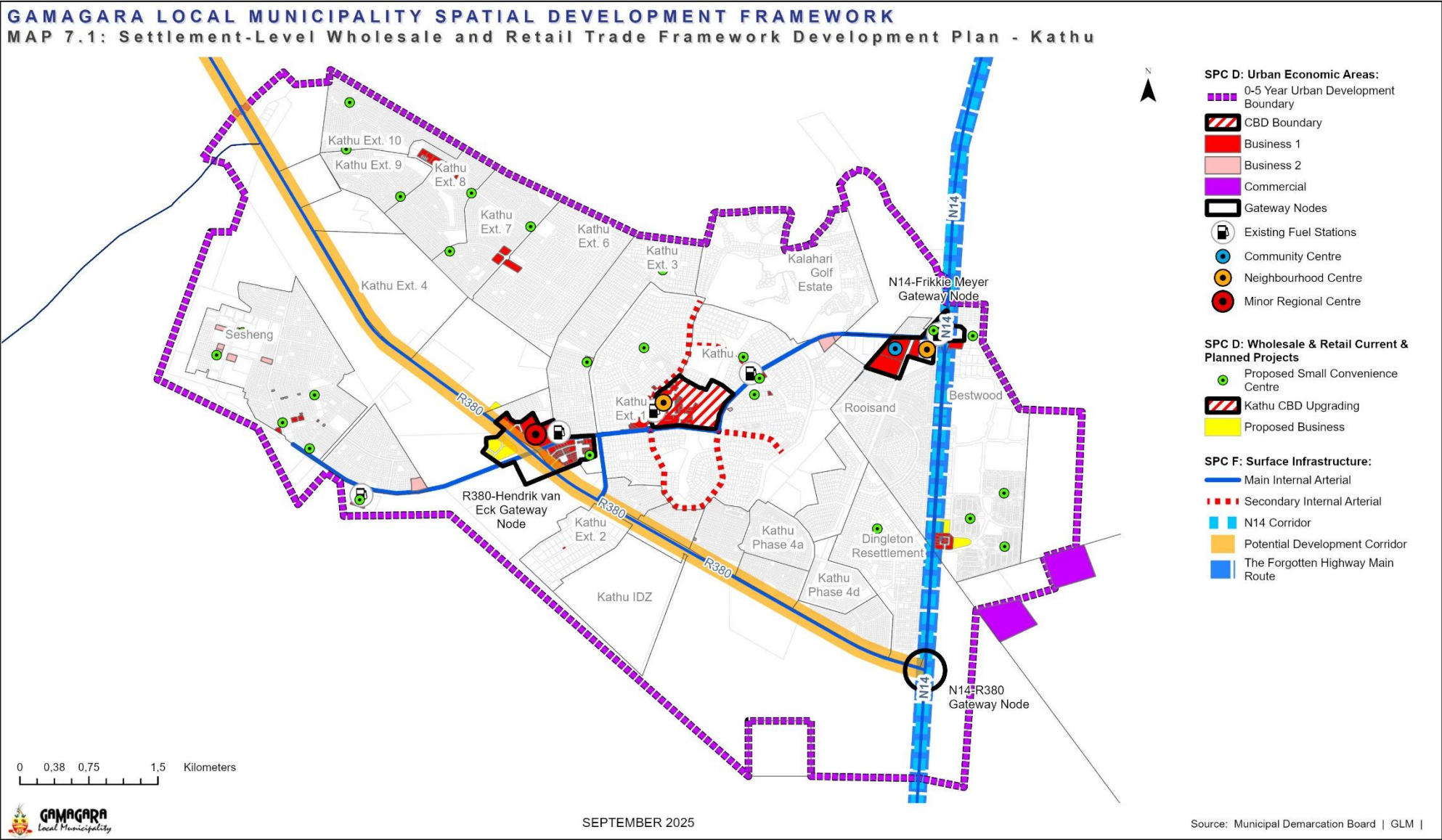
The sector's growth will be driven by high disposable incomes, sustained inflows of mining-related business travel, and large-scale housing developments that expand the consumer base and reverse economic leakage. Reforming the Land Use Management Scheme to ensure consistency across settlements, while requiring the registration and regulation of spaza shops, will further strengthen orderly urban form and sustainable retail development. With these measures, wholesale and retail trade will not only improve local quality of life but also reinforce Gamagara's position as the regional service and trade hub of the Gamagara Mining Corridor.

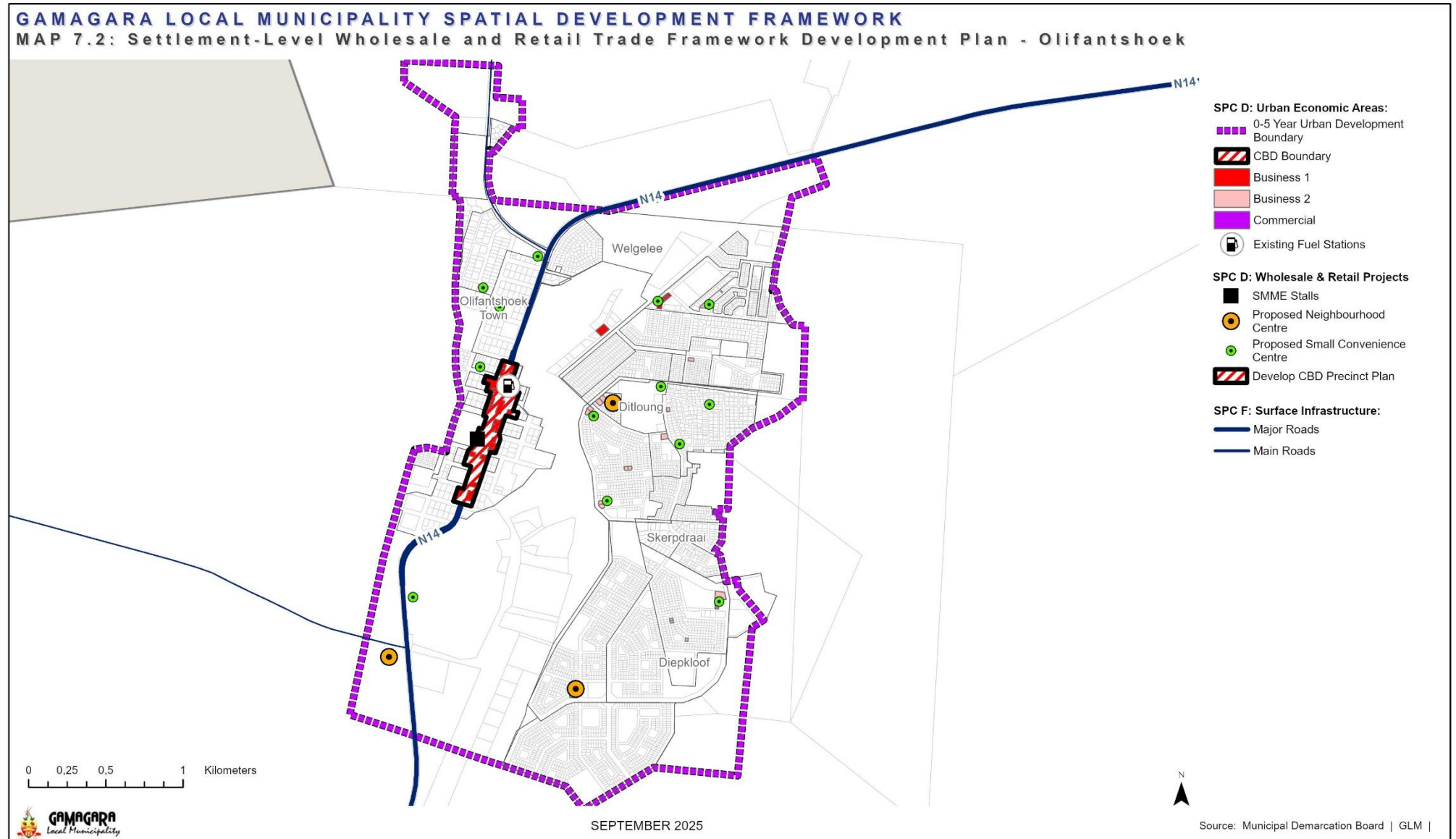
11.6 Conclusion

Wholesale and retail trade is a dynamic and inclusive sector that underpins Gamagara's broader economic diversification strategy. By consolidating Kathu's role as the regional retail hub, implementing the Kathu CBD Precinct Plan, addressing the

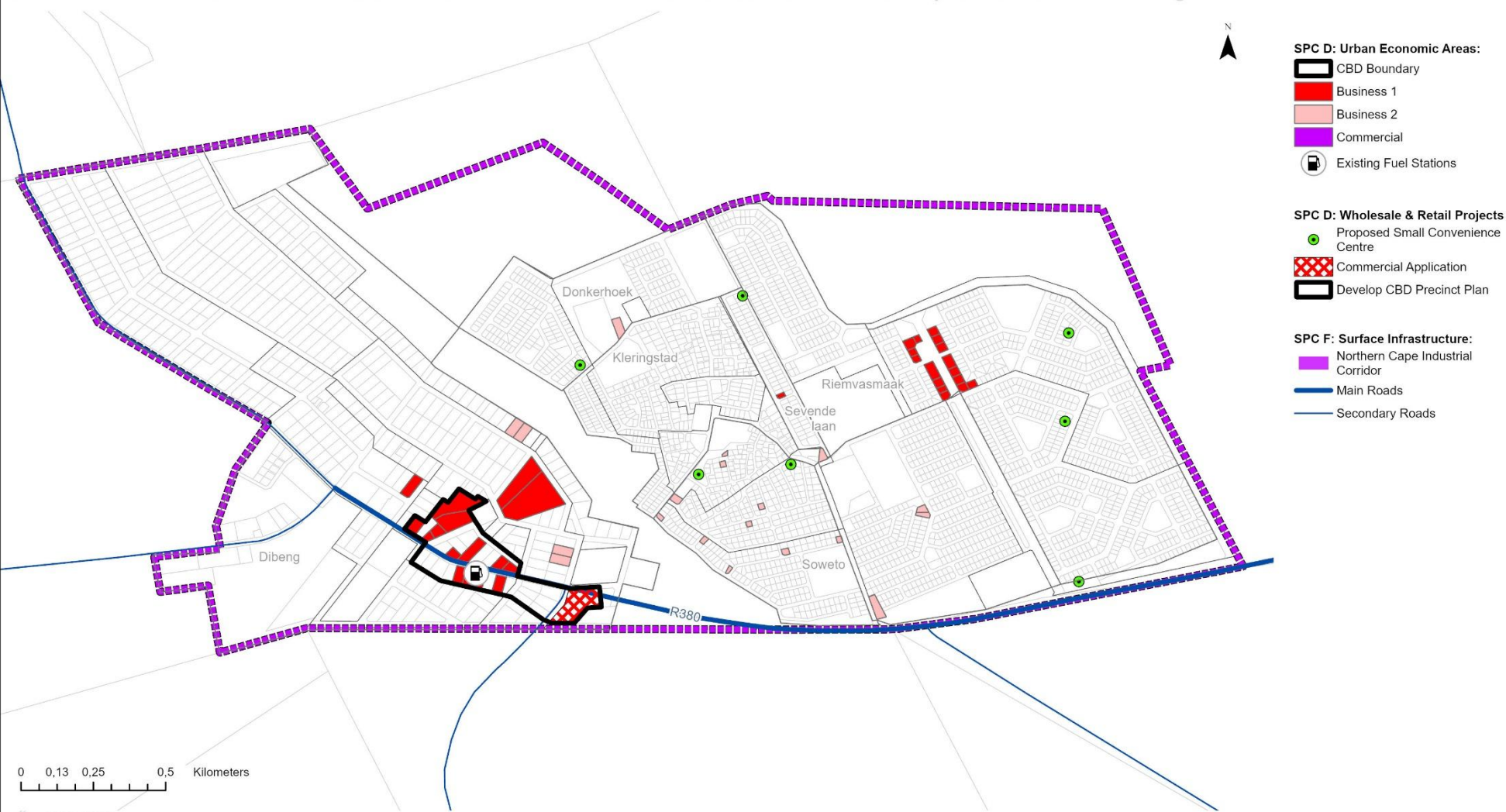
GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK
MAP 7: Wholesale and Retail Trade Framework Development Plan







GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK
MAP 7.3: Settlement-Level Wholesale and Retail Trade Framework Development Plan - Dibeng



12. Education, Training and Finance Framework Development Plan

12.1 Introduction

To remain future-fit, innovative, and economically competitive, Gamagara must build a skills pipeline that supports economic diversification, preparing both current and future generations for employment in new growth sectors. With mining operations expected to scale down over the coming decades, the municipality faces the dual challenge of reskilling the existing workforce while equipping school learners and youth with skills aligned to the emerging economy.

The Gamagara LED Strategy emphasises education and training as critical enablers, alongside finance and enterprise support. This extends beyond conventional schooling to include, amongst other, training in innovative agricultural techniques, and exposure to circular economy and renewable energy practices.

At the same time, access to finance is essential for business development, especially for SMMEs and entrepreneurs. A coordinated training and finance framework will ensure that residents and enterprises can seize opportunities in new growth sectors, reinforcing the municipality's broader diversification agenda.

12.2 Spatial Context

The context for training and finance in Gamagara is shaped by the impending mine closures, which, if not mitigated, will lead to large-scale job losses across the municipality and the wider region. The Early-Stage Post-Mining Economic Growth and Diversification Strategy identifies six sectors with the potential not only to counter mining-related job losses but also to drive net new job creation.

However, for the local labour force to benefit, a future-oriented skills pipeline must be developed, and the existing workforce must be reskilled. Without this, there is a real risk that employment in new sectors will be captured by in-migrating skilled workers from other regions, leaving the current workforce without pathways to benefit from local economic transformation or to seize opportunities elsewhere.

Within this unfolding context, Kathu is ideally placed to function as a regional skills incubator, acting as the nexus where several enabling factors converge:

1. **Large employers** in both the current strong economic sectors and emerging growth sectors.
2. A **strong education system**, with both public and private schools serving primary and secondary learners, complemented by adult work-focused training facilities such as **SIVOS** and the **NCR TVET College (Kathu Campus)**. This is further reinforced by **supporting sports infrastructure and learner amenities**, which complement formal education and foster holistic youth development.
3. **Innovations, technologies, pilot projects, and processes** being introduced across the municipality — from renewable energy to advanced farming systems and circular economy practices.
4. **Opportunities to couple education with nearby work and experiential learning**, through apprenticeships, learnerships, and on-site exposure in priority sectors.

New technologies and processes being implemented in Gamagara — including hydroponics, wind tunnel farming, new crop types, renewable energy systems, and circular economy practices — lend themselves to the establishment of research and experiential facilities near where these activities occur, reinforcing the municipality's role as a skills and innovation hub.

The combination of these assets naturally positions Kathu as a regional skills development hub, capable of linking education, innovation, and industry. At the same time, economic modelling shows that the size of the future skilled workforce required will exceed the local population's capacity, making a regional approach to education infrastructure and skills development essential. This requires strong partnerships with surrounding towns and municipalities, as well as with provincial and sector departments, to ensure that capacity is built in a balanced and coordinated manner that benefits the broader region.

Finance support must follow the same spatial logic: clustering in Kathu as the primary service hub, while ensuring that Dibeng, Olifantshoek, and rural communities gain access to financial services, microfinance, and enterprise support platforms to underpin inclusive development.

12.3 Key Opportunities and Considerations

The opportunities for training and finance build on Kathu's strengths as a regional hub while ensuring equitable outreach and coordinated development across the region. The first opportunity is to align training provision with post-mining growth sectors, ensuring that reskilling, upskilling, and youth training pipelines prepare the workforce

for renewable energy, circular economy, agro-processing, tourism, logistics, and advanced manufacturing.

The second opportunity is to leverage existing institutions such as SIVOS, NCR TVET, and new schools in Kathu and Dibeng, while partnering with universities and research bodies to establish Gamagara as a skills and innovation hub.

The third opportunity is to develop smart education hubs, ensuring coordinated programming between Kathu, Kuruman, and Postmasburg, with Kathu anchoring the hub in renewable energy, advanced manufacturing, and mining services.

The fourth opportunity is to integrate training with sectoral development projects:

- ▶ Agricultural projects (e.g. wind tunnel farming, pistachio/pecan orchards, biochar).
- ▶ Renewable energy (workforce for plant construction, O&M, and recycling).
- ▶ Manufacturing (eco-industrial parks, green technologies).
- ▶ Tourism (hospitality, event management, guiding).
- ▶ Conservation (environmental education in nature reserves).

The fifth opportunity is to expand financial inclusion and enterprise development support, especially for SMMEs, women- and youth-owned businesses. This includes partnerships with DFIs (IDC, SEFA), commercial banks, and NGOs and agencies already active in Gamagara, which provide youth development, enterprise support, and mentorship.

The sixth opportunity is to use the Regional Compact as a platform to coordinate training and finance strategies, align priorities with closure plans, and co-invest in regional education infrastructure.

The seventh opportunity is to leverage Gamagara's strengths as the area of highest employment growth, ensuring training is integrated with workplace-based learning (learnerships, apprenticeships, in-employment reskilling), while complementing the role of Kuruman and Postmasburg in a balanced regional system.

The Education, Training and Finance Opportunity Matrix is presented in **Table 7**.

12.4 Settlement-Level Considerations

12.4.1 Kathu

Kathu is the primary training and finance hub of Gamagara and the wider Spatial Action Area. It combines a concentration of employers in mining, renewable energy, and manufacturing with a strong base of educational and training institutions, including SIVOS, the NCR TVET College, private training providers, and new schools in the planning phase. Complementary sports infrastructure and learner amenities further support youth development. As the location of most future employment opportunities, Kathu is where training and finance systems must be anchored, while also ensuring regional coordination.

1. **Support implementation of planned new schools** to expand education capacity.
2. **Strengthen partnerships with SIVOS, NCR TVET, and private academies**, aligning training with sectoral priorities.
3. **Link education with workplace opportunities**, embedding apprenticeships, learnerships, and internships.
4. **Establish innovation and research facilities** linked to emerging technologies and pilot projects (e.g., renewable energy, advanced agriculture, circular economy).
5. **Anchor municipal enterprise and finance support services** in Kathu, ensuring coordination with regional nodes.

12.4.2 Olifantshoek

Olifantshoek remains a **second-tier settlement** but requires strengthened access to education, training, and finance services to support community development and resilience.

1. **Expand access to training programmes** through mobile and satellite initiatives linked to Kathu.
2. **Strengthen financial literacy and microfinance outreach**, enabling small businesses and households to benefit from diversification.
3. **Integrate youth development programmes with NGOs and agencies** active in the municipality, ensuring Olifantshoek's residents are connected to wider support networks.

TABLE 7: EDUCATION, TRAINING AND FINANCE OPPORTUNITY MATRIX

Opportunity Area	Key Assets/Partnerships	Proposed Initiatives	Potential Impacts
Skills for Growth Sectors	SIVOS, NCR TVET, new schools, SPU partnerships	Reskilling in renewable energy, manufacturing, agro-processing, circular economy, tourism	Labour absorption, reduced closure shocks
Smart Education Hubs	Kathu hub, Kuruman, Postmasburg	Anchor Kathu hub; coordinate with Kuruman & Postmasburg hubs	Regional skills pipeline; equitable access
Sector-linked Training	LED projects, MSDF proposals	Renewable O&M training; tourism & hospitality skills; conservation programmes	Integrated sectoral growth
Finance Access	DFIs, banks, NGOs, SLP/SED collaboration	Enterprise finance platform; microfinance for SMMEs; blended finance	Expanded entrepreneurship; inclusive growth
Regional Compact	Office of the Premier, municipalities, sector departments, mines, renewable energy producers	Platform to align training/finance strategies; co-invest in regional education facilities	Coherent investment; long-term sustainability
Innovation & Research	Universities, reserves, research bodies	Applied research; experiential learning facilities linked to new technologies	Knowledge economy; innovation culture

12.4.3 Dibeng

Dibeng is experiencing population growth and will host one of the new planned schools, positioning it to play an important supporting role in the education system. Its proximity to renewable energy investments also makes it a suitable location for outreach programmes in energy and environmental training.

1. **Implement the planned new Dibeng primary school.**
2. **Introduce satellite training and finance programmes**, building links with Kathu's hub.
3. **Leverage renewable energy investments near Dibeng** to develop sector-specific training opportunities.

12.4.4 Rural Areas and Communities

Smaller settlements and farming areas require targeted outreach to ensure they are not excluded from training and finance initiatives.

1. **Develop mobile training units** to deliver short courses, literacy programmes, and sector-linked skills in rural areas.
2. **Expand access to microfinance and enterprise support** through community-based platforms and digital tools.
3. **Leverage conservation areas (Bredendam and Brooks reserves)** as sites for environmental education and skills development.

12.5 Spatial Guidance and Directives

The spatial guidance and directives outline how training and finance interventions should be structured spatially to ensure equitable access, integration with growth sectors, and coordination with regional partners.

1. **Anchor Kathu as the regional smart education hub**, with a focus on renewable energy, advanced manufacturing, and mining-linked reskilling.
2. **Ensure Dibeng and Olifantshoek gain access to training and finance services**, with satellite programmes and outreach facilities to support inclusivity.
3. **Support development of new schools in Kathu and Dibeng**, ensuring alignment with broader training and skills pipelines.

4. **Formalise partnerships with SIVOS, NCR TVET, Sol Plaatje University, and NGOs**, embedding experiential and applied research facilities in Gamagara.
5. **Require all major sectoral projects (renewable energy, agro-processing, eco-industrial parks) to include dedicated training and apprenticeship components.**
6. **Coordinate industry-linked SLP/SED strategies via the Regional Compact**, ensuring alignment of training and finance priorities, and development of shared regional education infrastructure.
7. **Create a municipal enterprise and finance support platform**, coordinating with DFIs, banks, NGOs, and mines to support SMMEs and entrepreneurs.
8. **Promote blended finance mechanisms**, using catalytic public and private investment to unlock larger pools of funding.
9. **Support community-level financial literacy and microfinance programmes**, improving household resilience and local enterprise participation.

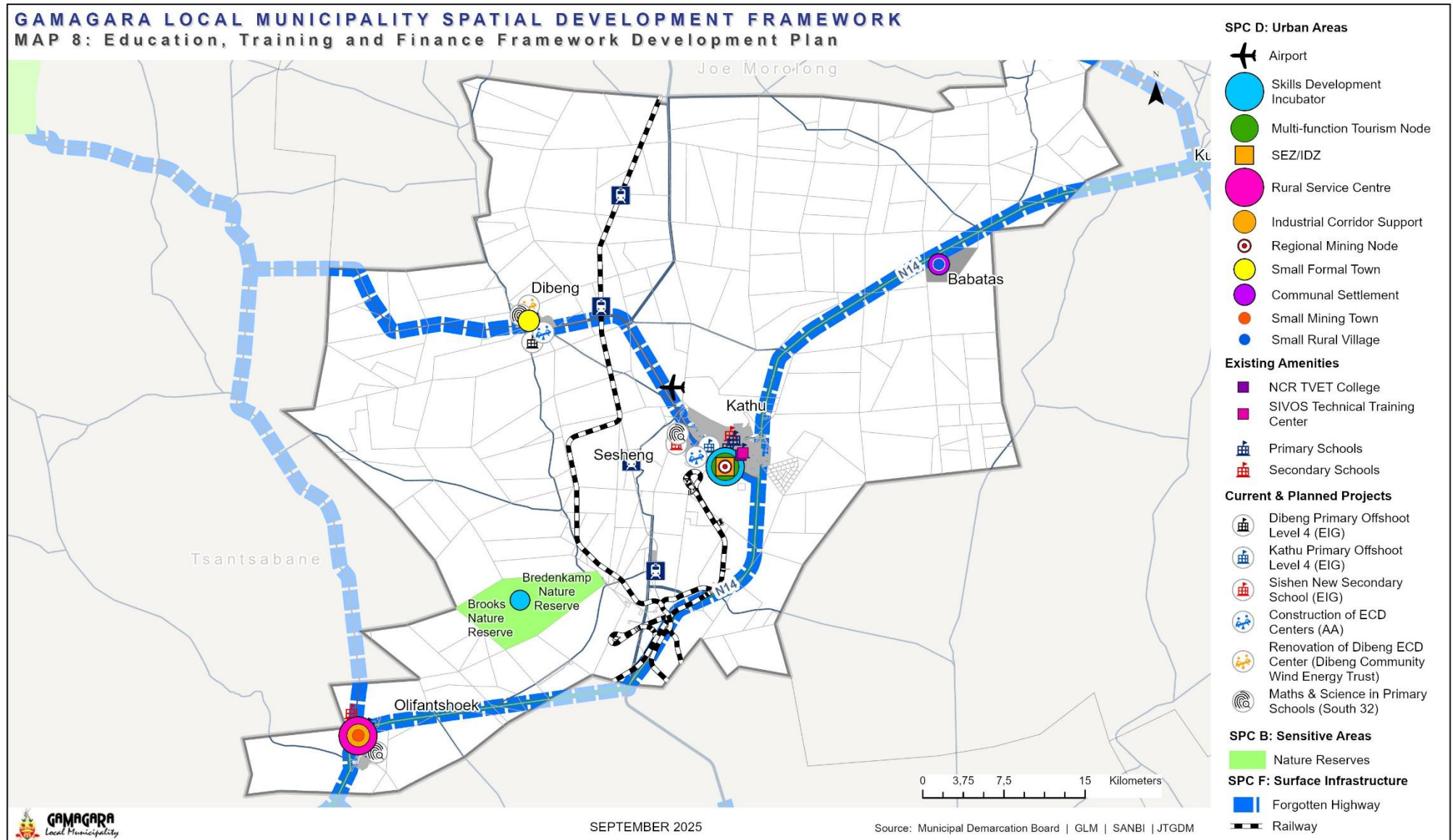
12.6 Conclusion

The Training and Finance Framework Development Plan positions Gamagara to become a skills and finance hub for the Gamagara Mining Corridor and Gamagara Spatial Action Area. By aligning training with strategic growth sectors, leveraging existing institutions, and embedding education hubs in Kathu, the municipality can ensure that both the youth and the existing workforce are prepared for a post-mining economy.

Kathu's concentration of employers, schools, training institutions, and supporting amenities makes it the natural anchor for skills development. At the same time, new technologies and processes being implemented in Gamagara — including hydroponics, wind tunnel farming, renewable energy systems, and circular economy practices — provide opportunities for experiential and research facilities located close to where these activities occur, reinforcing Gamagara's role as a skills and innovation hub.

Finance provision must follow the same logic: clustering in Kathu as the primary service hub while extending access to Dibeng, Olifantshoek, and rural communities through microfinance, enterprise support platforms, and outreach programmes. This ensures that no part of the municipality is excluded from the opportunities that diversification will create.

At the regional level, Gamagara must anchor training and finance provision while coordinating with Kuruman and Postmasburg to ensure balanced delivery of education and skills infrastructure. Coupled with inclusive finance mechanisms, strengthened enterprise support, and partnerships with mines, DFIs, universities, and NGOs, this framework provides the foundation for a more diversified, innovative, and resilient Gamagara economy — building not only a future-ready Gamagara, but also a future-ready region.



13. Composite Economic Framework Development Plan

13.1 Introduction

The Composite Economic Framework Development Plan brings together the six sectoral development frameworks — agriculture, tourism, renewable energy, mining and manufacturing, wholesale and retail trade, and education, training and finance — into a single, coherent system. Collectively, these frameworks position Gamagara to transition from a mining-dependent economy to a diversified, resilient, and future-fit economy that can sustain livelihoods and prosperity beyond the eventual closure of mining operations.

13.2 Spatial and Economic Context

This framework is forward-looking but firmly anchored in the realities of Gamagara and its regional context and informed by robust evidence. It capitalises on the municipality's current strengths and opportunities, directly addresses weaknesses, and confronts threats with pragmatic, actionable strategies. It recognises that Gamagara's future must be built on both its unique local assets and its position within the broader Northern Cape economy.

The municipality's spatial positioning in the North-Western Transformation Corridor and within the Gamagara Spatial Action Area (as per the Northern Cape PSDF) makes it a strategic anchor for economic transition. Its industrial platform, concentration of employers, skills base, and logistical assets (rail, airport, N14 corridor) equip Gamagara to serve as both a local growth hub and a contributor to regional transformation.

13.3 Key Cross-Sectoral Insights

The six sectoral frameworks are designed not as stand-alone strategies, but as mutually reinforcing components of a composite economy. Examples of synergies include:

- **Mining land remediation** creates opportunities for agricultural production, agro-processing, and biodiversity reserves.

- **Education and training pipelines** feed directly into renewable energy, manufacturing, agro-processing, and tourism.
- **Retail and wholesale hubs** (Bestwood, Kathu CBD) serve agricultural, manufacturing, and tourism supply chains while providing employment and services.
- **Tourism events** strengthen place identity and social capital, which in turn improves retail performance, attracts investment, and supports small business growth.

These linkages demonstrate that the framework is not fragmented, but a coherent and integrated economic system.

13.4 Policy Alignment

13.4.1 National Alignment

At the national level, the framework advances the National Spatial Development Framework (NSDF) and supports the objectives of the National Development Plan (NDP), the National Infrastructure Plan 2050, and the Just Energy Transition Investment Plan (JET-IP) by linking energy transition, diversification, and skills development to spatial planning.

13.4.2 Provincial Alignment

At the provincial level, the framework aligns with the Northern Cape PSDF by positioning Gamagara within the North-Western Transformation Corridor and the Gamagara Spatial Action Area, and by directly responding to the PSDF's identified drivers, elements, and strategic opportunities (see **Table 8 and Table 9** below).

13.4.3 District Alignment

At the district level, the framework supports the objectives of the John Taolo Gaetsewe District One Plan, the District SDF, and the IDP, ensuring coherence between municipal and district development agendas.

13.4.4 SPLUMA Alignment

The Composite Economic Framework Development Plan subscribes to and gives effect to the five development principles of SPLUMA (2013).

- ▶ **Spatial Justice:** Township upgrading and formalisation projects, communal food gardens, spaza shop registration, neighbourhood centres in upgrading projects, and education/finance outreach programmes ensure inclusion, especially for marginalised communities.
- ▶ **Spatial Sustainability:** Mining land reclamation, arid-adapted crops, invasive species valorisation (biochar), renewable energy rollout, and circular economy industries extend the productive life of land while reducing ecological footprints.
- ▶ **Spatial Efficiency:** Corridor clustering (Bestwood on the N14), the Kathu CBD Precinct Plan, evidence-based retail approvals, and hub-and-spoke education models maximise efficiency.
- ▶ **Spatial Resilience:** Diversification across six growth sectors, land-use constraints in floodline/dolomite areas, green infrastructure retrofits, and workforce reskilling build adaptive capacity.
- ▶ **Good Administration:** Policy alignment with NSDF/PSDF/One Plan, the Regional Compact as a coordination platform, LUMS reform, and civic partnerships (tree planting, clean-ups, stewardship) strengthen cooperative governance.

Through these actions, SPLUMA principles are operationalised in concrete, place-specific interventions that translate legislation into measurable spatial outcomes.

13.5 Linking GLM Economic Frameworks to PSDF Drivers

The Composite Economic Framework Development Plan has been carefully structured to respond to the Northern Cape Provincial Spatial Development Framework (PSDF) drivers. Below, the linkages to all four drivers are presented, showing both sector-specific contributions and areas where spatial proposals simultaneously advance multiple drivers.

13.5.1 Driver 1: Thriving Economic Engines

This driver emphasises the creation of a diverse, competitive, and high-performing economic base that can sustain long-term growth in the Northern Cape. The

Gamagara economic frameworks respond directly by building on existing strengths in mining and trade, while expanding into new engines of growth such as agriculture, renewable energy, tourism, and advanced manufacturing — all underpinned by infrastructure investment and supportive service platforms. **Table 8** demonstrates how the Gamagara economic framework development plans align with Driver 1.

- ▶ **Agriculture (Section 7):** Pistachio/pecan orchards, food gardens, agro-processing, and biochar create new value chains.
- ▶ **Tourism (Section 8):** Signature festivals, eco-tourism, and culinary circuits grow new visitor markets.
- ▶ **Renewable Energy (Section 9):** Solar energy plants, O&M, and recycling industries establish Gamagara as a renewable hub.
- ▶ **Mining & Manufacturing (Section 10):** Kathu Industrial Park, beneficiation, eco-industrial parks, and tyre granulation diversify the industrial base.
- ▶ **Wholesale & Retail (Section 11):** Retail hubs (Kathu CBD, Bestwood node) consolidate Gamagara's role as a regional service centre.
- ▶ **Education, Training & Finance (Section 12):** Skills pipelines and finance platforms prepare the workforce and entrepreneurs for growth sectors.

13.5.2 Driver 2: Transforming Spaces and Livelihoods

This driver focuses on reshaping settlement patterns and improving quality of life by upgrading townships, strengthening nodes, and integrating livelihoods with spatial opportunities. The Gamagara economic frameworks contribute by ensuring that new economic activities are spatially linked to settlements, that services and retail are accessible, and that township upgrading and food security are embedded in economic diversification.

- ▶ **Agriculture (Section 7):** Food gardens in each settlement and agro-processing facilities support livelihoods and integration.
- ▶ **Tourism (Section 8):** Town entrances, tree lines, and precinct upgrades (Olifantshoek, Dibeng) enhance liveability and identity.
- ▶ **Renewable Energy (Section 9):** Solar energy investments near Dibeng strengthen local settlement-economy linkages.
- ▶ **Mining & Manufacturing (Section 10):** Bestwood, Kathu Industrial Park and the Farm 736 Industrial Development locate jobs and industry close to settlements.

- ▶ **Wholesale & Retail (Section 11):** Neighbourhood centres support new housing projects (e.g. Kathu 5700); spaza shop regulation creates safer township economies.
- ▶ **Education, Training & Finance (Section 12):** New schools in Kathu and Dibeng, and outreach to Olifantshoek and rural areas, expand education and training access.

13.5.3 Driver 3: Conservation of Resource Production Areas

This driver centres on the protection, sustainable use, and climate resilience of natural and productive resources, recognising that long-term economic growth depends on ecological stability. The Gamagara economic frameworks integrate this principle by promoting arid-adapted crops, invasive species management, renewable energy, decarbonised industry, and urban greening — ensuring that economic development goes hand-in-hand with environmental stewardship.

- ▶ **Agriculture (Section 7):** Arid-adapted crops (pistachio, pecan), wind tunnel farming, and biochar production restore soil and water systems.
- ▶ **Tourism (Section 8):** Eco-tourism in reserves (Brooks, Bredendam) and urban greening enhance conservation-linked livelihoods.
- ▶ **Renewable Energy (Section 9):** Solar plants and planned recycling of PV panels support the transition to low-carbon energy.
- ▶ **Mining & Manufacturing (Section 10):** Eco-industrial parks, CBAM-compliant industries, and tyre granulation promote waste-to-value.
- ▶ **Wholesale & Retail (Section 11):** Town tree lines absorb carbon, improve air quality, and reduce heat stress.
- ▶ **Education, Training & Finance (Section 12):** Green skills training and conservation education build a climate-resilient workforce.

13.5.4 Driver 4: Effective Spatial Governance

This driver underscores the importance of cooperative governance, transparent decision-making, and effective land-use management to deliver spatial transformation. The Gamagara economic frameworks embed this through mechanisms such as the Mine–Municipal Compact, renewable energy forums, LUMS reform, and coordinated partnerships with DFIs, NGOs, and educational institutions, ensuring that governance structures are in place to implement and sustain transformation.

- ▶ **Agriculture (Section 7):** Land remediation and township upgrading integrated with agricultural use support orderly planning.
- ▶ **Tourism (Section 8):** Partnerships with tourism associations strengthen governance of events and attractions.
- ▶ **Renewable Energy (Section 9):** Forums with operators align corporate social investment with local priorities.
- ▶ **Mining & Manufacturing (Section 10):** The Regional Compact provides a platform for aligning SED and SLP priorities with LED strategy and MSDF.
- ▶ **Wholesale & Retail (Section 11):** LUMS reform ensures consistent zoning, regulates spaza shops, and introduces retail impact assessments.
- ▶ **Education, Training & Finance (Section 12):** Skills compacts with mines, DFIs, NGOs, and universities ensure coordinated investment in training and finance ecosystems.

13.5.5 Multi-Driver Synergies

While each economic framework responds to specific PSDF drivers, many interventions are inherently cross-cutting, simultaneously advancing more than one driver. These multi-driver synergies demonstrate the integrated nature of the Composite Economic Framework and ensure that interventions deliver maximum impact across economic, social, environmental, and governance dimensions.

Examples include:

- ▶ **Neighbourhood centres** → support inclusive livelihoods (Driver 2), localised trade (Driver 1), and reduced transport impacts (Driver 3).
- ▶ **Tree lines and town greening** → improve liveability (Driver 2), strengthen climate resilience (Driver 3), and enhance place identity (Driver 1).
- ▶ **Biochar production** → restores ecosystems (Driver 3), creates agricultural jobs (Driver 1), and links rural producers to urban supply chains (Driver 2).
- ▶ **Regional Compact** → strengthens cooperative governance (Driver 4), supports skills and finance pipelines (Driver 2), and enables diversification (Driver 1).
- ▶ **LUMS reform** → improves governance (Driver 4), enhances settlement quality (Driver 2), and reduces environmental conflicts (Driver 3).

TABLE 8: LINKING GLM ECONOMIC FRAMEWORKS TO PSDF DRIVER 1: THRIVING ECONOMIC ENGINES

PSDF Driver & Elements	Agriculture (Section 7)	Tourism (Section 8)	Renewable Energy (Section 9)	Mining & Manufacturing (Section 10)	Wholesale & Retail (Section 11)	Education, Training & Finance (Section 12)
Strengthened Agriculture & Agro-Processing	Pistachio/pecan orchards; community food gardens; agro-processing facility; biochar	Agri-tourism; culinary circuits	–	Agro-inputs linkages (biochar); agro-processing facility	Food retail linkages	Agri-tech training; finance support
Mining & Mineral Beneficiation	Mining land reclamation and repurposing for productive agricultural use	Industrial heritage tourism	–	Kathu mining hub; beneficiation; tyre granulation; eco-industrial parks	Supply-chain retail/logistics	Mining skills/reskilling; finance for SMMEs
Tourism Market Development	Culinary circuits; experiential farm	Signature events; eco- and energy tourism	Solar plant tours near Dibeng	Industrial tourism (mine tours, expos)	Hospitality services, retail integration	Skills for tourism/hospitality; event management
Development of the Energy Sector	–	Energy tourism	Solar generation; O&M; recycling industries	Renewable energy-linked manufacturing platforms	Logistics for renewable energy operators	Renewable energy workforce reskilling; enterprise finance
Capitalise on Manufacturing & Trade	Agro-processing; biochar industries	–	RE manufacturing/O&M	Kathu Industrial Park; Farm 736; Bestwood build-out, CBAM-compliant industry	Kathu CBD renewal, Bestwood node retail/logistics; dealerships	Advanced manufacturing skills pipelines; SMME finance
Competitive Infrastructure Development	Irrigation infrastructure	Tourism infrastructure; town entrances	Renewable energy plants; grid upgrades	Industrial platform (rail, airport, N14, R380)	EV charging & logistics facilities	New schools; Kathu hub; enterprise finance
Maritime Economy	–	–	–	Indirect: beneficiation/export via Saldanha	Indirect: logistics linkages	–

13.6 Composite Opportunity Matrix

The Composite Opportunity Matrix (see Table 9) brings together the most significant cross-cutting opportunities from the economic frameworks (Sections 7–12). It demonstrates how these opportunities are not isolated to one sector, but instead operate across multiple domains, reinforcing each other and simultaneously advancing more than one PSDF driver.

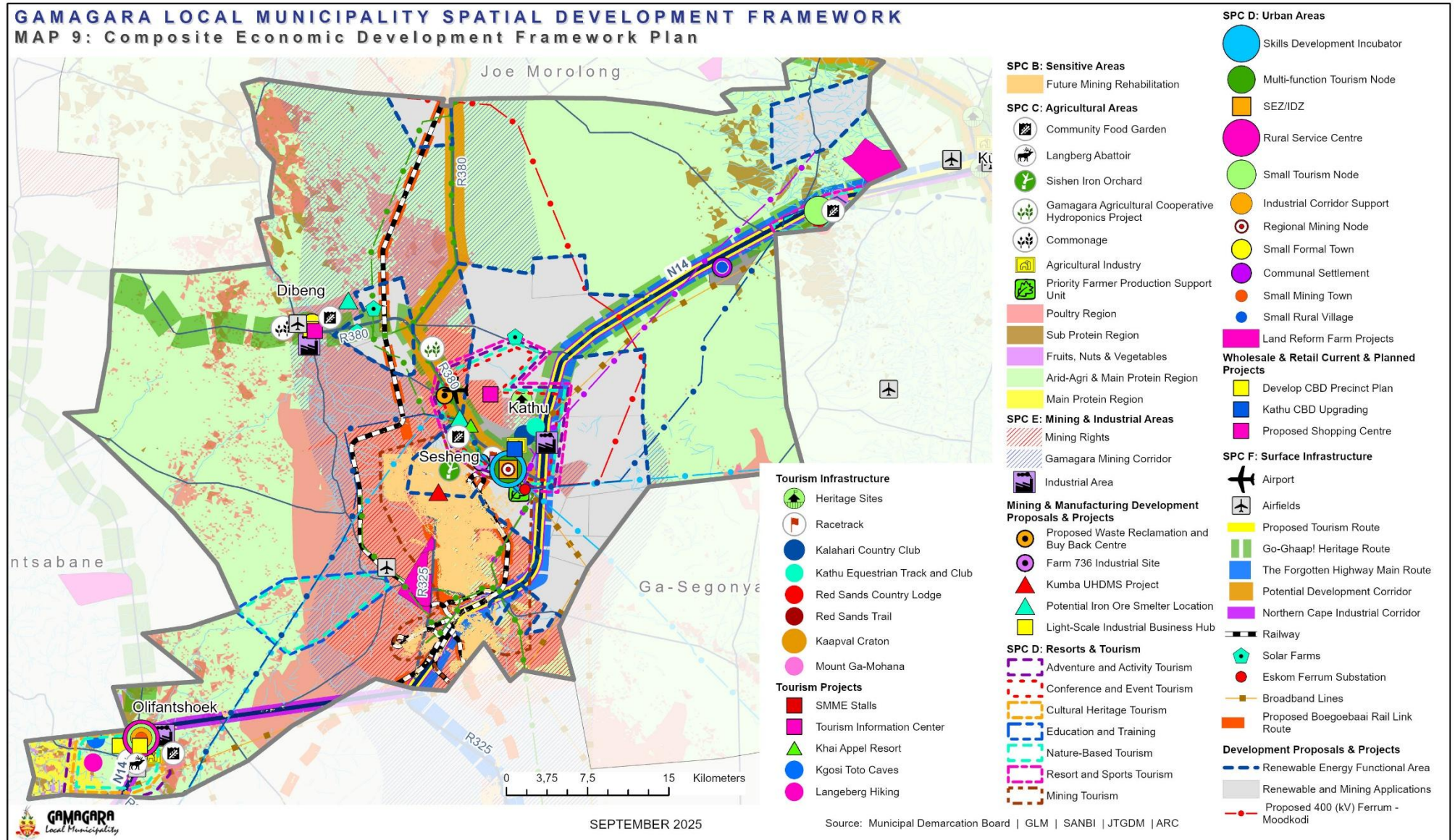
13.7 Conclusion

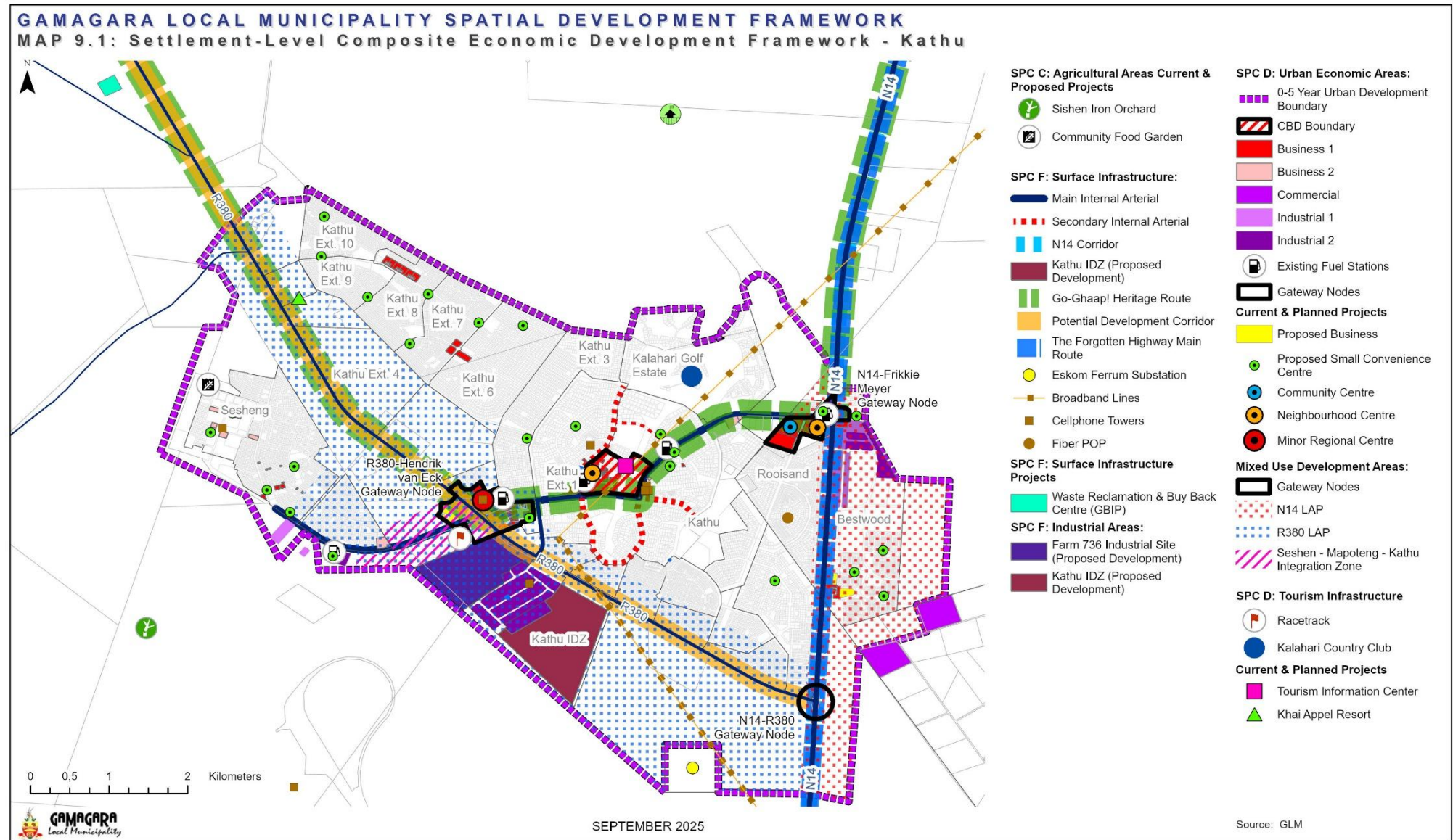
The Composite Economic Framework Development Plan underscores that Gamagara's future is not dependent on any single sector, but on the synergies between multiple sectors working in tandem. Agriculture, tourism, renewable energy, mining and manufacturing, wholesale and retail, and education, training and finance are each vital, but together they constitute a coherent, mutually reinforcing system.

By aligning with the drivers and strategic opportunities of the Northern Cape PSDF, advancing district and national policy priorities, and giving full effect to the principles of SPLUMA, the framework provides a spatially grounded, evidence-based roadmap for building a diversified, resilient, and future-ready Gamagara and region.

TABLE 9: COMPOSITE ECONOMIC OPPORTUNITY MATRIX

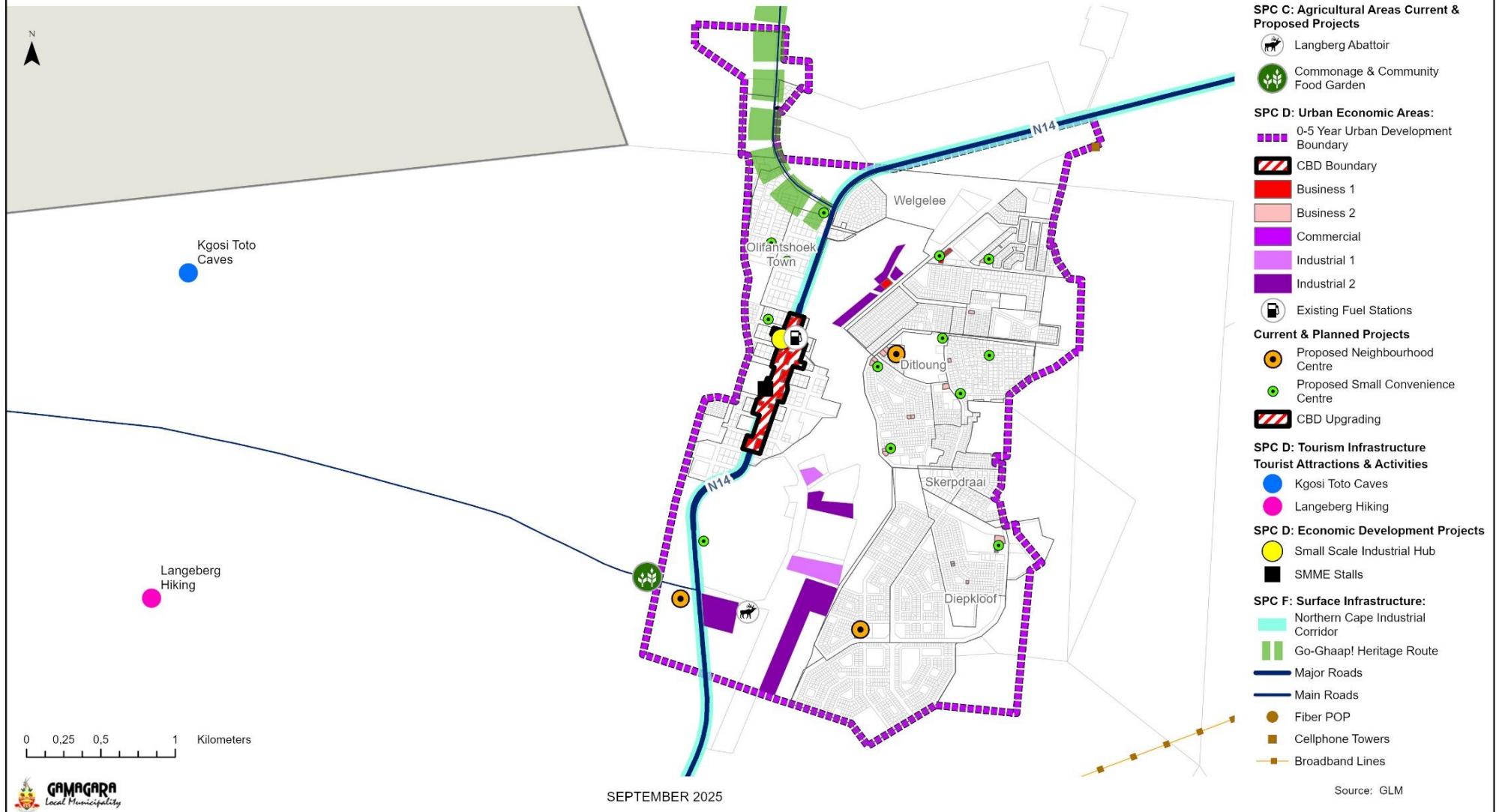
Opportunity Theme	Cross-Sectoral Contributions	Linked PSDF Drivers
Mining Land Reclamation & Remediation	Repurposing of end-of-life mining land for renewable energy (Section 9), agriculture (Section 7), biodiversity reserves (Section 4), and public amenities/tourism (Section 8).	Driver 1: Thriving Economic Engines (Mining, Energy, Agro-processing); Driver 2: Transforming Spaces & Livelihoods; Driver 3: Conservation of Resource Areas.
Arid-Region Agriculture & Biochar	Pistachio/pecan orchards, wind tunnel farming, community food gardens, experiential farms, biochar production from invasive Prosopis (Sections 7 & 10).	Driver 1: Thriving Economic Engines (Agri & Agro-processing); Driver 2: Livelihoods; Driver 3: Conservation & Climate Resilience.
Renewable Energy & Green Manufacturing	Solar plants and O&M services (Section 9); RE component manufacturing and recycling industries (Sections 9 & 10); RE tourism (Section 8).	Driver 1: Economic Engines (Energy, Manufacturing, Trade); Driver 2: Corridors & Livelihoods; Driver 3: Conservation & Sustainability.
Retail, Corridors & Town Centres	Kathu CBD Precinct Plan (Section 11); Bestwood N14 node (Section 11); neighbourhood centres linked to new housing (Section 11); town entrances and wayfinding (Sections 8 & 11).	Driver 1: Economic Engines (Manufacturing & Trade, Infrastructure); Driver 2: Livelihoods & Settlement Upgrading; Driver 4: Effective Spatial Governance.
Education, Training & Finance Ecosystem	Kathu as a regional hub (Sections 12); new schools in Kathu & Dibeng (Section 12); outreach to Olifantshoek/rural areas; Mine–Municipal Compact as coordination platform (Sections 10 & 12).	Driver 1: Economic Engines (Skills for all sectors); Driver 2: Transforming Livelihoods; Driver 4: Governance & Cooperative Platforms.
Tourism & Place-Making	Festivals and expos (Section. 8); eco-tourism in reserves (Section 8); town greening and tree lines (Sections 4, 8, 11).	Driver 1: Economic Engines (Tourism Development); Driver 2: Livelihoods & Settlement Upgrading; Driver 3: Conservation & Resource Protection.



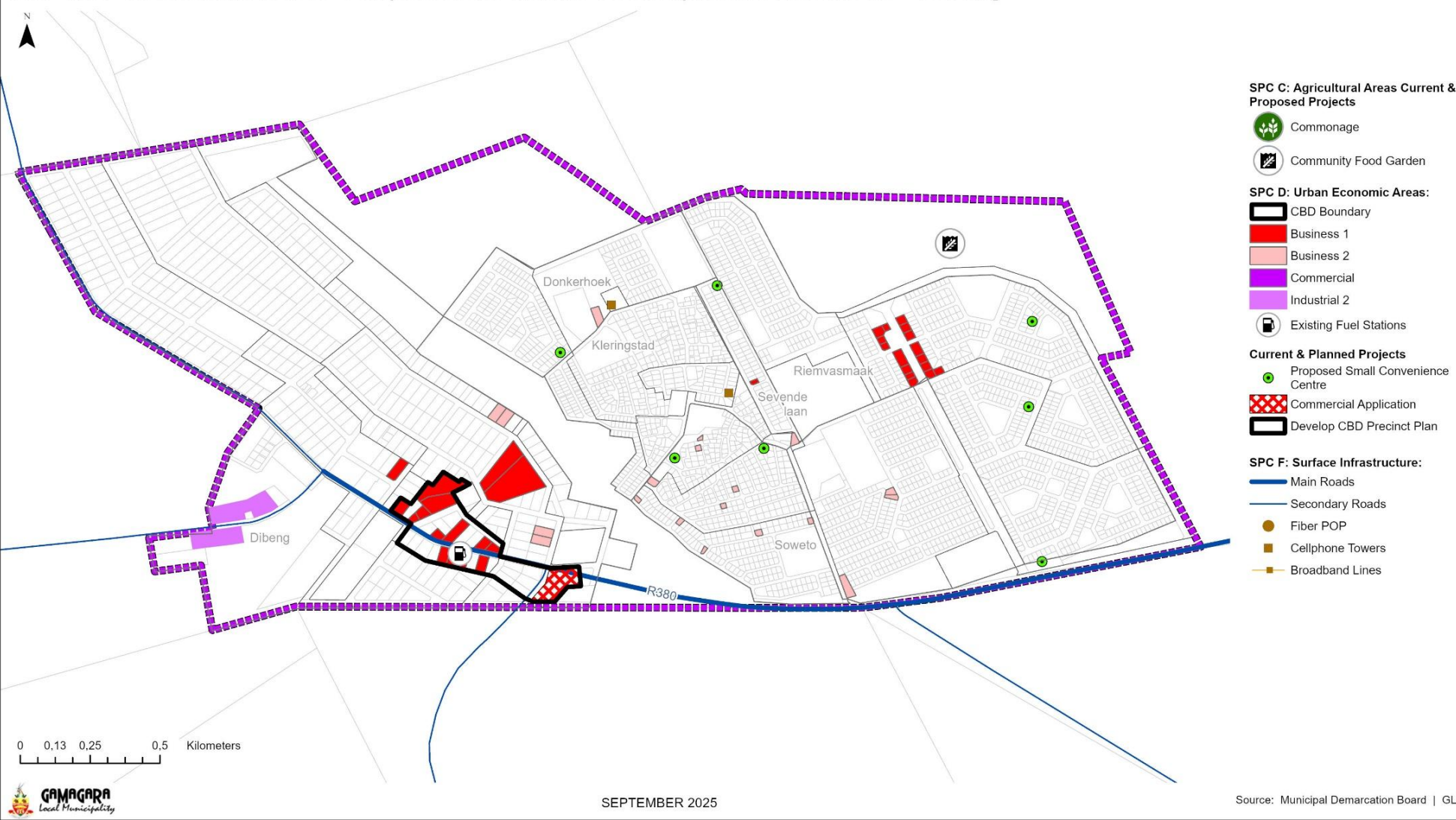


GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

MAP 9.2: Settlement-Level Composite Economic Development Framework - Olifantshoek



GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK
MAP 9.3: Settlement-Level Composite Economic Development Framework - Dibeng



14. Human Settlements & Social Amenities Framework Development Plan

14.1 Introduction

Human settlements are the backbone of sustainable development, as they shape how communities live, access services, connect to work, and participate in social and cultural life. A settlement is sustainable when **housing, social amenities, public space, and infrastructure** are integrated into a functional whole. This framework therefore combines human settlements and social amenities into one plan, recognising that neither can succeed in isolation.

14.2 Spatial Context

The settlement pattern of Gamagara is dominated by Kathu as the primary node, with Olifantshoek and Dibeng as secondary settlements, and smaller rural communities completing the hierarchy. Growth is shaped by mining-linked migration and new investments in renewable, manufacturing, and wholesale and retail trade.

Key contextual factors include:

- ▶ **Housing demand and affordability:** Housing in Kathu is prohibitively expensive, forcing many employees to live in neighbouring municipalities, creating economic leakage and commuting inefficiencies.
- ▶ **Housing backlog and supply deficits:** Rapid growth outpaces supply, while prices remain high. Projects such as Kathu 5700 will assist, but additional interventions are essential to normalise affordability.
- ▶ **Facility backlogs:** Gamagara already faces a backlog of 46 facilities, with an additional 285 required by 2044, totalling 331 facilities. Land requirements are at least 291 ha, while only ~98 ha is currently zoned, creating a major deficit.
- ▶ **Settlement constraints:** Dolomite-prone areas in Kathu and floodline risks in Olifantshoek and Dibeng limit outward expansion. Urban Development Boundaries (UDBs) are essential to discipline growth.
- ▶ **Township upgrading and informality:** Informal settlements remain widespread (Mapoteng, Sesheng, Dibeng, Olifantshoek), requiring in situ upgrading and formalisation.

- ▶ **Uneven amenities distribution:** Amenities are concentrated in Kathu, with significant shortages elsewhere. Planned new schools in Kathu and Dibeng will contribute to balance this.

14.3 Key Opportunities and Considerations

14.3.1 Human Settlements

Human settlement development must respond to pressing affordability challenges, the structure of the local workforce, and spatial constraints.

- ▶ **Expand housing supply** across the full spectrum (subsidised, GAP, rental, social housing, bonded) to stabilise property and rental markets.
- ▶ **Diversify housing typologies** by promoting medium- to high-density formats (townhouses, flats, social housing), better suited to transitional and mobile workforces.
- ▶ **Increase rental accommodation**, particularly long-term options, to address affordability and mobility needs.
- ▶ **Plan for construction worker accommodation:** Major programmes (GBIP, RBIG, Kathu 5700, KIP, Farm 736, Bestwood) will attract thousands of temporary workers. Development applications and tenders must specify dedicated, serviced accommodation camps to avoid informal settlements that may become permanent.
- ▶ **Township upgrading and formalisation:** Prioritise Mapoteng, Sesheng, Olifantshoek, and Dibeng. Formalisation must include services, amenities, and tenure.
- ▶ **Compact form and densification:** Promote infill and densification within UDBs before outward expansion.
- ▶ **Protect key land uses:** Prevent encroachment on institutional, utility, and transport land to ensure long-term settlement functionality.

14.3.2 Social Amenities

Social amenities are critical to community well-being and must be expanded in line with population growth, housing development, and settlement upgrading.

- ▶ **Quantified demand:** Provide at least 331 new facilities by 2044.

- ▶ **Land requirement:** Allocate additional land to close the 193-ha deficit between demand and currently zoned land.
- ▶ **Schools and education:** Implement the **Sishen New Secondary School** and the **planned Dibeng Secondary School**. Expand ECD provision in new layouts.
- ▶ **Health facilities:** Deliver the Level 1 Casualty Facility in Kathu and expand clinics in Olifantshoek and Dibeng.
- ▶ **Sports and recreation:** Upgrade Dibeng's sports field (under implementation) and partner with sporting associations to ensure compliance with codes, enabling regional event hosting and sports development pathways.
- ▶ **Climate-sensitive design:** Future indoor facilities (halls, clinics, libraries) must integrate cooling systems to manage heat exposure risks.
- ▶ **Parks and public space:** Develop multi-functional parks with stormwater management and water features.
- ▶ **Place-making:** Improve town entrances, signage, wayfinding, and tree lines across settlements.
- ▶ **Community partnerships:** Engage schools, youth, and local businesses in clean-ups, Arbor Day planting, and beautification, fostering stewardship of public spaces.

14.4 Settlement-Level Considerations

Settlement-level proposals identify specific opportunities, projects and interventions tailored to each settlement in Gamagara, ensuring that the overarching framework translates into practical, localised outcomes that address unique risks, opportunities, and service needs.

14.4.1 Kathu

Kathu is the primary node and regional mining hub, with the most severe housing affordability pressures (see **Map 10.1** for reference).

- ▶ **Kathu 5700 Housing Programme:** Activation of Extensions 6–8 with bulk infrastructure; capacity for ±5,069 units.
- ▶ **Mapoteng PSHDA:** Formalisation of ±611 residential stands; integration into Kathu's urban fabric.
- ▶ **Infill housing:** 200 low-cost units already approved for development in Mapoteng/Sesheng.

- ▶ **Integration zone:** High-density multi-functional zone linking Kathu, Sesheng, and Mapoteng.
- ▶ **Private sector projects:** Sims (±1,247 units), Uitkoms (±159 high-income stands), Bestwood (±1,835 stands; mixed-use node with schools and retail).
- ▶ **Amenities:** **Sishen New Secondary School** (planning) and **Level 1 Casualty Facility** (planning) expand capacity for youth and healthcare.
- ▶ **General:** Expand land zoned Residential II–III; prioritise social housing and rental stock.
- ▶ **Directive:** **Do not allocate any further Residential IV zoning** to avoid proliferation of small residential erven with incompatible informal businesses.

14.4.2 Olifantshoek

Olifantshoek is a secondary settlement with significant growth and upgrading needs, but also faces acute spatial risks linked to flooding and poor connectivity. Addressing these challenges is a priority to ensure safe, integrated, and functional settlement development (see **Map 10.2** for reference).

- ▶ **Floodline risks and township deproclamation:** A township has been proclaimed within the demarcated floodline, placing lives and property at risk. This township must be formally deproclaimed to prevent further investment in unsafe areas.
- ▶ **Relocation of informal settlements in flood-prone areas:** An informal settlement within the floodline must be relocated to safer land, as continued habitation presents unacceptable disaster risks.
- ▶ **In situ upgrading of informal settlements:** Informal settlements outside the floodline, subject to geotechnical confirmation, should be upgraded in situ. This approach enhances tenure security and service access while minimising disruption.
- ▶ **Public Works land transfer:** Land adjacent to the Northern Cape Primary School must be transferred from the Department of Public Works to Gamagara Local Municipality to enable in situ upgrading of the adjoining informal settlement.
- ▶ **Township restructuring:** In Welgelee, rezone, consolidate, and subdivide townships, and convey properties to regularise tenure. In Diepkloof, resurvey and repeg stands to improve order, alignment, and service provision.
- ▶ **Connectivity and integration:**

- Establish a new link road between Olifantshoek Old Town and the newer eastern settlements (Welgelee and Diepkloof) to integrate the settlement and support economic and social interaction.
- Many existing roads lie in low-lying flood-prone areas, creating risks of isolation during heavy rains when residents cannot access schools, workplaces, retail, or services. While detailed solutions are addressed in the Infrastructure Framework Development Plan, improving access and resilience of the road system is critical for settlement functionality.
- ▶ **Zoning controls: No further Residential IV zoning** should be permitted in Olifantshoek, to avoid the proliferation of informal or incompatible land uses in residential areas.
- ▶ **Community amenities:** Upgraded libraries (Welgelee, Olifantshoek); new cemetery (ideation); parks in Diepkloof, Dittlouw, and Welgelee.

14.4.3 Dibeng

Dibeng is a growing settlement strategically located along the R380, with significant infrastructure investments already underway. However, it faces major challenges linked to informal settlement growth, floodline risks, and under-provision of social amenities ((see **Map 10.3** for reference).

- ▶ **Floodline risks:** No further development should be permitted within the demarcated 50- and 100-year floodlines to safeguard people and property.
- ▶ **Informal settlement upgrading:** Informal settlements located outside flood-prone areas should be upgraded in situ, subject to geotechnical confirmation.
- ▶ **High-density development:** Support the introduction of Residential 3 development in the Dibeng CBD, provided that geotechnical studies and traffic impact assessments confirm feasibility and that suitable traffic management measures are implemented to accommodate increased flows.
- ▶ **Land regularisation:** Resurvey and repeg properties in Old Dibeng and in Riemvasmaak to correct layout misalignments and enable formal conveyancing.
- ▶ **Community safety:** Establish a fire response unit in Dibeng as a pressing priority, to reduce settlement vulnerability and improve disaster preparedness, particularly considering the widespread informal settlements.
- ▶ **Social amenities provision:** Expand facilities to close current deficits and improve quality of life. Priorities include:
 - Establishing a new Dibeng Primary School Offshoot.

- Upgrading of the Dibeng sports field (already underway).
- Upgrading the Dibeng library and park.
- Renovating the existing ECD centre.
- Creating a new public park at the entrance of the town/CBD from the Kathu direction to enhance identity and wayfinding.
- Establishing a new cemetery for Dibeng.

- ▶ **Directive: Do not allocate any further Residential IV zoning.**

14.4.4 Babatas

Babatas is a **community property association** rather than a formalised township, yet it forms an important part of the Gamagara settlement system. While it faces limitations in terms of formal township infrastructure, there are opportunities to strengthen its functioning and improve quality of life.

- ▶ **Access and connectivity:** Upgrade and improve the access road linking Babatas to the N14, to strengthen connectivity with Kathu and regional markets.
- ▶ **Community amenities:** Introduce affordable, small-scale sports facilities to strengthen youth recreation, community identity, and social cohesion.

14.5 Spatial Guidance and Directives

The following directives provide municipality-wide and settlement-specific guidance to ensure that housing and social amenities are delivered in a safe, affordable, inclusive, and sustainable manner. They consolidate priorities for Gamagara while responding to the distinct challenges of Kathu, Olifantshoek, Dibeng, and Babatas.

14.5.1 Human Settlements

The directives for human settlements provide guidance on how land must be managed, settlements upgraded, and housing delivered to ensure safety, affordability, inclusivity, and resilience. They address immediate risks such as floodlines and dolomitic land, while also setting out long-term principles for compact growth, township upgrading, and diversified housing provision.

1. **Housing supply and diversity:** Expand housing provision across all income categories and tenure types, with emphasis on affordable rental and higher-density products (Residential II–III, townhouses, flats, social housing).
2. **Floodline restrictions:** Prohibit any new development in demarcated floodline areas (Kathu, Olifantshoek, Dibeng).
3. **Dolomite risk management:** Implement a Dolomite Risk Management Strategy (DRMS) supported by hazard zonation and SANS 1936 compliance:
 - a. **In high-risk dolomite zones**, prohibit residential development and other vulnerable land uses (e.g. schools, clinics).
 - b. **In moderate-risk zones**, permit development only with approved geotechnical investigations, engineering controls, and ongoing monitoring.
 - c. **In low-risk zones**, allow development subject to standard geotechnical and engineering measures.
4. **Township upgrading and formalisation:** Prioritise in situ upgrading of informal settlements where feasible, subject to geotechnical assessments (Olifantshoek, Dibeng).
5. **Township deproclamation and relocation:**
6. **Deproclaim townships proclaimed within floodlines (Olifantshoek).**
 - a. **Relocate informal settlements** within floodlines to safer areas (Olifantshoek).
 - b. **Land transfer:** Secure transfer of Public Works land adjacent to Northern Cape Primary School to Gamagara Local Municipality for in situ upgrading (Olifantshoek).
7. **Land regularisation:**
 - a. Rezone, consolidate, and subdivide townships in Welgelee; resurvey and repeg stands in Diepkloof (Olifantshoek).
 - b. Resurvey and repeg properties in Old Dibeng and Riemvasmaak (Dibeng).
8. **Structured worker accommodation:** Require all large-scale public and private construction projects (e.g. GBIP, RBIG, Kathu 5700, KIP, Farm 736, Bestwood) to provide dedicated, serviced worker camps.
9. **Residential IV restriction:** Do not allocate any further Residential IV zoning anywhere in Gamagara.
10. **Comprehensive Human Settlements Plan:** Prepare and adopt a municipality-wide plan to align housing, township upgrading, land management, and dolomite risk mitigation.

14.5.2 Social Amenities

The directives for human settlements provide guidance on how land must be managed, settlements upgraded, and housing delivered to ensure safety, affordability, inclusivity, and resilience. They address immediate risks such as floodlines and dolomitic land, while also setting out long-term principles for compact growth, township upgrading, and diversified housing provision.

14.5.2 Social Amenities

The directives for social amenities ensure that communities across Gamagara have access to the social amenities needed to live healthy, productive, and fulfilling lives. They emphasise equitable provision, climate-sensitive design, and partnerships to close current and future backlogs while supporting settlement growth and human development.

1. **Provision priorities:** Prioritise the provision of essential facilities, such as fire and ambulance stations, over other types of municipal community facilities.
2. **Planning standards:** When planning social amenities, consult the CSIR's Guidelines for Social Amenities Provision and the Northern Cape PSDF Toolkit 1: Social Services to guide facility types, accessibility standards, threshold norms, and site size requirements.
3. **Climate adaptation:** Apply the principles of climate change adaptation in the design of new amenities and in the rehabilitation, upgrading, or repurposing of existing ones.
4. **Expanding provision:** Expand the provision of social amenities to ensure **equitable coverage** and meet the needs of a growing population.
5. **Maintenance and rehabilitation:** Maintain and rehabilitate facilities in poor condition to guarantee quality services, enhance community enjoyment, foster pride, and improve urban environments.
6. **Economic alignment:** Develop social amenities that support the municipality's economic growth aspirations, particularly in tourism, and position Kathu as a youth development hub.
7. **Schools:** Implement new schools in Kathu (Sishen Secondary) and Dibeng (Primary Offshoot, Secondary School). Ensure large housing projects (e.g. Kathu 5700, Bestwood) include land for schools and ECDs.
8. **Health:** Establish the planned Level 1 Casualty Facility in Kathu; expand clinic capacity in Olifantshoek and Dibeng.

9. **Safety:** Construct a fire response unit in Dibeng as a pressing matter of community safety.
10. **ECD:** Renovate and expand ECD centres in Dibeng and other settlements.
11. **Sports and recreation:**
 - a. Upgrade Dibeng sports field (ongoing).
 - b. Introduce small-scale, affordable sports facilities in Babatas.
 - c. Partner with sporting associations in designing new facilities to ensure compliance and maximise event-hosting and youth development.
12. **Libraries and parks:** Upgrade libraries and parks in Dibeng and Olifantshoek; create a new public park at Dibeng's CBD entrance.
13. **Cemeteries:** Establish a new cemetery for Dibeng; expand and manage cemeteries in Olifantshoek.
14. **Parks and public space:**
 - a. Design parks as multi-functional spaces for recreation, education, stormwater management, and environmental resilience.
 - b. Incorporate water features that are visually appealing and effective in managing runoff.
 - c. Activate public spaces to encourage community use, reduce crime, and limit environmental degradation.
15. **Conservation areas and green space:** Establish community-managed conservation areas and urban green spaces to enhance town appeal, support urban food gardens, improve food security, and preserve biodiversity. This includes using vacant lots and appropriate floodline land.
16. **Tree coverage:** Extend tree coverage across all towns to improve visual appeal, mitigate the heat island effect, provide natural cooling, and reduce heat exposure.
17. **Cooling and heat risk:** Integrate cooling systems into all new indoor community facilities.
18. **Community partnerships:** Support campaigns for clean-ups, greening, and Arbor Day planting, with active participation of youth, schools, and businesses.

14.6 Conclusion

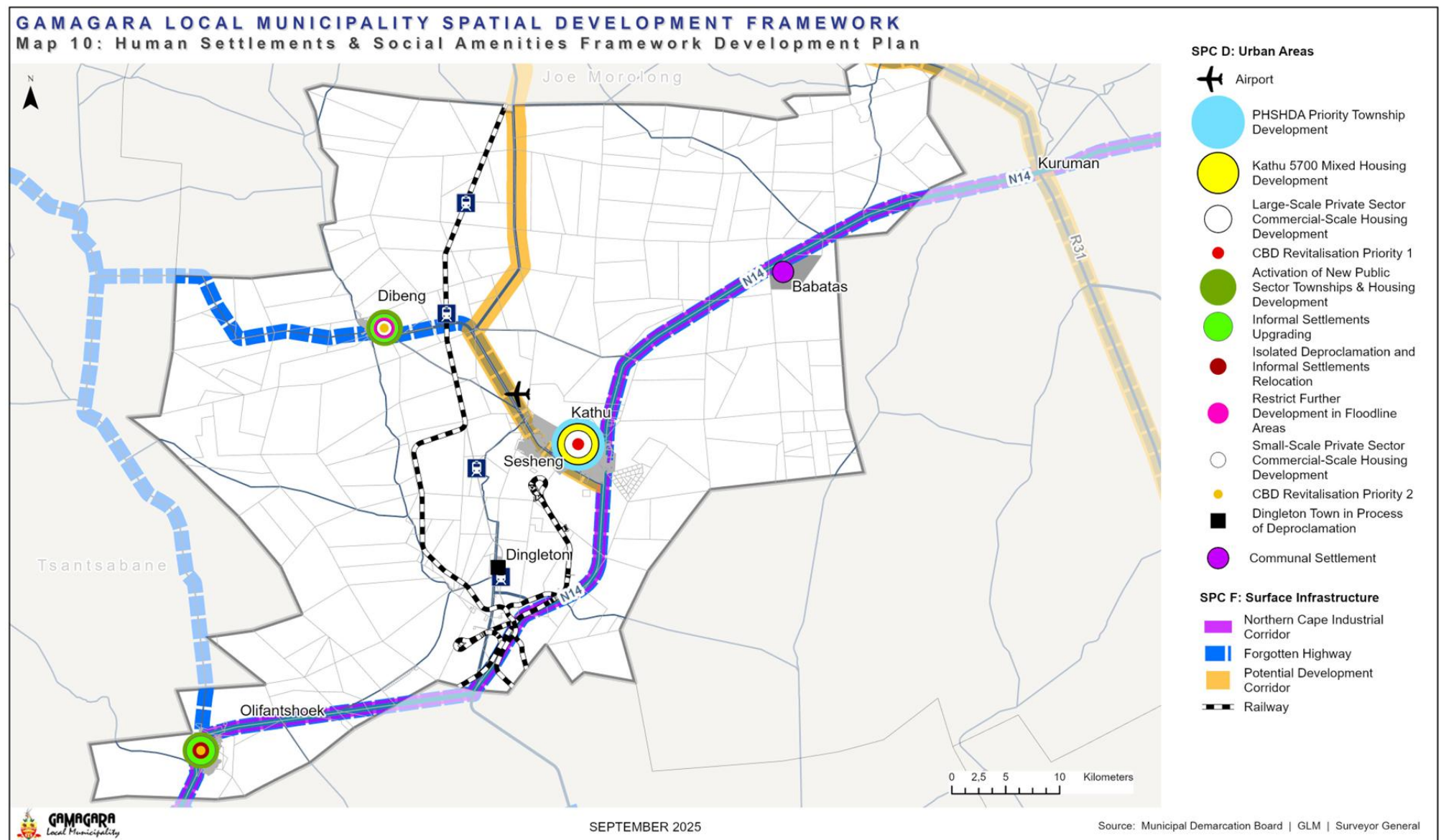
The Human Settlements and Social Amenities Framework Development Plan emphasises that housing and amenities must be planned together to create inclusive, liveable, and climate-resilient settlements. By expanding housing supply, diversifying

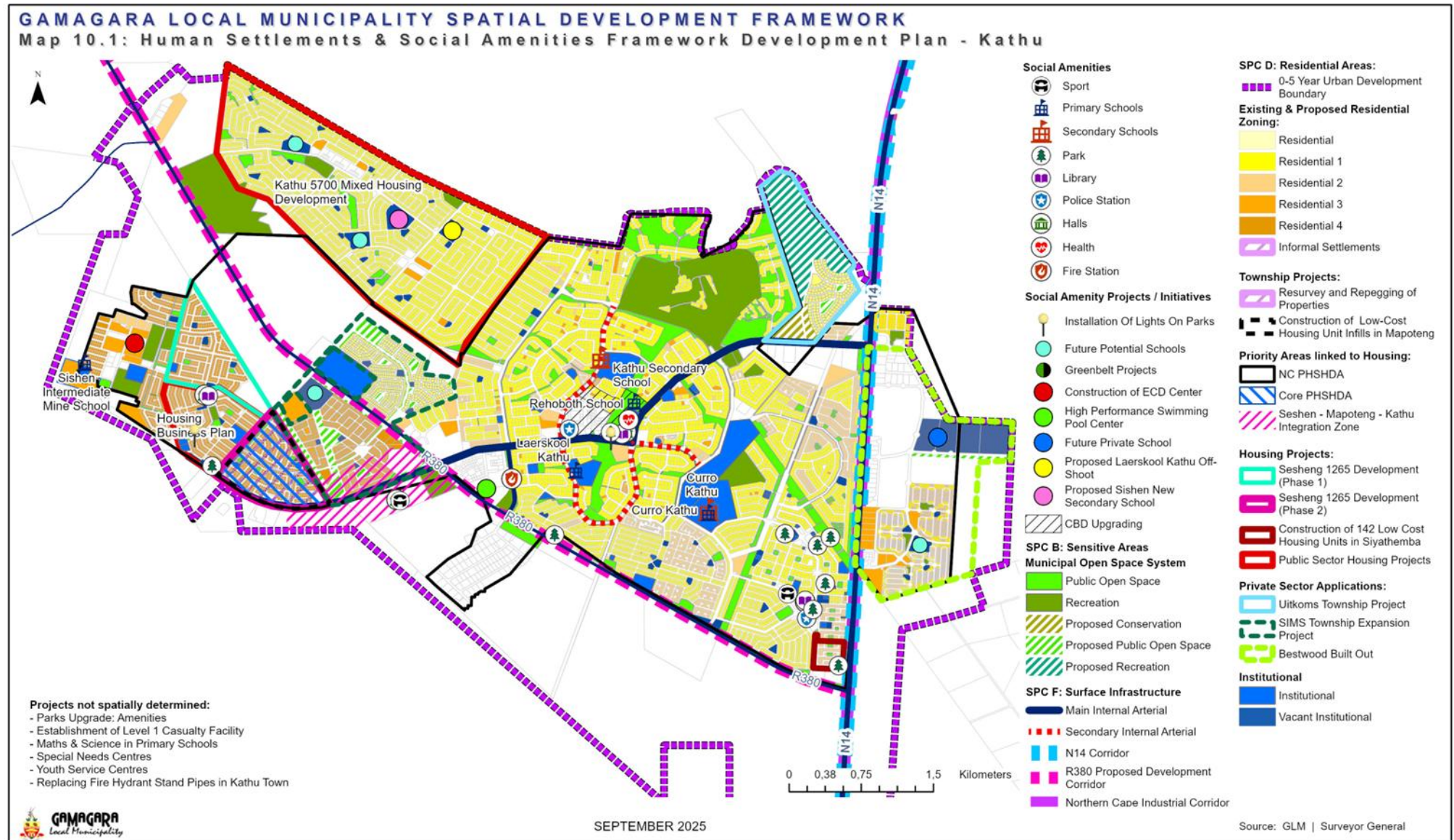
housing products, and regulating worker accommodation, Gamagara can respond to affordability crises and prevent further informality.

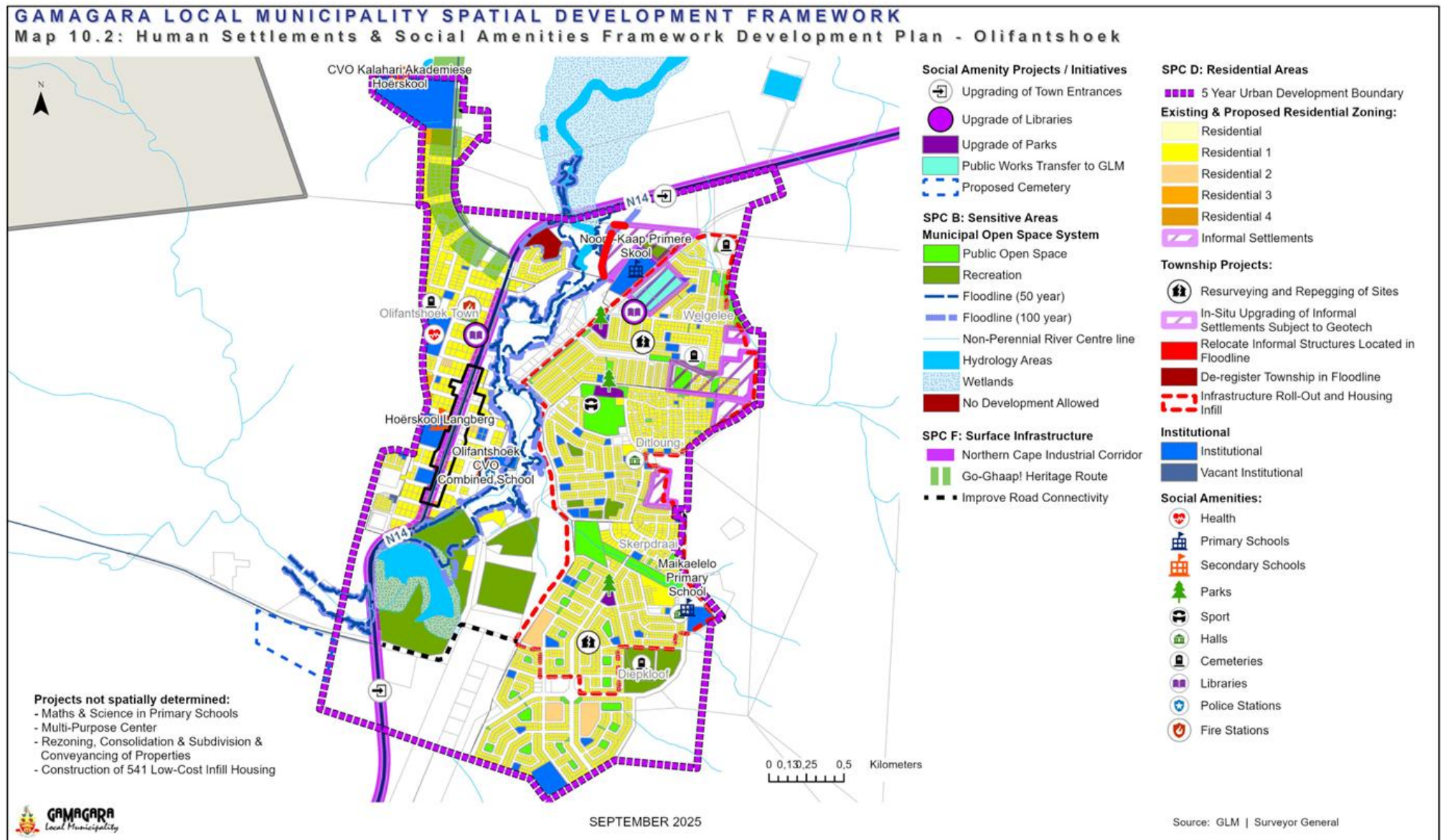
Equally important is the process of settlement formalisation and upgrading, supported by appropriate zoning, land regularisation, and conveyancing to ensure orderly development and secure tenure. Applying risk-sensitive planning principles — including dolomite risk management through DRMS and SANS 1936 compliance, prohibiting development in floodlines, and introducing new fire safety infrastructure such as Dibeng's fire response unit — will further protect communities and strengthen resilience.

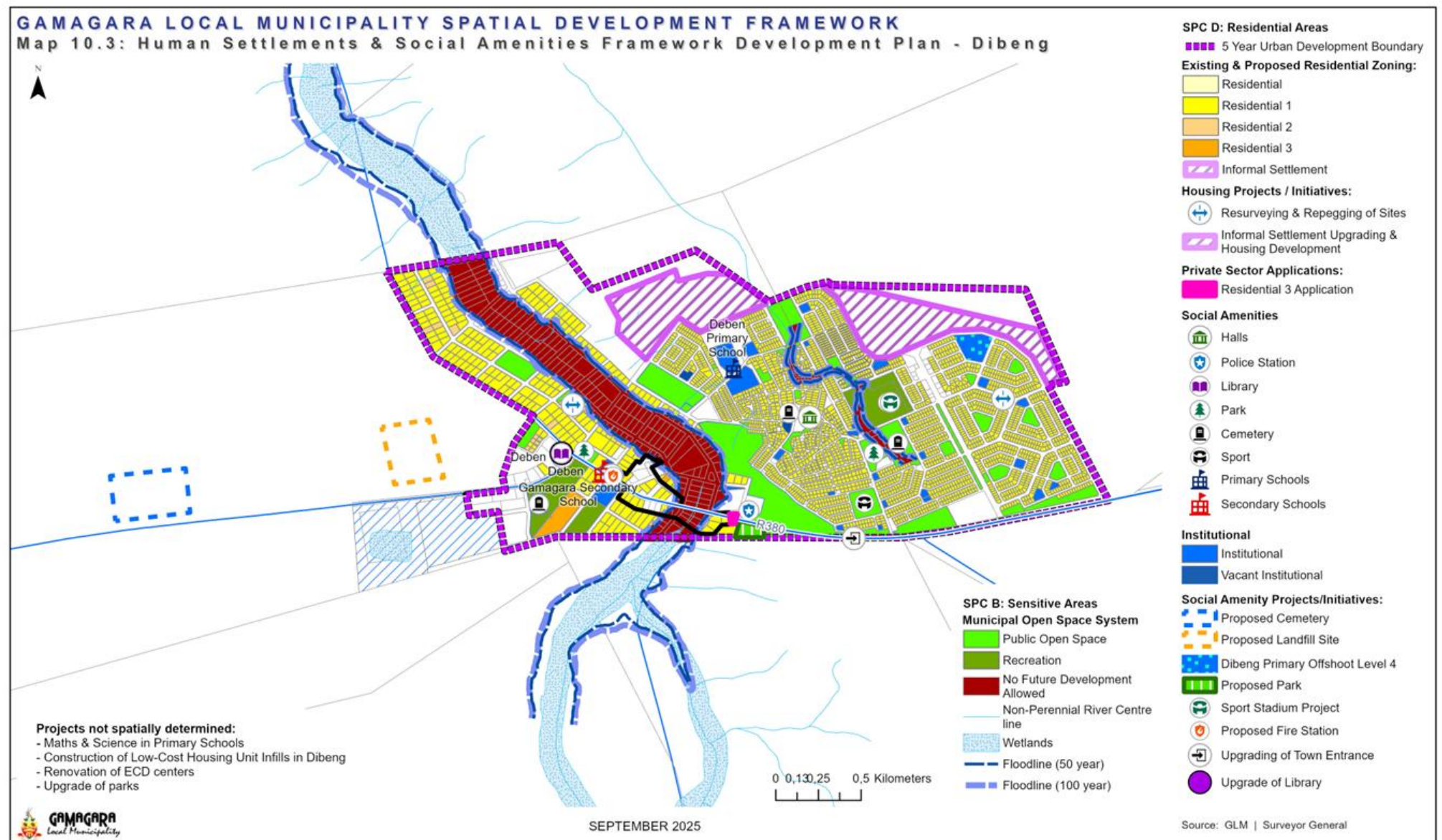
The framework also directs the expansion and upgrading of social amenities, including schools, clinics, libraries, parks, sports facilities, cemeteries, and ECD centres, while embedding climate-sensitive design (cooling systems, stormwater features, tree coverage) and encouraging community stewardship through clean-ups, greening campaigns, and Arbor Day planting.

Together, these measures will not only address immediate pressures but also transform human settlements into safe, integrated, and future-ready communities. The framework aligns directly with PSDF Driver 2: Transforming Spaces and Livelihoods, while also advancing Driver 3: Conservation of Resource Areas and Driver 4: Effective Spatial Governance. It gives effect to SPLUMA principles of justice, sustainability, efficiency, and resilience, ensuring that settlements remain the backbone of Gamagara's transition to a resilient and diversified post-mining economy and society.









15. Infrastructure Framework Development Plan

15.1 Introduction

Infrastructure is the backbone of sustainable settlements and economic growth. It enables the delivery of essential services, supports human development, and provides the foundation upon which a diversified and resilient economy can grow. In Gamagara, infrastructure provision is under mounting pressure from rapid population growth, mining-linked migration, growth in renewable energy, industrial expansion, while also being constrained by finite water resources, ageing assets, and funding limitations.

The Infrastructure Framework Development Plan ensures that infrastructure investment is planned, prioritised, and managed strategically so that services remain reliable, affordable, and sustainable.

15.2 Spatial Context

The infrastructure landscape in Gamagara is shaped by both intense growth pressures and critical vulnerabilities.

- ▶ **Asset portfolio structuring and asset care:** Compared to National Treasury norms, the municipal asset portfolios are not structured to generate sufficient revenue. At the same time, funding for infrastructure renewal and maintenance is inadequate, resulting in accelerating deterioration and eroded service delivery capacity.
- ▶ **Vandalism, losses and illegal connections:** High levels of water losses, electricity losses, vandalism, and illegal connections further undermine infrastructure performance, service reliability, and municipal revenue capacity.
- ▶ **Water:** Kathu's supply is heavily reliant on mine dewatering and municipal boreholes. Future significant expansion will require major investment in bulk treatment, storage, and distribution capacity. Water supply and security remain critical concerns.
- ▶ **Sanitation:** Wastewater treatment works in Kathu and Olifantshoek are at or near capacity and require urgent upgrading. Expansion of sewer networks is needed to service planned developments such as Kathu 5700, Farm 736 Industrial Development, and the Kathu Industrial Park.

- ▶ **Electricity:** Municipal distribution networks are strained by ageing infrastructure, rising demand, high connection costs, vandalism, and theft. Expanded capacity and better maintenance are essential.
- ▶ **Roads and stormwater:** Flood-prone areas in Olifantshoek and Dibeng regularly cut communities off from schools, workplaces, and services. Unpaved and deteriorating roads further undermine accessibility and safety.
- ▶ **Solid waste:** Gamagara generates exceptionally high volumes of solid waste compared to national norms due to (a) high household disposable incomes, (b) weekly mining-related travel inflows, and (c) growth in retail and manufacturing. There is widespread littering and illegal dumping across towns. Landfill capacity at Dibeng — the main site — will be depleted in ± 6 years, underscoring the urgency of alternatives and recycling.
- ▶ **Growth pressures from new developments:** Large projects such as Kathu 5700, Kathu Industrial Park, and Farm 736 will exert significant pressure on bulk, distribution, and reticulation systems. The Gamagara Bulk Infrastructure Programme (GBIP) is designed to expand bulk capacity, while Bestwood will provide internal services but still add load to external networks.
- ▶ **Scale of expansion:** If implemented, the Gamagara Bulk Infrastructure Programme (GBIP) (BFI application) and Sesheng Bulk Water Supply Programm (RBIG application) will double the value of Gamagara's engineering asset portfolios within 5–7 years. This scale increase will require management systems, operating processes, and institutional structures capable of managing infrastructure portfolios of double the current size.

15.3 Key Opportunities and Considerations

The following opportunities and considerations set out the most critical levers for strengthening Gamagara's infrastructure systems. They highlight both immediate interventions and longer-term strategies that can improve service reliability, unlock growth, and build resilience in the face of financial, environmental, and operational constraints.

- ▶ **Water supply and security:** Fast-track bulk water augmentation projects (RBIG, GBIP), enforce water conservation and demand management strategies, reduce water losses, and adopt new technologies to protect infrastructure against vandalism (e.g. borehole bunker designs).
- ▶ **Sanitation:** Prioritise the upgrading of wastewater treatment works and extend sewer networks to accommodate housing and industrial expansion.

- ▶ **Electricity:** Upgrade substations and reticulation networks, while strengthening protection against theft and vandalism.
- ▶ **Roads and stormwater:** Improve the flood resilience of low-lying roads in Olifantshoek and Dibeng, and enhance connectivity through new link roads in Olifantshoek, Sesheng, and Babatas.
- ▶ **Solid waste:** Extend collection services, accelerate recycling and waste-to-value industries, and plan proactively for alternative disposal sites or technologies ahead of the Dibeng landfill reaching capacity.
- ▶ **Asset renewal:** Prioritise renewal of ageing networks, particularly water pipelines, to reduce losses, lower operating costs, and improve margins. More broadly, asset renewal offers an opportunity to future-proof infrastructure by embedding climate-resilient, low-carbon, and resource-efficient technologies and operating practices.
- ▶ **Funding innovation:**
 - **Value capture:** Apply mechanisms such as developer contributions to fund capital development.
 - **External grants:** Expand the municipality's grant funding base by applying not only to mainstream grants (MIG, RBIG, WSIG, INEP), but also to programmes such as the Neighbourhood Development Partnership Grant and other sector-specific or catalytic infrastructure funds.
 - **Blended and soft financing:** Given Gamagara's limited debt leverage and the underperformance of the asset portfolio in generating revenue, future capital programmes should be designed to blend revenue and social performance, improving both financial and developmental outcomes to enhance bankability. This includes targeting concessional or soft development finance and, where possible, ring-fencing project revenues to protect the municipality and lenders while ensuring long-term sustainability.
- ▶ **Project preparation and delivery:** Improve the bankability and accelerate the implementation of the project pipeline through standardised business cases, clear sequencing and prioritisation, and dedicated Project Management Office (PMO) support for mega-programmes.
- ▶ **Institutional capacity:** Scale up infrastructure asset management systems, structures, and staffing to effectively operate and maintain an asset portfolio that is expected to double in value within the next five to seven years. This is not only essential for service delivery but also for securing funding, as external funders increasingly require evidence of robust institutional capacity

and comprehensive asset management practices — including approved asset management plans — before allocating grants or financing.

15.4 Settlement-Level Considerations

15.4.1 Kathu

Kathu, as the municipality's primary node and main growth centre, faces acute pressures on its infrastructure systems. The following interventions are prioritised to support the Kathu 5700 Mixed Housing Development, the activation of the Farm 736 Industrial Development, and the integration of Mapoteng/Sesheng, while also improving resilience, reliability, and spatial connectivity through new and upgraded access roads.

These projects represent a balanced approach to infrastructure provision, comprising new builds, asset renewal, upgrading, and decommissioning and replacement. New builds and upgrades are designed to ensure that economic growth is enabled and infrastructure-led, while also extending service provision to the Mapoteng PHSHDA and uplifting the Sesheng/Mapoteng/Kathu Integration Zone. Asset renewal projects safeguard community wealth and demonstrate proper custodianship — for example, replacing asbestos pipes in Kathu's water network both conserves scarce water resources and reduces water losses. Stormwater interventions enhance resilience against floods, while the fencing of treatment works improves community safety and guards against theft and vandalism.

Cross-Cutting (Multi-Service Infrastructure)

- ▶ Finalise the BFI application and implement the Kathu components of the Gamagara Bulk Infrastructure Programme (GBIP) to activate Extensions 6–8 of the Kathu 5700 Mixed Housing Development as well as the Kathu Industrial Park.
- ▶ Install internal engineering services for the Sesheng/Mapoteng 1,265-unit development.

Water and Sanitation

- ▶ Advance the Sesheng Bulk Water Infrastructure RBIG application and implement.
- ▶ Install a chlorination facility at the Mapoteng reservoir.
- ▶ Construct internal engineering services for the Farm 736 Industrial Development.

- ▶ Upgrade Pump Station G28 from T6 to larger T10 Gorman Rupp pumps, including sump enlargement.
- ▶ Construct a new line between G26 and G28, replacing the mortar pipeline with UPVC, including manholes.
- ▶ Upgrade Minasie Rooisand Pump Station, replacing 3x T4 Series Gorman Rupp with 3x T6 Series units, and clean sump.
- ▶ Construct a new screen at Sishen/Mapoteng EX-06 Pump Station, replacing 4x T4 Series Gorman Rupp with 4x T6 Series units.
- ▶ Repair and reconstruct drying beds at the Kathu Wastewater Treatment Works.
- ▶ Replace asbestos pipes in the Kathu water network.
- ▶ Fence the Kathu Water and Wastewater Treatment Works to improve safety and security.

Electricity

- ▶ Upgrade the electrical sub-station in the Kathu Industrial Area to increase supply capacity and reliability.

Roads

- ▶ Upgrade the Kathu 5700 access road and install internal road surfaces.
- ▶ Upgrade road surfaces between Akasia and Tieroog Roads, and along the main road from Mapoteng to the R380.
- ▶ Upgrade the Hendrik van Eck Road, from the Kathu Village Mall intersection to the Mapoteng four-way intersection.
- ▶ Construct internal roads in Mapoteng (Phase 1 and 2).

Stormwater

- Construct a stormwater berm/channel (663m) on the south-eastern side of Kathu, near the Mapoteng 1,265-unit project.
- Develop a major stormwater culvert and outfall in the low-lying area near the Kameeldoring development.
- Construct a new stormwater outfall culvert north of Kathu, near the golf course.

15.4.2 Olifantshoek

Olifantshoek is a strategically located settlement along the N14, serving as a gateway town within Gamagara. However, its infrastructure faces major deficits: flood-prone areas, water security challenges, limited reticulation networks, and inadequate spatial

connectivity between the historic core and newer suburbs such as Skerpdraai and Diepkloof. The following interventions represent a balanced programme of new builds, upgrading, and renewal. They focus on improving bulk water supply, sanitation, and reticulation to enable township proclamation and housing delivery, upgrading roads and stormwater systems to reduce flood risks, and extending and upgrading electricity networks to activate new suburbs for residential development while also supporting the upgrading of informal areas. Together, these projects will enable Olifantshoek to expand its housing base, enhance resilience, and support growth along the N14 corridor.

Water and Sanitation

- ▶ Bulk Water Supply for Olifantshoek: Augment the Vaal Gamagara Bulk Water Scheme to improve security of supply.
- ▶ GLM Water Programme – Supply of Bulk Water to Olifantshoek: Undertake scoping, feasibility, design, and implementation of a sustainable solution to long-standing water challenges.
- ▶ Construction of Balancing Steel Tank: Improve supply to the 7ML reservoir by optimising borehole abstraction and balancing capacity.
- ▶ Construction of 2ML Elevated Tank Adjacent to 7ML Reservoir: Increase storage to stabilise potable water availability.
- ▶ Water Reticulation of 1,300 Stands (Phase 2): Install internal reticulation and household connections in Diepskloof.
- ▶ Upgrading of Wastewater Treatment Plant / Oxidation Ponds: Expand capacity to accommodate higher volumes linked to population growth.
- ▶ Upgrading of Sewer Reticulation (Welgelee and Ditlounge): Construct new sewer manholes to improve sanitation networks.

Electricity

- ▶ New Electrical Reticulation and House Connections in Ditlounge (Phase 2): Provide access to electricity for 146 households.
- ▶ New Electrical Reticulation and House Connections in Olifantshoek (Phase 3): Provide access to electricity for 400 households in the Noordkaap school stands area.
- ▶ Olifantshoek Bulk Substation Upgrade (10MVA): Expand capacity to cater for current demand and future development.

Roads and Stormwater

- ▶ Internal Road Upgrading (Ditlounge): Upgrade 1.3 km of gravel roads to pavement standard, addressing stormwater challenges along Jood Street, Tlhatlogang Street, and Sesheng Street.
- ▶ New Link Road between Olifantshoek Town and Ditlounge/Skerpdraai: Enhance spatial connectivity and improve access to the town centre.
- ▶ Upgrading of Industrial Road (1.6 km, Welgelee): Upgrade gravel to paved standard to strengthen connectivity.
- ▶ Construction of Bridge/Culvert Crossing at Industrial Road: Improve access and safety for residents of Ditlounge and Skerpdraai.
- ▶ Upgrading of Roads and Stormwater in Low-Lying Areas (Welgelee): Address flooding risks by rehabilitating vulnerable road sections and associated stormwater infrastructure.

15.4.3 Dibeng

Dibeng is a rapidly growing settlement where bulk water supply, sanitation roll-out, and township formalisation are the most pressing priorities. The projects identified focus strongly on securing water availability, rolling out sewer networks and toilet structures, and finalising township establishment conditions. This ensures that upgrading and formalisation can proceed, enabling housing development, property transfer, and tenure security.

The emphasis is on bulk provisioning to stabilise Dibeng's water system, expanding sewer networks to serve 797 stands, and completing toilet and house connection programmes. Roads, stormwater, and solid waste projects complement these efforts by enhancing resilience, safety, and environmental compliance. Collectively, the projects represent a balanced approach: new builds to expand capacity, upgrading to support growth and formalisation, and environmental measures to restore degraded areas.

Water and Sanitation

- ▶ GLM Water Programme – Supply of Bulk Water to Dibeng: Scoping, feasibility, design, and implementation of a comprehensive solution to address Dibeng's persistent water challenges.
- ▶ Dibeng bulk water augmentation (Phases 1–2): Increase potable water supply through equipping boreholes, upgrading bulk infrastructure, and improving system resilience.

- ▶ Upgrading of Dibeng bulk water infrastructure (Phase 1): Develop additional water sources via previously drilled boreholes.
- ▶ Construction of 700ML Elevated Storage Facility: Provide reliable water storage capacity to buffer peak demand and disruptions.
- ▶ Construction of a Reservoir in Dibeng: Expand water storage to strengthen long-term water security.
- ▶ Dibeng Sewer Network Phase 4 – 797 Stands: Full waterborne sanitation for 797 households, with pipelines, erf connections, and manholes.
- ▶ Dibeng Toilet Top Structures and House Connections (linked to Phase 4): Construction of 167 new masonry toilet top structures.
- ▶ Dibeng Sewer Network Phase 5: Repair and completion of 130 incomplete masonry toilet top structures.
- ▶ Dibeng Toilet Top Structures and House Connections (linked to Phase 5): Finalise connections to ensure full sanitation rollout.

Solid Waste

- ▶ Rehabilitation of the Current Landfill Site: Environmental restitution and compliance, as the available airspace has been consumed.

Roads

- ▶ Construction of Internal Roads in Dibeng: 1.3 km paved road to improve mobility and accessibility.

Stormwater

- ▶ Bridge/Culvert Crossing at R380: Upgrade crossing to improve safety and connectivity.
- ▶ Construction of Retention Ponds (Old Graveyard): Develop two retention ponds to manage stormwater and reduce flood risks.

15.4.4 Babatas

Babatas, a small community property association along the N14, is not a formal township and has no zoning system. Infrastructure investments have shifted from water to basic access and sanitation, with the aim of improving connectivity, reducing isolation, and addressing service backlogs.

Roads and Access

- ▶ Construction of an Access Road: Replace degraded gravel access road that floods and erodes during rains, ensuring reliable connectivity to the N14.

Sanitation

- Babatas Dry Sanitation Project: Provide individual household dry sanitation systems to eradicate the backlog and deliver a basic level of service in line with DWS and MIG standards.

15.5 Spatial Guidance and Directives

The following directives provide municipality-wide and settlement-specific guidance for the planning, investment, and management of infrastructure systems, ensuring that they are resilient, efficient, financially viable, and supportive of sustainable settlements and economic growth.

1. **Strategic asset management:** Develop and implement a Strategic Asset Management Plan (SAMP), supported by sectoral asset management plans. These must guide lifecycle management of infrastructure portfolios, address risks (dolomite, flood, fire, vandalism), and provide a roadmap for improving practices and governance.
2. **Asset management systems:** Scale up institutional systems, structures, and staffing to effectively manage a portfolio expected to double in value within 5–7 years. Strengthen infrastructure asset registers, maintenance scheduling, and performance monitoring. Demonstrate robust asset management practices to meet funder requirements, as external grantors increasingly demand approved SAMPs and evidence of institutional capacity before allocating finance.
3. **Sectoral master and O&M plans:** Prepare sector-focused master plans (water, sanitation, roads, electricity, solid waste) to quantify demand and identify engineering solutions, supported by operations and maintenance plans that restore expenditure on renewal and R&M to benchmark levels.
4. **Project preparation and delivery:** Standardise business case and bankability packs for CIF projects, strengthen sequencing and prioritisation, and establish a dedicated PMO to accelerate mega-programme delivery (GBIP, RBIG).
5. **Funding innovation:**
 - a. Apply **value capture mechanisms** such as developer contributions to recover part of the value created by public infrastructure investments.
 - b. **Broaden grant funding** applications beyond mainstream grants (MIG, RBIG, WSIG, INEP) to include catalytic instruments such as

the Neighbourhood Development Partnership Grant and other sector-specific programmes.

- c. Pursue **blended and soft financing:** design capital programmes to combine revenue and social performance, improve bankability, and target concessional development finance. Where appropriate, ring-fence project revenues to protect municipal balance sheets and provide security for lenders.
6. **Water security:** Fast-track augmentation projects (RBIG, GBIP), enforce water conservation and demand management, and introduce technologies to protect water infrastructure against vandalism.
7. **Sanitation:** Upgrade wastewater treatment works in Kathu and Olifantshoek and extend sewer networks to support housing and industrial expansion.
8. **Electricity:** Upgrade substations and reticulation networks, expand capacity for renewable integration, and improve maintenance to counter vandalism and theft.
9. **Roads and stormwater:** Upgrade flood-prone roads, construct new link roads (Olifantshoek, Sesheng, Babatas), and prioritise paving of key access routes.
10. **Solid waste:** Plan for new landfill sites or alternatives ahead of Dibeng landfill depletion, expand recycling and waste-to-value industries, and address widespread littering and illegal dumping.
11. **Resilience:** Embed climate change adaptation across all infrastructure systems, with design solutions that lower the carbon, energy, and water footprints of assets.
12. **Community partnerships:** Encourage community participation in waste management, road upkeep, and public space stewardship, reinforcing ownership and sustainability.
13. **Cross-framework integration:** Ensure infrastructure provision aligns with settlement upgrading, biophysical risk management, economic growth sectors, and tourism development.

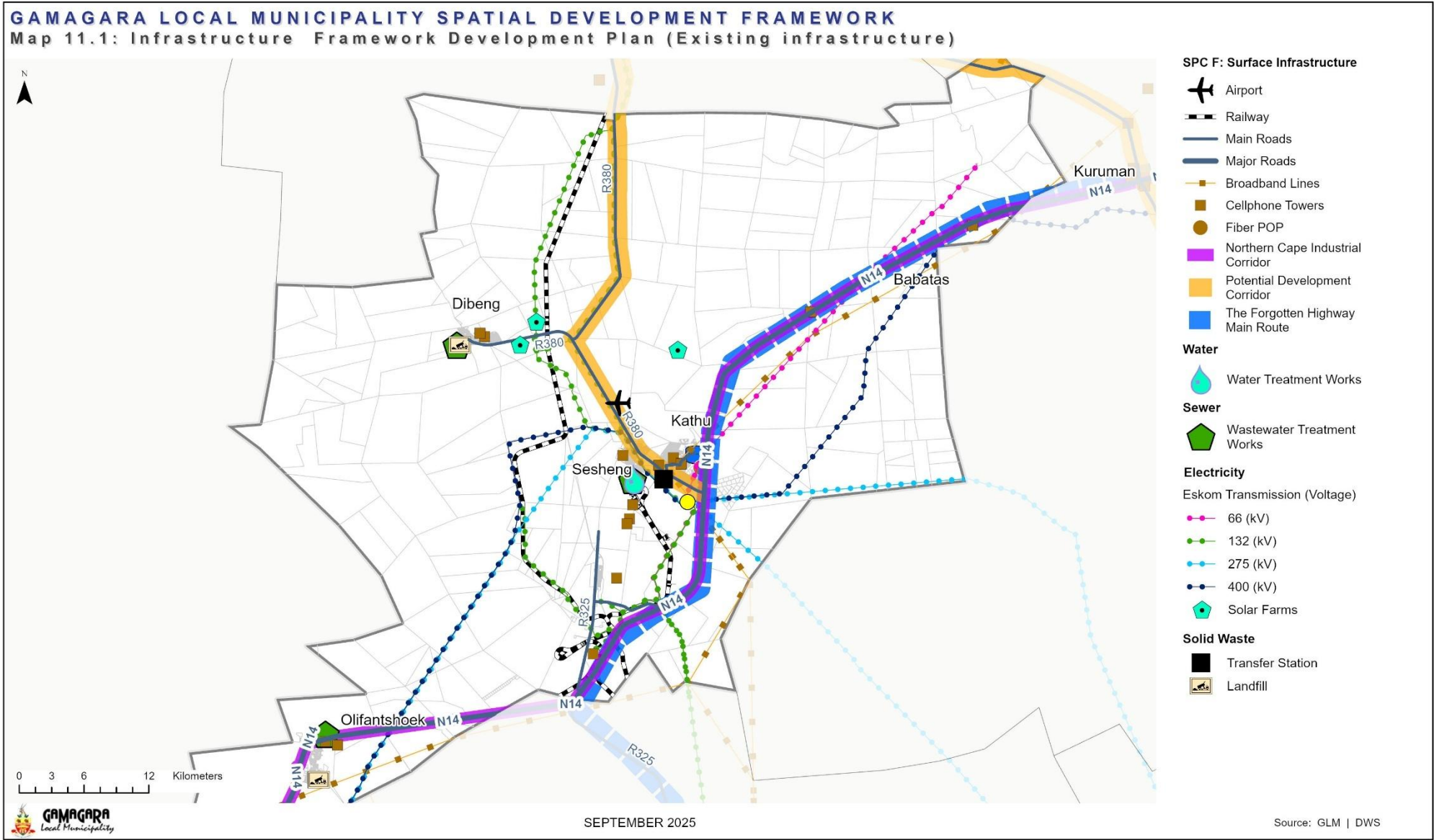
15.6 Conclusion

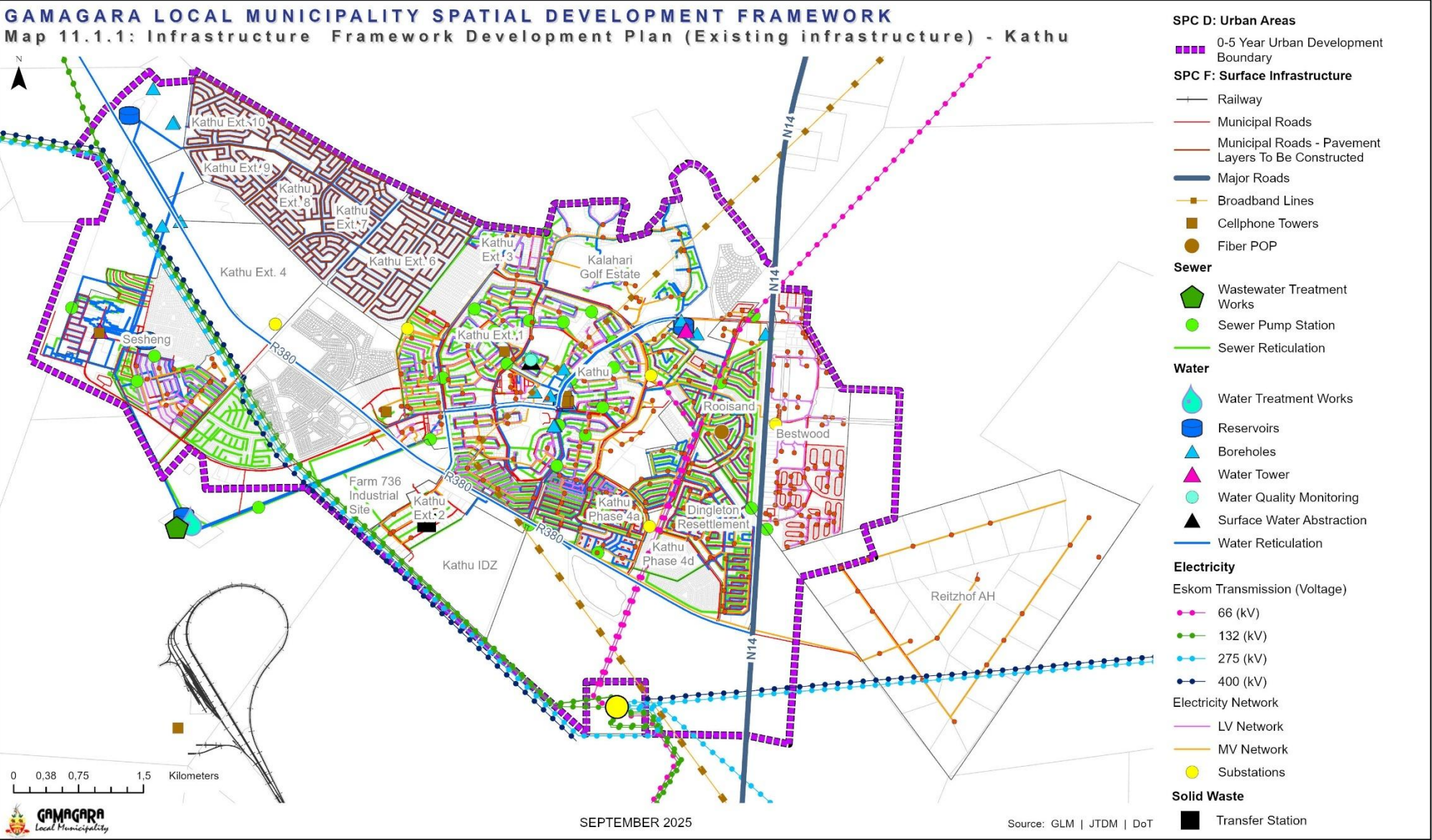
The Infrastructure Framework Development Plan provides the foundation for Gamagara's long-term sustainability. It recognises that infrastructure is not only a technical enabler of growth, but also a determinant of settlement resilience, social equity, and environmental stewardship. By addressing water and sanitation backlogs, modernising electricity and roads, embedding climate resilience in stormwater

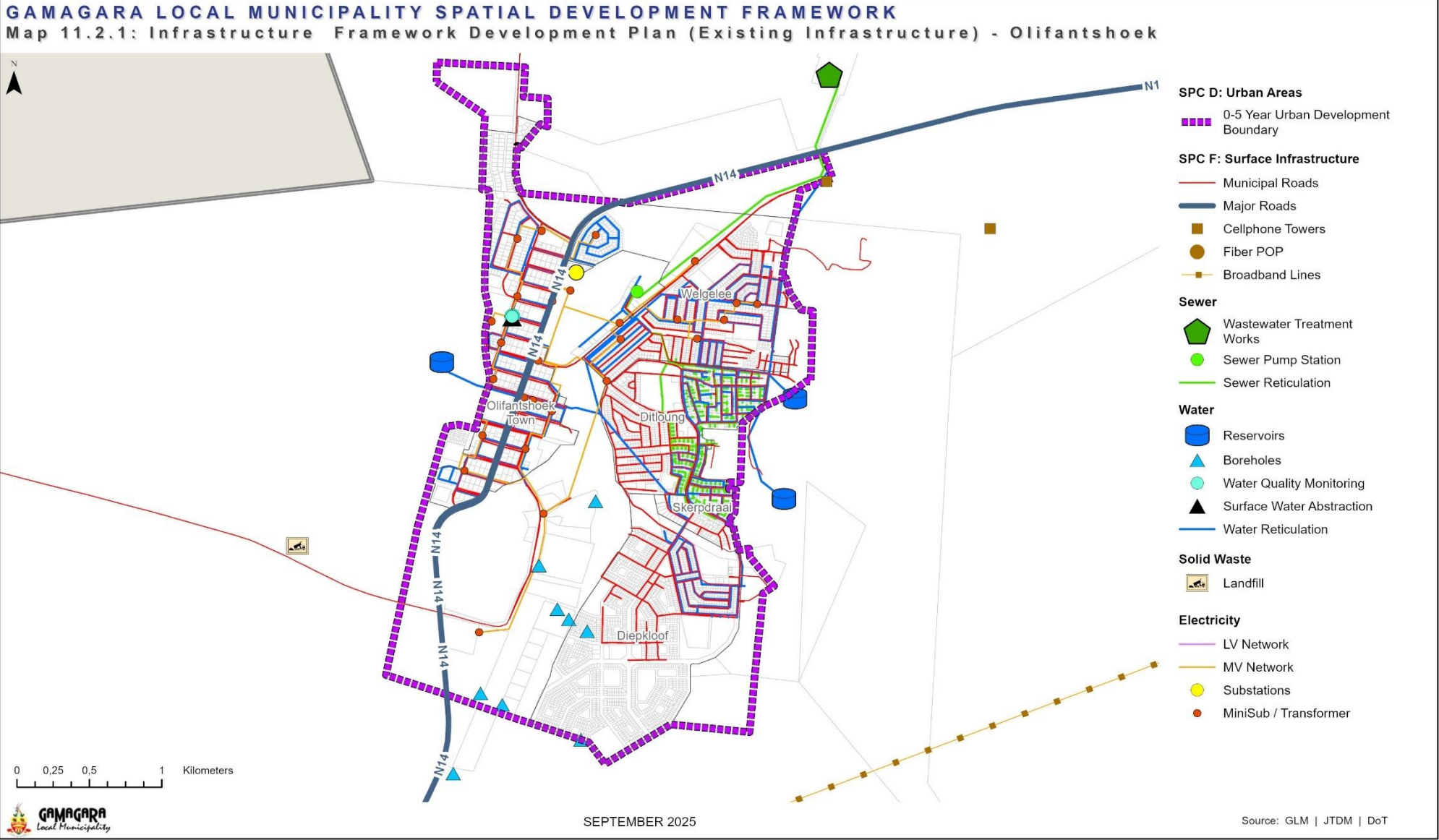
systems, and tackling solid waste challenges, Gamagara can safeguard its communities while unlocking economic opportunities.

The plan emphasises a balanced approach — combining new builds, upgrading, renewal, and decommissioning — to ensure that infrastructure both enables future growth (housing, industry, township proclamation) and protects community wealth through better asset care and renewal. The expected doubling of the engineering asset portfolio over the next five to seven years underscores the urgency of strengthening institutional capacity, scaling asset management systems, and adopting innovative funding mechanisms to improve bankability.

This framework aligns with PSDF Driver 1: Thriving Economic Engines (by enabling diversified economic growth), Driver 2: Transforming Spaces and Livelihoods (by improving equitable access to reliable services), and Driver 3: Conservation of Resource Areas (through efficient water use and waste recycling). It reinforces SPLUMA principles of efficiency, resilience, sustainability, and spatial justice, positioning Gamagara's infrastructure systems as the backbone of its transition to a diversified, future-ready economy and society.

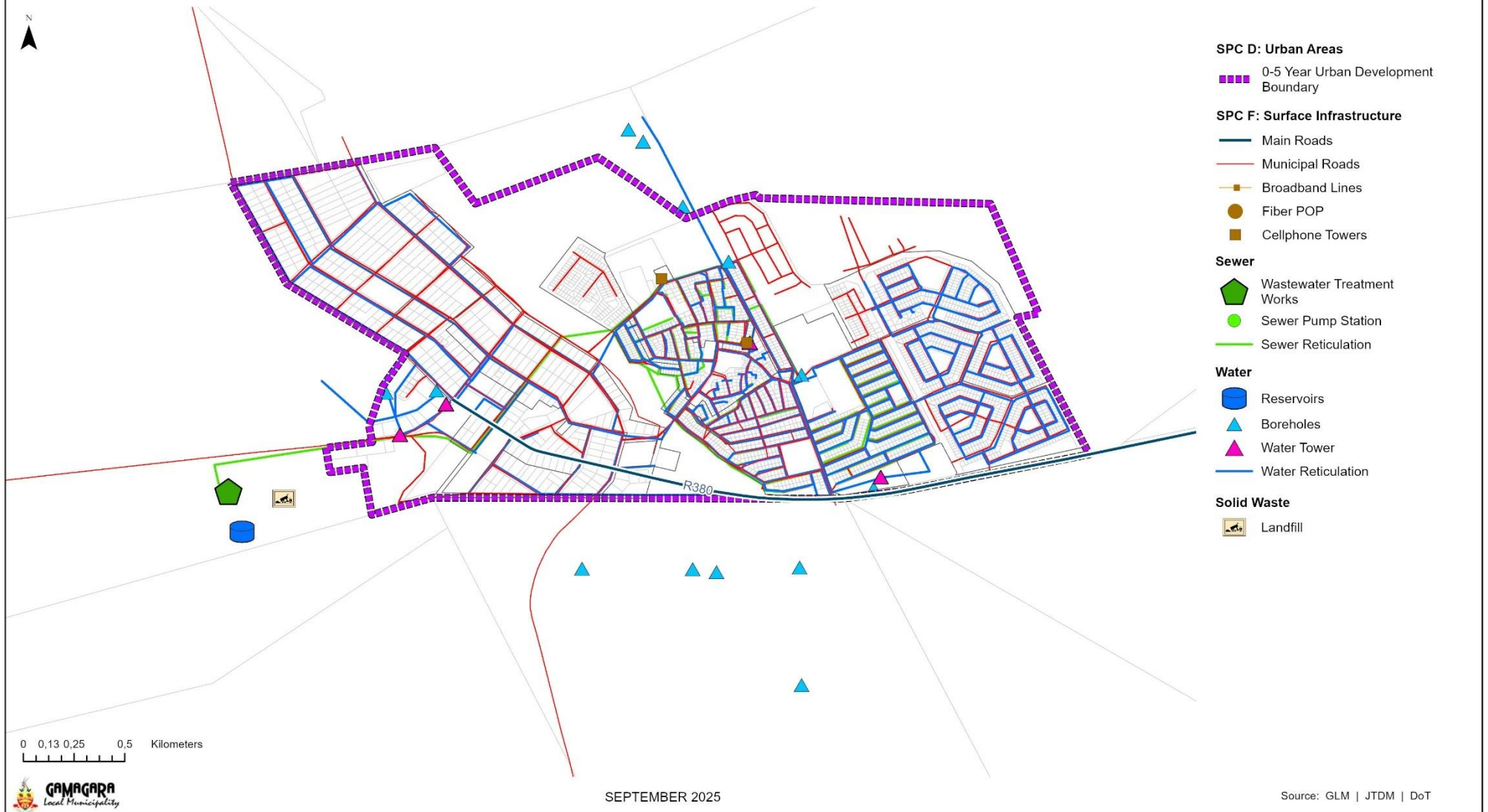




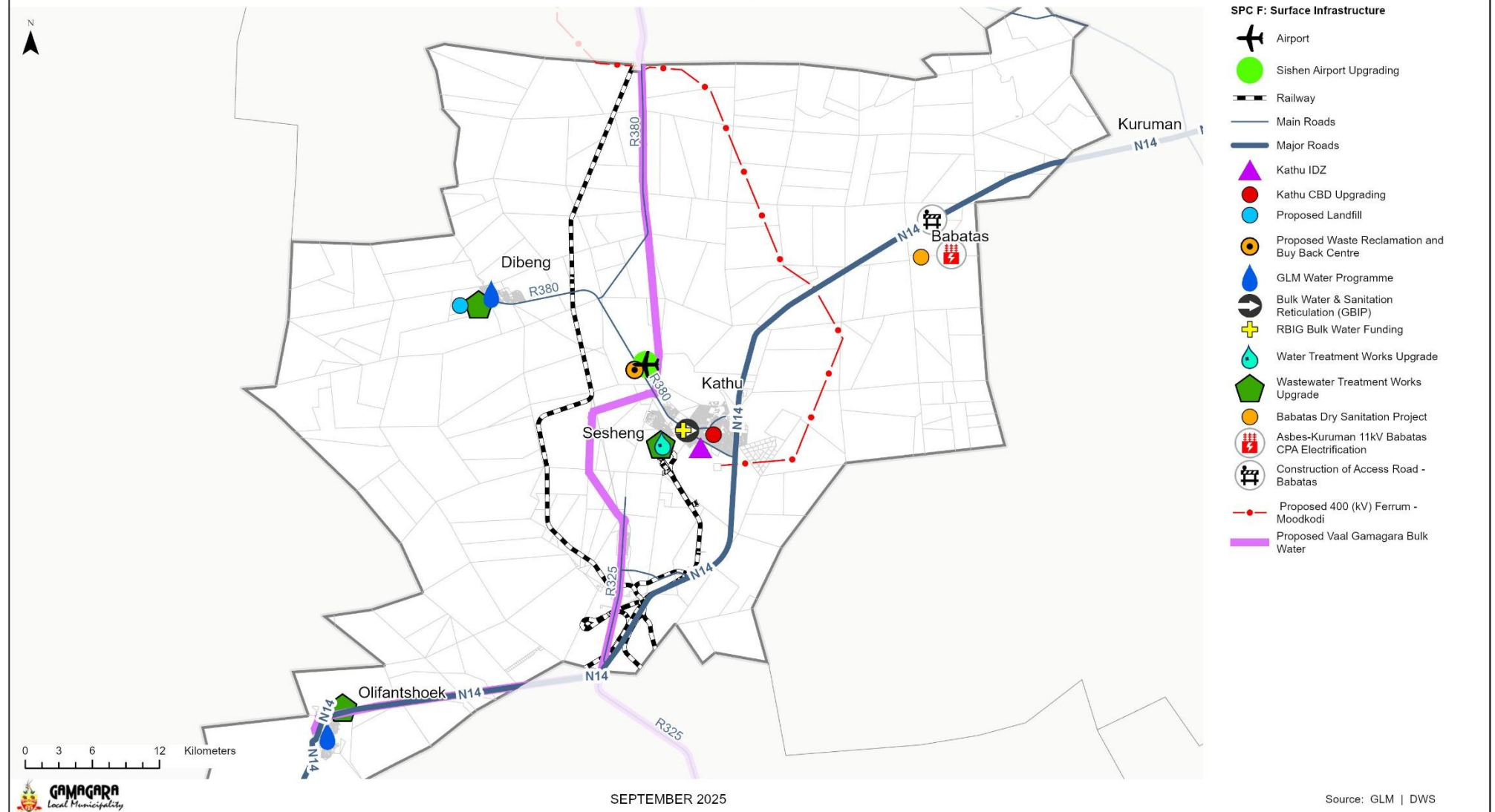


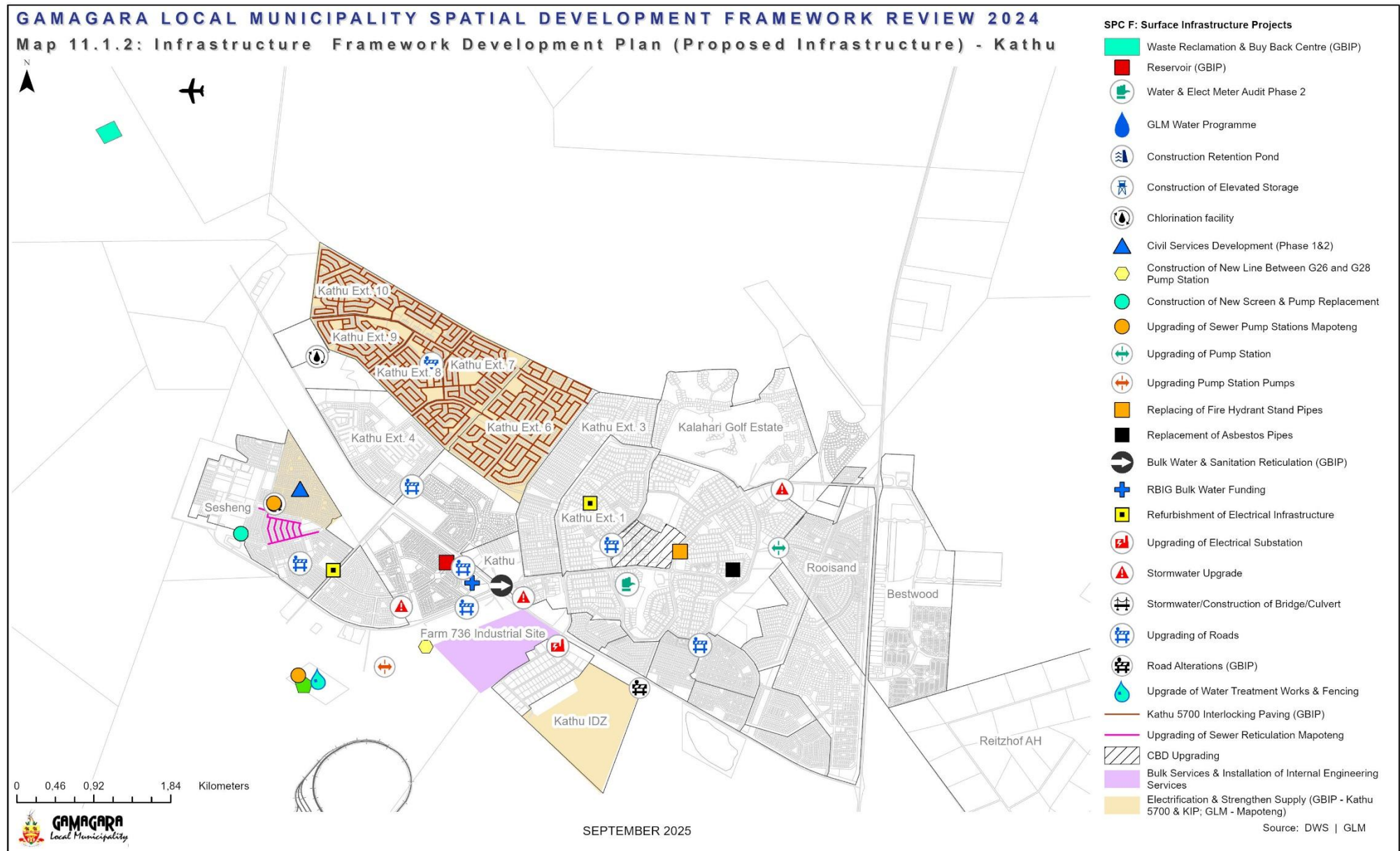
GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK

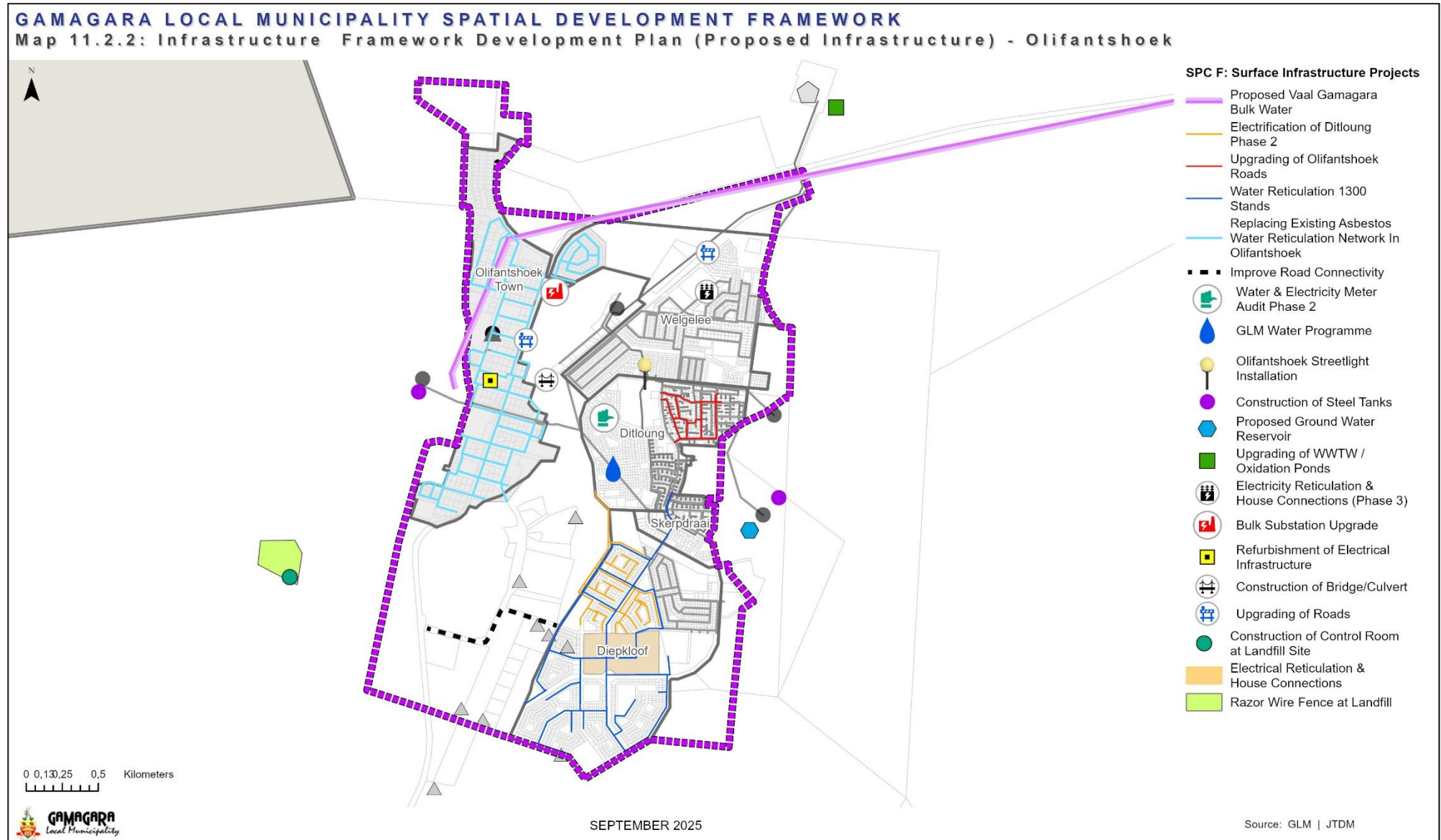
Map 11.3.1: Infrastructure Framework Development Plan (Existing infrastructure) - Dibeng

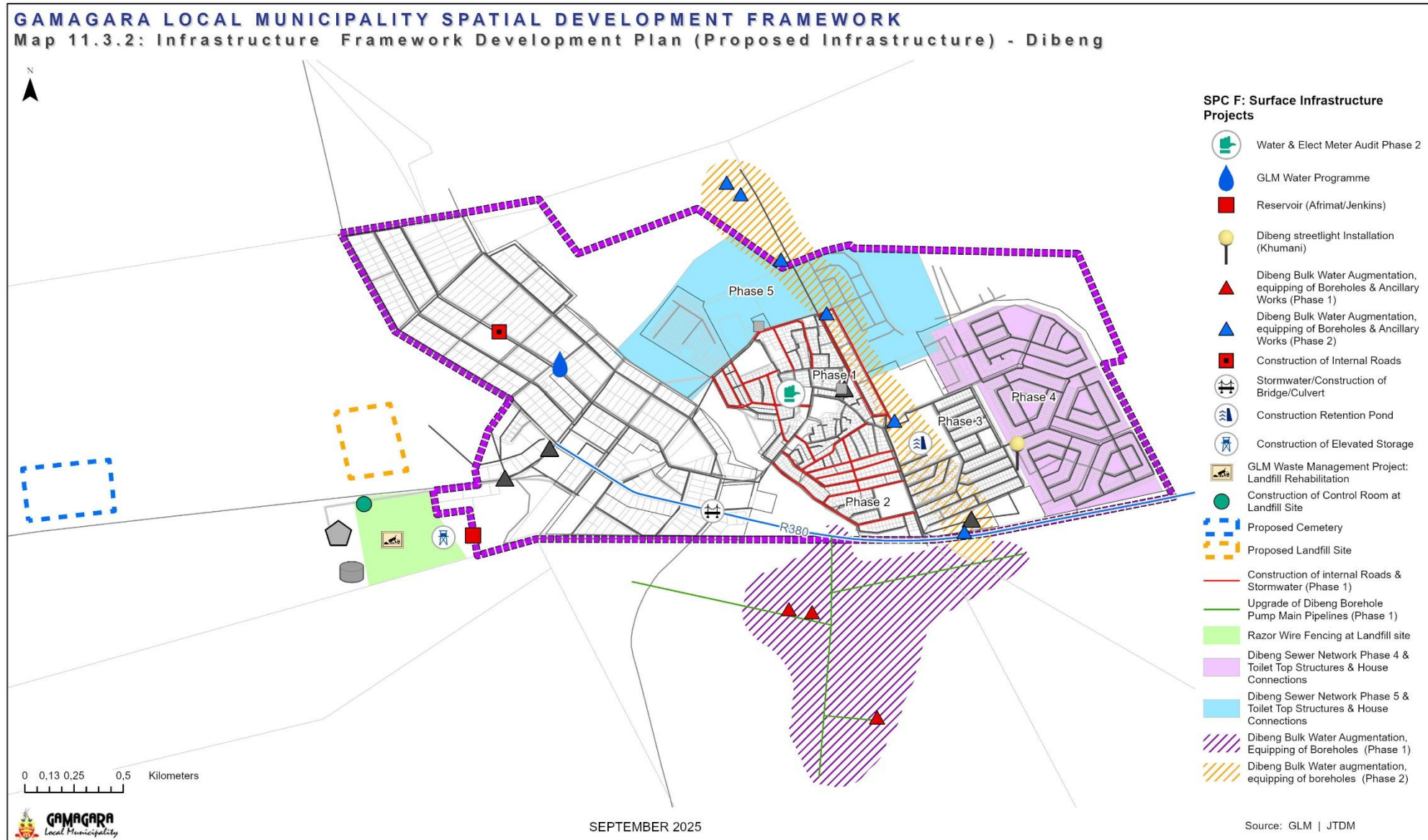


GAMAGARA LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK **Map 11.2: Infrastructure Framework Development Plan (Proposed Infrastructure)**









16. Composite Built Environment Framework Development Plan

16.1 Introduction

The Composite Built Environment Framework consolidates the Human Settlements & Social Amenities Framework Plan (Section 14) and the Infrastructure Framework Development Plan (Section 15) into a single, coherent strategy for guiding the spatial growth and physical development of Gamagara.

Whereas the economic framework provides the sectoral basis for diversification beyond mining, the built environment framework provides the physical platform to sustain growth, ensure resilience, and enhance liveability. This section draws together the priorities for settlement formalisation, housing provision, and social amenities with those for bulk and reticulation infrastructure provision, asset renewal, and climate-resilient infrastructure systems. Together, they create the enabling conditions for inclusive, well-served, and sustainable settlements.

16.2 Spatial Context

The built environment of Gamagara is characterised by rapid growth pressures, uneven settlement development, and infrastructure systems operating close to or beyond capacity.

- ▶ **Housing pressures:** In Kathu, housing costs are prohibitively high, driving workers to neighbouring towns and municipalities. The lack of affordable and diverse housing products (townhouses, flats, long-term rentals) creates inefficiencies, increases commuting, and undermines social integration.
- ▶ **Settlement upgrading and formalisation:** In Olifantshoek and Dibeng, significant parts of new residential areas remain unformalised, with proclamation and tenure delayed by insufficient bulk and reticulation services. Informal settlements located in high-risk areas (floodlines, dolomitic zones) further complicate settlement management.
- ▶ **Social amenities:** Community facilities, including schools, clinics, sports, and recreation, are unevenly distributed. Existing facilities often lack climate-sensitive design, limiting their resilience and usability. New amenities are needed to serve expanding communities in Kathu, Dibeng, and Olifantshoek.
- ▶ **Infrastructure stress:** Water security is the most binding constraint to further growth. Sanitation networks and wastewater treatment works are at or near capacity, while roads, stormwater, and solid waste systems are overstretched. Major infrastructure augmentation programmes (GBIP, RBIG) are designed to expand bulk capacity, but will double the size of municipal asset portfolios, demanding stronger asset management capacity.
- ▶ **Spatial integration:** Gaps in spatial connectivity between historic town centres and new suburbs, as well as the fragmentation between mining settlements and municipal towns, undermine cohesion. Roads, linkages, and urban design must bridge these divides.

16.3 Key Opportunities and Considerations

The Composite Built Environment Framework highlights the following cross-cutting opportunities and considerations:

- ▶ **Enabling growth and diversification:** Coordinated investment in housing, social amenities, and infrastructure is essential to unlock the economic opportunities identified in Sections 7–13. A well-served built environment underpins investment confidence, job creation, and diversification.
- ▶ **Settlement formalisation and upgrading:** Upgrading informal settlements, completing bulk and reticulation networks, and addressing risk-prone areas (floodlines, dolomitic land) enable township proclamation, tenure security, and improved quality of life.
- ▶ **Housing affordability and diversity:** Expanding supply and normalising housing costs in Kathu is critical. Providing higher-density housing and long-term rental products will support a more mobile and adaptive workforce.
- ▶ **Climate resilience:** Designing infrastructure and amenities to withstand heat, flooding, and water scarcity enhances resilience while lowering long-term costs.
- ▶ **Asset renewal and stewardship:** Renewing ageing networks reduces water and electricity losses, improves operating margins, and demonstrates responsible asset custodianship.
- ▶ **Integration of settlements:** Roads, link roads, and urban upgrading can strengthen cohesion between older and newer suburbs, between mining settlements and municipal towns, and across the municipality.
- ▶ **Institutional strengthening:** The doubling of the asset portfolio demands scaled-up asset management systems, sectoral master plans, and

institutional capacity to ensure infrastructure is bankable, fundable, and sustainable.

16.4 Policy Alignment

The Composite Built Environment Framework is fully responsive to SPLUMA principles and aligned with national, provincial, and district policy frameworks.

► SPLUMA:

- *Spatial sustainability* is advanced through settlement upgrading, efficient land use, and risk-sensitive development.
- *Spatial justice* is promoted by providing affordable housing, upgrading informal settlements, and ensuring equitable distribution of social amenities.
- *Efficiency* is pursued through infrastructure-led development, value capture, and asset renewal.
- *Resilience* is embedded by adapting infrastructure and amenities to climate change and environmental risks.
- *Good administration* is reinforced through asset management planning, improved institutional systems, and integrated development processes.

► Provincial and District Alignment:

- The framework directly supports the **Northern Cape PSDF**, especially Driver 2 (*Transforming Spaces and Livelihoods*) and Driver 3 (*Conservation of Resource Production Areas*).
- It aligns with the **John Taolo Gaetsewe District IDP, District One Plan, and District SDF** particularly the priorities for settlement upgrading, infrastructure-led growth, and innovation in service provision.
- It complements the National Human Settlements Framework and sector master planning approaches promoted by DCoG and National Treasury.

16.5 Multi-Driver Synergies

The built environment interventions simultaneously support multiple PSDF drivers:

- **Thriving Economic Engines (Driver 1):** Infrastructure and housing provision underpin economic diversification by enabling investment in agriculture, mining-linked industry, renewable energy, and tourism.
- **Transforming Spaces and Livelihoods (Driver 2):** Settlement upgrading, social amenities, and affordable housing improve liveability, integration, and access to opportunities.
- **Conservation of Resource Production Areas (Driver 3):** Water conservation, recycling, and risk-sensitive land use planning safeguard critical natural resources.
- **Effective Spatial Governance (Driver 4):** Strengthened asset management, coordinated planning, and regulatory enforcement ensure efficient and accountable spatial governance.

The Composite Built Environment Framework is not only a collection of discrete projects but a coherent, multi-driver system. The table below demonstrates how the combined priorities for human settlements, social amenities, and infrastructure simultaneously advance the principles of SPLUMA and respond to the main drivers of the Northern Cape PSDF. It highlights the way in which interventions reinforce one another, achieving multi-principle alignment and unlocking multi-driver synergies that strengthen both settlement liveability and economic resilience.

16.6 Conclusion

The Composite Built Environment Framework integrates settlement development, social amenities, and infrastructure provision into a coherent, mutually reinforcing strategy. It highlights the centrality of the built environment in shaping sustainable, liveable, and resilient settlements, while enabling economic diversification and growth.

By addressing housing affordability, upgrading informal settlements, expanding social amenities, and modernising infrastructure, the framework directly enhances the quality of life of Gamagara's residents. Simultaneously, it provides the physical platform upon which the municipality's economic transformation strategy depends.

This framework is fully aligned with SPLUMA principles and provincial and district spatial strategies. It positions Gamagara to move beyond fragmented, mining-dependent settlement patterns towards a future-ready, integrated, and resilient built environment that underpins long-term prosperity and sustainability.

TABLE 10: COMPOSITE BUILT ENVIRONMENT FRAMEWORK – SUMMARY MATRIX

Framework Element	Key Actions / Interventions	SPLUMA Principles Advanced	PSDF Drivers Supported
Settlement upgrading & proclamation	Provide bulk water, sanitation, and roads to enable proclamation of Dibeng and Olifantshoek suburbs; relocate households from floodlines; manage dolomite risks	<i>Spatial justice</i> (services for marginalised), <i>sustainability</i> (risk-sensitive land use), <i>efficiency</i> (formalisation)	Driver 2: Transforming Spaces & Livelihoods; Driver 3: Conservation of Resource Areas
Housing diversification & affordability	Expand affordable housing supply in Kathu (mixed housing, higher-density, rental units) to reduce costs, accommodate transitional workforce, and reduce commuting	<i>Spatial justice</i> (equitable access), <i>efficiency</i> (housing linked to infrastructure), <i>resilience</i> (diverse housing typologies)	Driver 2: Transforming Spaces & Livelihoods; Driver 1: Thriving Economic Engines (labour mobility)
Social amenities	Provide new schools (Kathu, Dibeng), ECD centres, libraries, parks, and sports facilities; rehabilitate and repurpose existing facilities with climate-adaptive design	<i>Spatial justice</i> (equitable amenities), <i>sustainability</i> (climate adaptation), <i>resilience</i> (heat and flood adaptation)	Driver 2: Transforming Spaces & Livelihoods; Driver 4: Effective Spatial Governance
Water security	Implement GBIP and RBIG; augment bulk systems; build reservoirs and elevated storage; enforce water conservation and demand management	<i>Sustainability</i> (efficient use), <i>resilience</i> (drought security), <i>efficiency</i> (augmentation to enable growth)	Driver 3: Conservation of Resource Areas; Driver 1: Thriving Economic Engines (growth enablement)
Sanitation systems	Upgrade Kathu & Olifantshoek WWTWs; extend sewer networks to new housing projects (Kathu 5700, Bestwood, Farm 736)	<i>Sustainability</i> (safe waste disposal), <i>justice</i> (universal access), <i>efficiency</i> (infrastructure-led development)	Driver 2: Transforming Spaces & Livelihoods; Driver 1: Thriving Economic Engines
Electricity provision	Upgrade substations (Kathu, Olifantshoek); extend reticulation in new suburbs; improve resilience to vandalism	<i>Efficiency</i> (network modernisation), <i>resilience</i> (energy security)	Driver 1: Thriving Economic Engines; Driver 2: Transforming Spaces & Livelihoods
Roads & stormwater	Upgrade low-lying flood-prone roads (Olifantshoek, Dibeng); build link roads (Olifantshoek, Babatas, Sesheng); install stormwater culverts and berms	<i>Sustainability</i> (risk-sensitive), <i>resilience</i> (flood-proofing), <i>efficiency</i> (connectivity)	Driver 2: Transforming Spaces & Livelihoods; Driver 3: Conservation of Resource Areas
Solid waste management	Plan for new sites before Dibeng landfill closure; scale recycling & waste-to-value; address illegal dumping	<i>Sustainability</i> (waste minimisation), <i>efficiency</i> (circular economy), <i>justice</i> (clean, healthy settlements)	Driver 3: Conservation of Resource Areas; Driver 4: Effective Spatial Governance
Asset renewal	Replace asbestos pipes; renew water & electricity networks; rehabilitate landfills	<i>Efficiency</i> (reduce losses), <i>resilience</i> (future-proof networks), <i>sustainability</i> (resource stewardship)	Driver 3: Conservation of Resource Areas; Driver 4: Effective Spatial Governance
Institutional capacity & asset management	Develop Strategic Asset Management Plan (SAMP); strengthen systems, staff, and PMO for GBIP/RBIG; demonstrate capacity to funders	<i>Good administration</i> (evidence-based, accountable), <i>efficiency</i> (bankability)	Driver 4: Effective Spatial Governance; Driver 1: Thriving Economic Engines (investment confidence)

17. Spatial Governance Framework Development Plan

17.1 Introduction

A capable and accountable spatial governance system is critical for Gamagara to manage rapid urbanisation, mitigate the risks associated with mine closures, and unlock opportunities for post-mining economic diversification. Effective governance ensures that development is sustainable, inclusive, and aligned with SPLUMA principles, while enabling evidence-based decision-making, coordinated planning, and participatory engagement with communities and stakeholders.

17.2 Spatial Context

Gamagara is experiencing rapid growth driven by mining, industrial development, and emerging diversification sectors. At the same time, mine downscaling poses risks to long-term stability. Spatial governance must therefore balance enabling growth with managing risks.

The municipality currently faces:

- ▶ Rapid expansion of settlements.
- ▶ Pressures on infrastructure and land markets, leading to housing shortages and informality.
- ▶ Institutional challenges, including limited technical capacity, under-structured asset portfolios, and inconsistent enforcement of land use controls.
- ▶ Increasing demand for evidence-based planning and alignment with district and provincial frameworks.

A strengthened governance system is required to:

- ▶ Coordinate across sectors and spheres of government.
- ▶ Manage land strategically to enable growth while protecting resources.
- ▶ Regulate land use consistently and transparently.
- ▶ Create certainty for investors and communities.

17.3 Key Opportunities and Considerations

The evolution of Gamagara's spatial governance system, aligned with SPLUMA requirements, must respond to the municipality's current challenges while capitalising on strategic opportunities. By enhancing evidence-based decision-making, strengthening intergovernmental collaboration, and creating a predictable, investor-friendly regulatory environment, spatial governance can become a central enabler of sustainable development, resilience, and long-term prosperity.

- ▶ **Evidence-based governance:** Strengthening GIS and data systems provides a robust basis for decision-making and intergovernmental alignment.
- ▶ **Policy alignment:** Stronger alignment with PSDF, District One Plan, District IDP and District SDF, and sectoral master plans ensures coherent growth and investment.
- ▶ **Investor confidence:** Clear zoning, predictable processes, and updated by-laws create certainty for developers and investors.
- ▶ **Participatory governance:** The Regional Compact provides a platform for joint planning and should be expanded to include more stakeholders.
- ▶ **Financial resilience:** Optimising land use, applying developer contributions, and accessing a wider range of grants (e.g. NDPG) can improve funding.
- ▶ **Risk management:** Effective controls on dolomite land, flood lines, and spaza shop regulation reduce vulnerabilities and improve safety.
- ▶ **Integration:** Updated zoning and controls in the Kathu CBD and Integration Zone provide opportunities to drive compact, mixed-use growth.

17.4 Land Use Management Implications and Considerations

The review of the Municipal Land Use Management Scheme (LUMS) must be carefully structured to align zoning provisions and development controls with the MSDF's spatial vision and SPLUMA principles of spatial justice, sustainability, efficiency, and resilience. As the primary regulatory instrument for permissible land uses, densities, building heights, site coverage, and parking requirements, the LUMS needs to be updated to both correct historic anomalies and enable the municipality's forward-looking spatial strategies.

Key implications and considerations include:

1. **Urban Development Boundaries (UDBs):** Amend zoning provisions to ensure compliance with updated UDBs, restricting urban expansion beyond designated limits.
2. **Urban Development Zones (UDZs):** Incorporate the proposed UDZs in the Gamagara LUMS.
3. **Sesheng–Mapoteng–Kathu Integration Zone:** Introduce zoning categories and controls to promote higher-density residential, mixed-use, and integrated development, while managing environmental constraints.
4. **Kathu CBD Precinct Plan:** Align zoning with the precinct plan by encouraging intensification, mixed-use activity, and high-quality public space activation.
5. **Institutional land:** Adjust zoning to increase the supply of land for schools, clinics, cemeteries, and other public services identified as insufficient in the MSDF Phase 3 analysis.
6. **Township deproclamation:** For settlements identified for deproclamation in high-risk flood-prone areas (e.g. Olifantshoek), amend existing residential zonings to appropriate alternatives such as Public Open Space, thereby formalising risk-sensitive land use.
7. **Residential zoning:**
 - ▶ Prohibit further **Residential IV zoning**, which has enabled unregulated informal business activity.
 - ▶ Expand **Residential III zoning** to provide for higher-density and more affordable housing typologies.
8. **Informal businesses:** Introduce consistent zoning provisions across all settlements to regulate spaza shops and informal businesses, ensuring compliance with health, safety, and urban design standards.
9. **Dolomite land:** Update zoning and overlays to apply a Dolomite Risk Management Strategy, ensuring that development intensity and permissible uses are tied to risk categories in line with SANS 1936.
10. **Settlement upgrading:** Where in situ upgrading of informal settlements is confirmed through geotechnical studies, introduce appropriate zoning categories (e.g. Residential I–III, Mixed Use, or Special Use) to formalise development rights and enable service provision.

17.5 Spatial Guidance and Governance Directives

The implementation of the MSDF depends on clear, enforceable directives that translate SPLUMA principles into practice. These directives must ensure that planning, land use, infrastructure, and governance are integrated, evidence-based,

and responsive to local realities. They provide the mechanisms through which Gamagara can strengthen institutional capacity, safeguard ecological and economic assets, and enable inclusive, well-managed growth across its settlements.

1. Evidence-based planning and decision-making

- ▶ Enhance GIS capabilities, maintain up-to-date cadastre and zoning records, and monitor development trends.
- ▶ Require developers and consultants to provide spatial data for integration into municipal systems.
- ▶ Share evidence with district, provincial, and mining partners.

2. Intergovernmental and participatory governance

- ▶ Support and participate in district/provincial spatial planning forums.
- ▶ Strengthen and expand the Mine-Municipal Compact.
- ▶ Create mechanisms for continuous coordination with mining companies.

3. Integrated strategic planning

- ▶ Maintain credible instruments, including human settlement plans, precinct plans, sectoral master plans, and LED strategies.
- ▶ Involve stakeholders in plan development and ensure transparency.

4. Investor-friendly institutional environment

- ▶ Publish an investment atlas and customer charter.
- ▶ Benchmark tariffs, update by-laws, and enforce urban design and developer contribution policies.
- ▶ Implement an electronic land development processing system.

5. Revenue and financial resilience

- ▶ Optimise land markets and built environment revenues.
- ▶ Introduce investment decision-support systems.
- ▶ Adopt the MSDF as the primary capital investment framework.

6. Investment sourcing and partnerships

- ▶ Maintain project cost and job creation databases.
- ▶ Leverage multiple funding sources (grants, SLP, SED, DFIs).
- ▶ Ensure institutional readiness for grants.

7. Infrastructure governance

- ▶ Align projects with the Capital Expenditure Framework.
- ▶ Strengthen procurement, project tracking, and asset transfer systems.

8. Resilient settlements and land governance

- ▶ Enforce by-laws and conduct regular land audits.
- ▶ Manage land invasions proactively, especially on earmarked sites and within flood lines or servitudes.

TABLE 11: SUMMARY MATRIX OF SPATIAL GOVERNANCE DIRECTIVES

Focus Area	Directive	Intended Outcome	PSDF Drivers Supported	SPLUMA Principles Advanced
Evidence-based planning	Strengthen GIS, maintain updated cadastre, integrate developer data, and monitor growth trends	Transparent, accurate, and aligned decision-making	Driver 4: Effective Spatial Governance	<i>Good administration, Efficiency</i>
Intergovernmental governance	Expand the Mine-Municipal Compact; participate in district/provincial forums; create mechanisms for ongoing alignment with mines	Stronger intergovernmental alignment and participatory governance	Driver 4: Effective Spatial Governance	<i>Good administration, Spatial justice</i>
Integrated planning	Maintain credible instruments (MSDF, LUMS, precinct plans, sectoral master plans); ensure multi-stakeholder participation	Coherent, synchronised municipal strategies and credible long-term planning	Driver 2: Transforming Spaces and Livelihoods; Driver 4: Effective Spatial Governance	<i>Efficiency, Good administration, Sustainability</i>
Investor environment	Publish investment atlas and charter; benchmark tariffs; update by-laws; introduce electronic development processing	Certainty, efficiency, and improved investor confidence	Driver 1: Thriving Economic Engines; Driver 4: Effective Spatial Governance	<i>Efficiency, Good administration</i>
Financial resilience	Optimise land markets and revenues; implement decision-support systems; adopt MSDF as primary capital framework	Improved financial sustainability and capacity to deliver	Driver 1: Thriving Economic Engines; Driver 4: Effective Spatial Governance	<i>Efficiency, Sustainability</i>
Investment partnerships	Leverage grants (MIG, RBIG, NDPG), mine SLP/SED funds, DFIs; maintain readiness for funding applications	Expanded capital inflows, accelerated project delivery, and shared responsibilities	Driver 1: Thriving Economic Engines; Driver 4: Effective Spatial Governance	<i>Efficiency, Good administration</i>
Infrastructure governance	Align projects with CIF/IDP; strengthen procurement, monitoring, and asset transfer processes	Predictable and efficient project implementation	Driver 1: Thriving Economic Engines; Driver 4: Effective Spatial Governance	<i>Efficiency, Good administration</i>
Settlement resilience & land governance	Enforce by-laws; conduct land audits; regulate spaza shops; manage dolomite/flood risks; act against land invasions	Safer, more resilient and orderly spatial form; protection of people and assets	Driver 2: Transforming Spaces and Livelihoods; Driver 3: Conservation of Resource Production Areas; Driver 4: Effective Spatial Governance	<i>Resilience, Spatial justice, Sustainability, Good administration</i>

The Spatial Governance Framework is not only about institutional arrangements and regulatory processes, but also about how these systems give effect to higher-level policies and principles. **Table 11** on the previous page demonstrates how Gamagara’s governance directives align with the PSDF drivers and advance the SPLUMA principles. This alignment ensures that governance reforms are not pursued in isolation but actively support the transformation of spaces, the conservation of resource areas, the strengthening of economic engines, and the pursuit of effective, accountable spatial governance.

17.6 Conclusion

The Spatial Governance Framework Development Plan provides the institutional and regulatory foundation of the MSDF. By strengthening evidence-based planning, intergovernmental coordination, and the land use management system, Gamagara will be better positioned to manage growth, mitigate risks, and enable sustainable, inclusive development.

The review of the LUMS is central to this process, ensuring that zoning, development controls, and land allocations actively give effect to the municipality’s spatial proposals — from the Kathu CBD Precinct to the Sesheng–Mapoteng–Kathu Integration Zone. In doing so, Gamagara positions itself as a municipality with the governance capacity to not only manage post-mining transitions but also to secure a resilient, future-fit spatial form that supports inclusive economic growth and improved quality of life.

18. Integrated Spatial Development Framework

18.1 Introduction

This section consolidates all framework development plans into a single, integrated spatial development framework for Gamagara. It demonstrates how the Spatial Structuring, Biophysical, Economic, Built Environment, and Spatial Governance frameworks converge into one composite vision for the municipality.

Integration is demonstrated by showing:

- ▶ how each framework contributes to the realisation of the spatial vision and objectives;
- ▶ how these frameworks collectively align with and give effect to SPLUMA principles and PSDF drivers; and
- ▶ how, through implementation, the frameworks reinforce one another to deliver outcomes and impacts greater than the sum of their parts.

In this way, Section 18 confirms the coherence of the MSDF, offering a consolidated roadmap to guide Gamagara's transition towards a diversified, inclusive, and future-fit spatial and economic system.

18.2 Integration Across Frameworks

The frameworks developed in preceding sections are deeply interlinked and mutually reinforcing.

- ▶ **Spatial Structuring Framework** provides the overall form and logic for growth: nodes, corridors, integration zones, and urban development boundaries.
- ▶ **Biophysical Framework** embeds environmental stewardship, climate resilience, and natural asset restoration at the heart of development.
- ▶ **Economic Frameworks** identify diversified growth sectors — agriculture, tourism, renewable energy, mining and manufacturing, wholesale and retail trade, and education and finance — brought together in a Composite Economic Framework that drives transition beyond mining.
- ▶ **Built Environment Frameworks** integrate human settlements, social amenities, and infrastructure, consolidated in a Composite Built Environment

Framework that ensures liveability, connectivity, and infrastructure-led growth.

- ▶ **Spatial Governance Framework** is not merely a regulatory backbone for compliance but a critical enabler and driver of development, creating the institutional, policy, and land use conditions required to realise the spatial vision.

Together, these frameworks produce a coherent, future-oriented MSDF that integrates space, economy, environment, society, and governance into a unified strategy.

18.3 Policy Alignment

The integrated spatial development framework is fully responsive to, and aligned with, higher-order legislation, policies, and strategies identified in the MSDF Phase 2 Report.

- ▶ **National:** It advances the priorities of the National Spatial Development Framework (NSDF) by positioning Gamagara within the North-Western Transformation Corridor and strengthening compact, resilient settlements.
- ▶ **Provincial:** It responds directly to the Northern Cape PSDF, supporting its four drivers — Thriving Economic Engines, Transforming Spaces and Livelihoods, Conservation of Resource Production Areas, and Effective Spatial Governance.
- ▶ **District:** It aligns with the John Taolo Gaetsewe District One Plan, IDP and SDF, particularly with respect to economic diversification, human settlement upgrading, and infrastructure-led growth.
- ▶ **Local and sectoral:** It is further informed by, and aligned with, the Gamagara IDP (municipal vision and strategic objectives), draft LED Strategy, the Kathu CBD Precinct Plan, and sectoral strategies and plans.
- ▶ **Legislation:** Across all frameworks, the MSDF gives effect to the principles of SPLUMA — spatial justice, spatial sustainability, efficiency, spatial resilience, and good administration.
- ▶ **Inter-municipal alignment:** The development of the spatial proposals for Gamagara has been closely coordinated with the preparation of spatial proposals for Tsantsabane Local Municipality, ensuring that interventions in the two municipalities are complementary, mutually reinforcing, and regionally coherent within the Gamagara–Tsantsabane mining corridor and the broader Gamagara Spatial Action Area.

18.4 Key Outcomes of Integration

The integrated framework delivers a set of outcomes that directly reinforce the spatial objectives and vision of Gamagara. In Section 2, a Table 1: GLM Spatial Objectives Alignment Matrix demonstrated how Gamagara’s objectives align with SPLUMA and PSDF. In this final section, we extend that logic by showing how the various frameworks support these objectives, how they reinforce PSDF drivers and SPLUMA principles, and how implementation will result in measurable outcomes (see **Table 12** on the following page).

18.5 Conclusion

The Integrated Spatial Development Framework provides a single composite vision for Gamagara’s future: a diversified economy, sustainable and integrated settlements, resilient infrastructure, protected ecological systems, and accountable governance.

By demonstrating how sectoral and thematic frameworks reinforce one another, this section shows that the MSDF is more than the sum of its parts: it is a coherent, mutually reinforcing system that can guide Gamagara through mine transition into a future-fit, resilient, and inclusive municipality.

Implementation will be taken forward in MSDF Report 5: the Capital Expenditure Framework and Implementation Plan, where priorities, phasing, and financing strategies are detailed.

TABLE 12: FRAMEWORK INTEGRATION, OBJECTIVES AND OUTCOMES ALIGNMENT MATRIX

GLM Spatial Objectives	Supporting Frameworks	PSDF Drivers Advanced	SPLUMA Principles Advanced	Likely Outcomes
1. Diversify the economy beyond mining	Economic frameworks (Agri, Tourism, Renewable Energy, Manufacturing & Trade, Finance); Built Environment (infrastructure to enable growth)	Thriving Economic Engines	Efficiency, Resilience	Expanded economic base, reduced dependence on mining, net job creation
2. Enable sustainable, integrated settlements	Human Settlements & Social Amenities; Infrastructure; Spatial Structuring	Transforming Spaces and Livelihoods	Spatial justice, Efficiency, Sustainability	Upgraded townships, affordable housing, integrated settlement patterns
3. Protect and restore environmental assets	Biophysical Framework; Agriculture (invasive species valorisation, biochar); Infrastructure (asset renewal, stormwater resilience)	Conservation of Resource Production Areas	Sustainability, Resilience	Improved water security, climate-adaptive settlements, biodiversity reserves
4. Ensure infrastructure-led development	Infrastructure Framework; Built Environment composite	Thriving Economic Engines; Transforming Spaces	Efficiency, Sustainability	Bulk water augmentation, upgraded sanitation, resilient roads, reliable electricity
5. Enhance governance capacity and transparency	Spatial Governance Framework (LUMS, GIS, institutional strengthening, Compact)	Effective Spatial Governance	Good administration, Justice, Efficiency	Predictable processes, investor confidence, coordinated governance
6. Build social and human capital	Human Settlements & Social Amenities (schools, ECDs, parks, sports); Education & Training	Transforming Spaces and Livelihoods	Spatial justice, Resilience	Improved education access, youth development, safer and more liveable communities
7. Position Gamagara as a regional hub	Spatial Structuring; Economic frameworks (Trade, Finance); Infrastructure (air, rail, roads)	Thriving Economic Engines; Effective Spatial Governance	Efficiency, Sustainability	Kathu as regional service hub, strengthened logistics and connectivity