

# Chapter 3

## Exploring Nelspruit as a Historical Spatial Jigsaw Corridor-Based Secondary City: A Spatial Governance Geographical Perspective



James Chakwizira

**Abstract** Nelspruit secondary city is the economic hub of Mpumalanga province under the authority of Mbombela Local Municipality (MLM). Located along the N4 corridor, Nelspruit links Johannesburg, Pretoria, Mozambique and Swaziland. Nelspruit is an expanding city sandwiched in a tourism region. With rapid urbanisation and the implementation of post-1994 apartheid reversal policies, the challenge of managing expanding peri-urban settlements is emerging. Mbombela Local Municipality includes the former Transitional Local Councils of Nelspruit, White River and Hazyview as well as the Transitional Rural Councils of Nelspruit and Nsikazi. Consequently, Nelspruit city reveals a divided urban structure consisting of a previously well-serviced ‘white’ developed core (i.e. White River, Nelspruit and Hazyview) that is surrounded by an under-serviced ‘black’ outer urban and peri-urban periphery (i.e. Matsulu, Kanyamazane, Daantjie, Kabokweni and Nsikazi area). Despite recent improvements such as N4 corridor by-pass, R40 upgrade and proposed bus rapid transport (BRT) routes, the urban housing, industrial, commercial, peri-urban and transport systems remain inefficient. Making use of a transit-oriented development theory and approach, Nelspruit’s urban development opportunities are highlighted while constraints are discussed. It is concluded that Nelspruit’s development model can better integrate land use and transport corridor dividends for enhanced growth of its core and immediate environments. This requires a strengthening of the urban housing, transportation and spatial development frameworks and institutions so that a (new) appropriate, adaptable and resilient system set-up is anchored and reproduced at all scales, places and cultures and over time for inclusive outcomes, outputs and products.

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### 3.1 Introduction

Mbombela (formerly Nelspruit) is the proclaimed capital of Mpumalanga province since 1994. Historically, the City of Mbombela was established on the advent of the Eastern Railway Line in South Africa. The origin of the name Nelspruit is derived from the three Nel Brothers, Gert (1844–1932), Louis (1846–1919) and Andries (1855–1933), who settled in the Lowveld area from the Highveld between 1883 and 1896 in search of a better agricultural environment specifically to support their sheep and cattle (Bornman 2017).

Mbombela is an outcome of developmental local government agenda which saw the amalgamation of former Umjindi and Mbombela Local Municipalities in 2016 (Mokoena 2017; Ncube and Monnakgotla 2016). The amalgamation was in compliance with and a logical conclusion to the final decision of the Municipal Demarcation Board (MDB) which re-determined some municipalities in South Africa into amalgamated entities (Jeeva et al. 2022). Amalgamation was used as a mechanism to steer the two former municipalities towards financial viability and sustainability (Jeeva and Cilliers 2021). In addition, amalgamation was meant to serve the implementation of spatially effective and efficient local governance systems, adept at responding to, and delivering on their core mandate in tandem with stakeholder expectations. Before amalgamation, Umjindi Local Municipality comprised of eighteen (18), while the former Mbombela Local Municipality had seventy-eight (78) councillors. After amalgamation, Mbombela Local Municipality now comprises ninety (90) councillors. The merger of Mbombela and Umjindi Local Municipalities was guided and implemented in terms of Sections twenty-four (24) and twenty-five (25) of the Municipal Demarcation Act (Act No. 27 of 1998) and Section two (2) of the Municipal Structures Act (Act No. 117 of 1998).

Mbombela (formerly Nelspruit) is a classic example of an expanding contemporary city in an extended tourism geographical region. It has growing peri-urban settlements that have been incorporated into the city boundaries after the local elections in 2000 (Marais and Cloete 2017). Invariably, Mbombela displays spatialised and institutionalised apartheid legacies. The dual structure projects the persistence of previously *white* developed urban spatial core and enclosure, with better services and multiple opportunities for livelihood enhancement. The outer poverty enclave is comprised of fragments and peels of peri-urban settlements that historically experience service delivery backlogs, deficits and constraints (Chakwizira 2019). These problems are superimposed onto an urban land tenure system that frowns at informal and customary land administration, tenure systems and rights present in traditional areas within the Mbombela municipal area.

Generally, studies of secondary cities focus on their economic role in managing urbanisation (Marais and Cloete 2017; Marais et al. 2016) including challenges of mining decline or boom (Marais et al. 2021), policy directions for spatial transformation (Moffat et al. 2021), role of data and technology (Ranchod 2020), urbanity, power and moments of political aspiration (Ammann et al. 2022) in the spatial (r) evolution of the areas. However, the current study's departure point is locating Nelspruit as a historical spatial jigsaw piece within a corridor-based secondary city making use of a spatial governance geographical perspective. Understanding and exploring the notion and concept of a spatial jigsaw for this study is important. Granted the lack of prior scientific work that defines a spatial jigsaw, the author saw merit in developing a framing definition, notion and concept. The Cambridge dictionary defines a jigsaw '*as a complicated or mysterious problem that can only be solved or explained by connecting several pieces of information*' (Cambridge Dictionary 2013).

In this chapter, therefore the notion and concept of a *spatial jigsaw* refers to the existence of a multi-layered, multi-scaled and spatially complicated governance system that requires systems analysis in seeking to understand the linkages and relations between space, place, time, history and culture in respect of the spatial evolution, growth and development of the City of Mbombela in South Africa. The main argument advanced is that in the absence of a spatial jigsaw analytic approach, understanding the drivers of change, change agents and spatial transformation struggles in Mbombela will be incomplete. Consequently, the study furthermore discusses intersections and nested layers of secondary cities' intertwined spatial planning, change and transformation matters (Marais and Nel 2019) and places emphasis on the city's growing and expanding influence on a booming tourism base. This chapter expands on the work by Campbell (2019) by incorporating other spatial governance and development moments that have happened in Mbombela (Nelspruit) with a view to interpret the emerging spatial signatures. The spatial structure and form of the area informs the spatial development scenarios that are highlighted within the context of complex drivers for change and continuity in the municipal area.

This chapter therefore seeks to achieve the following:

1. Locate the Nelspruit case within the confines of a spatial divide and corridor development debates in local government.
2. Explore post-apartheid urban growth and drivers of change levers in the study area.
3. Assess the potential of applying transit-oriented development theory in understanding and addressing spatial and travel distance constraints in Nelspruit (i.e. fostering the spatial integration of the ex-white and peri-urban areas into 'one city').
4. Discuss possible ways of solving the inherited spatial growth and urban development inefficiencies in the study area.

The chapter is structured into *six* sections. *Section one* has presented the introduction, background, case study, study methodology and purpose of the manuscript. *Section two* reviews the historical perspective and context of Mbombela as a secondary city. *Section three* contains an analysis on building a capable municipal local governance system in the City of Mbombela. *Section four* discusses the municipal governance, planning and management of the secondary city. *Section five* comprises a discussion and synthesis to the manuscript, while *section six* presents the chapter's conclusion.

## 3.2 Contextualisation of the Case Study

Apartheid in South Africa crafted legacy moments in spatial division, social segregation and economic enclaves that located low-income earners in marginal areas dislocated from economic hubs and nodes of advancement (Maharaj and Narsiah 2002). Consequently, carry-over spatial planning and geographical disconnections and discontinuities keep challenging the new democratic government's intent to overcome spatial fragmentation, manage unplanned urban sprawl and address multiple layers of produced informalities in the spatial landscape. Investment in marginal communities, townships, peri-urban and rural areas has continued to be inadequate and of limited impact. The quest to achieve spatial economic justice and redistribute flows, materials and goods for improved inclusive access and livelihoods in both urban and rural areas (Schoeman 2018) has thus been frustrated.

The distance, time and cost paradox for urban commuting is a universal problem that is not peculiar to South Africa (Hirte and Illmann 2019; Randall et al. 2023; Stutzer and Frey 2008; Tao et al. 2023). Ways to increase mobility and access and enhance affordability by governments include a repertoire of measures that include use of public transport subsidies, spatial planning and design towards compact and dense and transit-oriented urban systems as well as tactical urbanism (including urban acupuncture). These are aimed at creating the right densities to support urban public transport at specific points, nodes and corridors. They are also meant to balance the economic, social and environmental objectives of sustainable human settlements and development. In this light, the apartheid government adopted a classical method with the momentary twist of segregation philosophy. Spatial direction of investments and developments was done in a skewed and spatially inefficient and unjust manner for most South Africans. Thus, public transport subsidies in South Africa were targeted at bus and rail operators in order to ensure easy access, movement and circulation of low-income earners from places of residence that were located far away from areas of work and opportunities (Henseler and Maisonnave 2018; Khosa 2017; Khosa 1998). This spatial history provides an appropriate context for exploring Nelspruit as a spatial jigsaw corridor-based secondary city making use of the spatial governance lenses of analysis.

### 3.3 Methodology

The chapter makes use of a case study of Nelspruit city. A case study approach modelled according to Yin (2009) allows for a detailed analysis and exposition of a case study area (Aberdeen 2013; Piekkari and Welch 2018; Yin 2009). The unit of analysis is the Mbombela city spatial landscape. Another advantage of the case study method is that it enables a researcher to answer the question on how or why spatial governance architecture and forms have transformed or not during the period under investigation. Desktop and secondary datasets from Mbombela municipal integrated development plans (IDPs), local economic development (LED) plans and the spatial development frameworks (SDFs) as relevant and available from 2000 to 2022 were reviewed to facilitate contextual interpretation and relevance of findings. In addition, the following documents and datasets were accessed and analysed: Service Delivery and Budget Implementation Plan (SDBIP) quarterly reports, Stats SA Community Survey 2016 and Stats SA 2000 and 2011 census reports. Key spatial and growth thematic focus areas that were selected for detailed investigation and analysis included population structure and dynamics and settlement form and structure and growth and development trends. Selected key informants were held with officials from the following municipal departments. The data sources accessed and analysed included documentation, archival records, key informant interviews, direct observation, participant observation and physical artefacts. A thematic approach is employed in exploring the key factors of spatial change, growth, governance, continuity and discontinuities in the study area. The outcome of the synthesis constitutes this chapter.

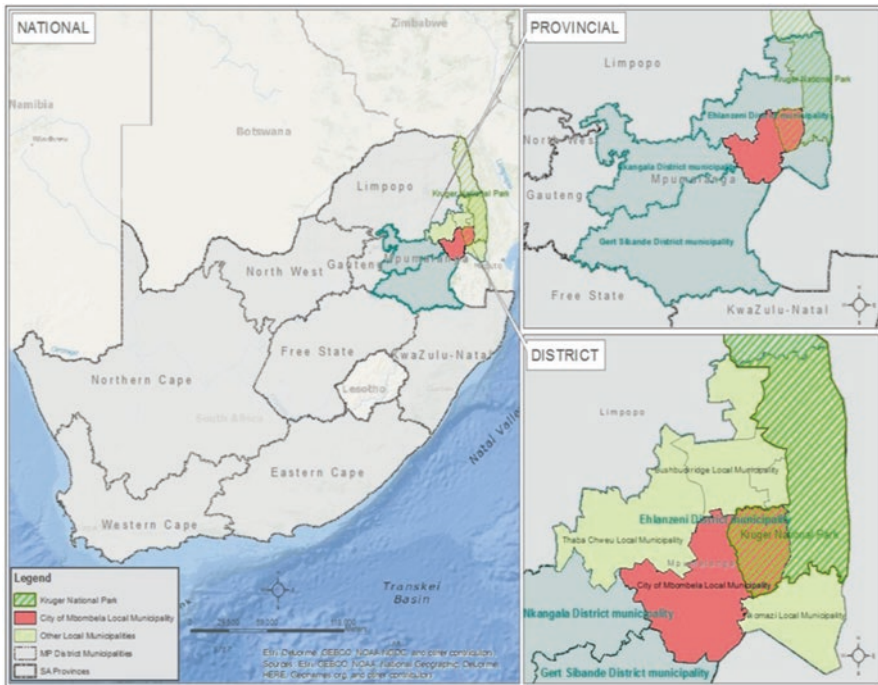
The chapter adopts a two-pronged theoretical framework that is fed by two main anchoring theories, namely, spatial governance and complexity theory. Spatial governance is wider than government and includes the private sector, non-governmental organisations (NGOs), community-based organisations (CBOs) and various layers of formal and informal institutions interested and working in any spatial setting (Chakwizira and Mashiri 2009). In this chapter, spatial governance theory is conceived as a *whole of government approach plus* in seeking to engage, convert and reduce urban spatial and development problems into sustainable and inclusive solutions that address the needs of all urban citizens, i.e. children, youths, women, aged, persons with disabilities and minority/marginalised and peripheral groups (Pierre 2014). This includes juxta positioning of new and old imaginaries of spatial governance and re-imaging with a view to implanting spatial transformation moments and images for change. Dimensions of spatial governance included in this chapter are public transport spatial governance, human settlement spatial governance and institutional spatial governance.

On the other hand, the adoption and use of the complexity theory relevant to the study was predicated on the premise that spatial planning and urban planning by extension are happening in the context of an increasingly globalising, rapidly urbanising and changing, complex, uncertain, networked urban and rural interdependent

world cities' system of systems (Chettiparamb 2019). According to Luhmann (2006), extension of system theory and application in respect of infusing closed systems, open systems and attaching *observing or self-referential systems* is also a critical component incorporated in the analytical approach for completeness.

### 3.4 Case Study Area Description

The City of Mbombela is in the Ehlanzeni District Municipality, Mpumalanga province, South Africa (refer to Fig. 3.1). It was established in terms of Section 12 of the Municipal Systems Act (2000) by the Member of the Executive Council (MEC) for Cooperative Governance and Traditional Affairs in Mpumalanga after the disestablishment of two municipalities, Mbombela Local Municipality (MP322) and Umjindi Local Municipality (323), in 2016. Mbombela city is situated in the north-eastern part of South Africa within the Lowveld sub-region of the Mpumalanga province. The metropolitan areas of Pretoria and Johannesburg are located 320 km inland, with the border post at Komatipoort approximately 120 km to the east and the Mozambican coastline being around 200 km away and 55 km from the Kruger National Park.



**Fig. 3.1** Location map of City of Mbombela, Mpumalanga Province, South Africa. (Source: City of Mbombela 2021)

Consequently, the City of Mbombela is a major stopover point for tourists travelling to the Kruger National Park and to Mozambique. The municipality is also bordered by Swaziland, situated 167 km from the central business district (CBD), and 127 km from Barberton. Urban areas within the municipality include Mbombela, White River, Hazyview and Barberton as well as former homeland towns such as Kabokweni, Kanyamazane and Matsulu. From an aviation perspective, the city has two airports, Kruger Mpumalanga International Airport to the northeast and the general aviation Mbombela Airport to the south-west. Kruger Mpumalanga services flights to Johannesburg and Cape Town and other regional cities and destinations in the Southern African region.

### 3.5 Historical Perspective and Context of the Secondary City

This section highlights the main issues that have played a role in the development of the town. This is in terms of the relationships and outcomes vis-à-vis demographic and population in respect of the spatial land uses and changes in the City of Mbombela. Discussions with respect to how the city has responded to the changing world of planning are also highlighted.

#### 3.5.1 Land Use, Spatial Form, Structure and Geography of the City of Mbombela

The land use patterns of urban and rural areas are mostly influenced by a diverse set of factors, which include climate, topography and resource base in the area such as minerals, soils, etc. The broader land use patterns that occur within the City of Mbombela are categorised into natural elements, primary economic activities and human settlements as indicated in Table 3.1.

From Table 3.1, natural elements dominate the total land cover within the Mbombela municipal area with 543,680 ha. It is followed by the primary economic activities that take place within the municipal space. Human settlements constitute 23,591 ha. On the other hand, the current spatial structure of the City of Mbombela is dictated by various spatial structuring elements and settlement status (hierarchy) with associated economic base. The spatial structure that currently defines the City of Mbombela can be summarised in terms of the following dominating elements:

**Table 3.1** Land use patterns

Category	Total land cover (ha) – 2014
Natural elements	543,680
Primary economic activities	146,732
Human settlements	23,591

Source: City of Mbombela Spatial Development Framework (2019)

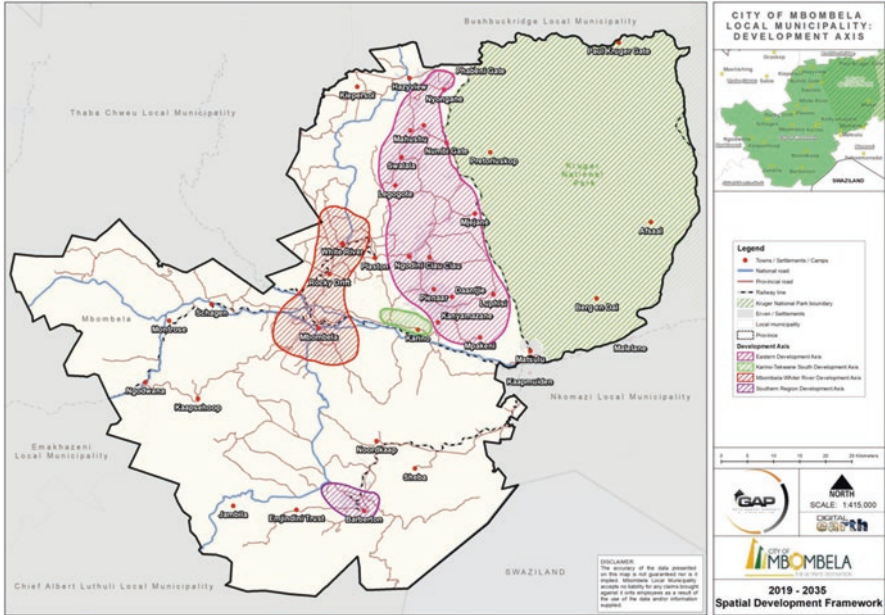


Fig. 3.2 City of Mbombela Four-Development Axis. (Source: City of Mbombela Spatial Development Framework, 2019)

- Central business districts (primary municipal nodes).
- Secondary nodes.
- Mining settlements.
- Rural settlements and rural service centres.

In brief, the spatial manifestation of the municipality expresses itself along four axes of development patterns (refer to Fig. 3.2). These four axes strategically spread across all regions of the municipality. These are discussed briefly hereunder as follows:

- *The Eastern Development Axis:* This consists of a broad belt of urban and semi-urban settlements, stretching from Hazyview in the northern region to Kanyamazane in the eastern region. This development axis is characterised by several settlements that exist within the eastern and northern regions of the municipality. These spatially inefficient settlements are characterised by a lack of economic and social opportunities, long distances between residence and work or shopping places and insecure forms of land tenure. In addition, the settlements are rapidly growing towards each other in a formal or informal and uncoordinated manner with the result being the formation of a continuous urban agglomeration with little remaining open space.
- *Mbombela–White River Development Axis:* The Nelspruit–White River Development corridor comprises of Road P9–2 (R40), which includes Nelspruit CBD, the Nelspruit industrial-cum-commercial areas, Riverside



Park industrial area, Riverside Mall, the Provincial Government office complex, Rocky Drift and White River. The residential areas of Nelspruit and White River are also included. Settlements in the western part have opposite characteristics to the settlements in the east. Rigid town planning schemes, assured zonings that provide for definite land uses within certain zones, thereby controlling development in these areas. Due to the uniformity provided by these zonings, a set standard of development is achieved in terms of scale and quality.

- *Karino–Tekwane South Development Axis:* The Karino–Tekwane South Development Axis occurs along the Kanyamazane Road (D2296) and forms an anchor point for the growing urban expansion area of the City of Mbombela. This development axis was the result of a trickledown effect associated with the development of the Karino Lifestyle Estate and the unavailability of strategic land for residential development around the Nelspruit area. The Karino–Tekwane Development Axis is characterised by ongoing residential, commercial, institutional and other urban development, as well as the proposed Mega Urban Hub.
- *Southern Region Development Axis:* The Southern Region Development Axis is characterised by the Barberton/Emjindini as a major urban development node within the area consisting of various business centre and residential areas with a disparate settlement pattern. Development within this region has been very limited; however, pockets of urban and semi-urban development including continuous residential development have occurred over the years in the areas around Phumula and Emjindini Ext 12 towards Selapi along the R40 and R38 corridors.

In addition, open spaces in the City of Mbombela Open Space are predicated on geophysical features, natural resources and cultural landscapes which also accommodates the associated cores and buffers. The following types of open spaces found in the City of Mbombela include biodiversity areas; river corridors; ridges and mountainous areas; natural heritage sites; public parks; and nature reserves. However, to population growth and pressures, some of the above-mentioned types of open spaces are being compromised due to uncontrolled developments and informal settlements.

From Fig. 3.2, the following realities emerge:

- Nelspruit is the most important settlement within the hierarchy of settlements as it provides most central functions and has the greatest sphere of influence. Nelspruit has a high dependence on surrounding areas for resource inputs.
- White River, Hazyview and Barberton perform a secondary role to Nelspruit as employment centre and residential area and fulfil a sub-regional role with respect to the provision of central functions. These nodes depend on Nelspruit for specialised goods and services.
- The main economic activity in the eastern areas is taking place at Kanyamazane CBD, Kabokweni and Matsulu. Commercial activities in Swalala, Msogwaba and Daantjie are located along the main routes. These areas are characterised by

low levels of formal local economic activity and high dependence on higher-order settlements for specialised goods and services.

- Several rural villages in the eastern part are supported by subsistence crop production and livestock farming with no other economic base. These rural communities depend on nearby service centres where they can access day-to-day services.

### 3.5.2 Population Growth and Demographics in the City of Mbombela

There are approximately 712,578 people at Mbombela. Table 3.2 indicates that over a 5-year period between 2015 and 2020, City of Mbombela's (CoM's) population rate increased by 1,55%.

According to the Community Survey 2016 conducted by Stats SA, the population of the City of Mbombela was estimated to be 695,913. This population constitutes 39.6% of the entire population of Ehlanzeni District. The City of Mbombela has recorded an annual population growth rate of 2.3% per annum between 2001 and 2011 (StatsSA 2011). However, between 2011 and 2016, an annual population growth rate of 1.2% was observed. The projected population of the city for the year 2030 is estimated to be 956,877 as indicated in Table 3.3.

In respect to population distribution, the larger portion of Mbombela's population live in peri-urban and rural areas. About 75% of the people live within communal areas on the eastern axis of the City which is far from the economic centres. CoM has the highest population density compared to Mpumalanga and Ehlanzeni Districts. Table 3.4 indicates that over the 5-year period, CoM's density increased from 77 to 81 people per square kilometre in 2020.

The increase in the density could be attributed to a process of natural urbanisation and possibly people migrating into the city. At a policy level, there is a probability that CoM's spatial development objectives of densification, compact development and infill paying off. Figure 3.3 presents the City of Mbombela population density map.

**Table 3.2** Population growth, 2015–2020

Entity	2015	2016	2017	2018	2019	2020	Growth rate
Mpumalanga	4,333,048	4,395,729	4,463,614	4,535,772	4,609,223	4,679,786	1,55%
Ehlanzeni	1,749,217	1,763,030	1,779,974	1,797,469	1,814,211	1,828,739	0,89%
City of Mbombela (CoM)	681,755	687,619	695,665	703,102	709,423	712,578	0,89%

Source: Quantec Easydata (2021)

**Table 3.3** Total population

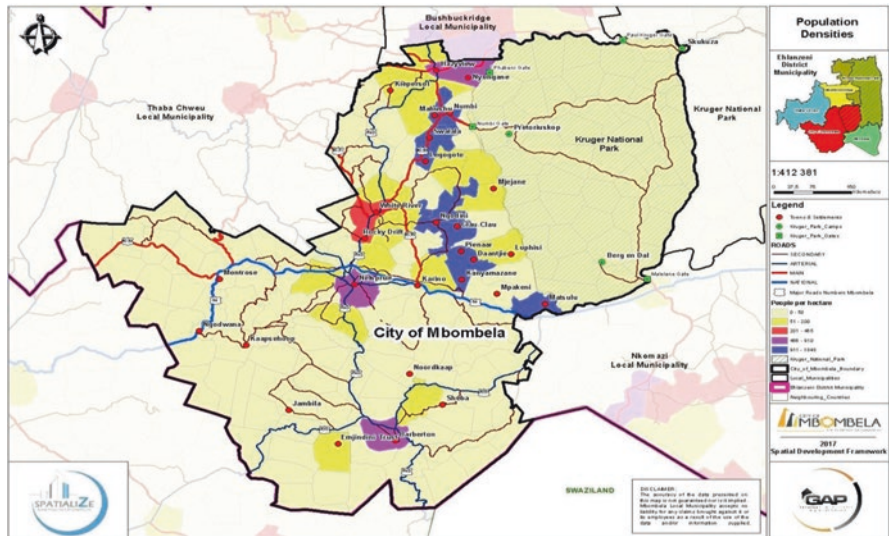
Year	2011	2016	2030	Growth rate
Total population	655,950	695,913	965,877	2.4%

Source: Statistics South Africa (2011, 2016)

**Table 3.4** Population densities, 2015–2020

Year	Mpumalanga	Ehlanzeni DM	CoM
2015	57	63	77
2016	57	63	78
2017	58	64	79
2018	59	64	80
2019	60	65	80
2020	61	66	81

Source: Quantec Easydata (2021)



**Fig. 3.3** City of Mbombela population density map. (Source: City of Mbombela Spatial Development Framework 2019)

### 3.5.3 Population Growth and Dynamics in the City of Mbombela

The City of Mbombela has grown considerably due to its status as a capital city and provincial administration of Mpumalanga. With the recent amalgamation of the former Umjindi and former Mbombela Local Municipalities, the city is expected to grow rapidly and heading towards a Metropolitan Status. The growth of the city resulted in

demand for urban land around the main economic centres, i.e. White River, Nelspruit, Hazyview and Barberton. Development pressure within the municipality is evident in the four axes of development in the area. Firstly, in the Mbombela–White River Development Axis, it is in terms of business and commercial development along the R40. In addition, the provision of affordable housing nearer to places of employment is widespread in the axis. Complementary to this, the provision of roads and engineering infrastructure to support these developments is also a common typical spatial and non-spatial development that manifests in the axis.

Secondly, development pressure is exerted on the *Eastern Development Axis*. This can be explained in terms of the following factors: the unmanaged influx of people into the area; unstructured settlement patterns; the lack of employment within proximity of residential areas; urban and rural decay; disparate provision of social, economic and engineering infrastructure; and a poorly developed road and transportation system. Thirdly, development pressure is exerted along the *Karino–Tekwane South Development Axis*. *This spatial pressure is a result of the urban expansion in the area under the jurisdiction of the City of Mbombela as well as the outcome of the ongoing residential, commercial, institutional and other urban developments.*

Fourthly and lastly, development pressure is exerted in the *Southern Region Development Axis*. The Southern Region Development Axis is characterised by the Barberton/Emjindini as a major urban development node within the area consisting of various business centres and residential areas. Recently submitted and approved land development applications (from year 2012 to 2023) give an indication of the development pressures in the municipality. Many applications for rezoning are clustered in and around economic centres such as Barberton, Nelspruit, Rocky Drift, White River and Hazyview and other expansion areas such as Nelspruit extension, Riverside Park extension 24, Sonheuwel Township and West Acres extension 17. This can be ascribed to the proximity of existing social and engineering infrastructure, economies of scale, employment opportunities, good access and visual exposure. An investigation of land development applications for township establishment, mainly submitted to the City of Mbombela Local Municipality, indicates that most of these applications are clustered around White River farm portions, Karino area, Tekwane area, Boschrand Heights and South of the Nelspruit CBD, and development in the eastern areas is mainly funded by the public sector focusing on the delivery of houses and associated social and engineering infrastructure. It is imperative that tenure issues be resolved and settlements be formalised and registered to attract private sector investment.

The future development trends of the municipality emanate from the future township developments as indicated as well as the proposed future roads according to the roads' master plan of the municipality. The City of Mbombela has identified the following new development areas which will play a vital role for future development of the municipality: Tekwane Mega Urban Hub, Nkosi City, Mataffin Stadium Precinct, Northern Areas Development, Plaston Park Precinct, Kruger Mpumalanga International Airport (KMIA) Hub, Rocky Drift–Dingwell, Mpumagreen and Kgarudi.

### 3.6 Land Use Activities, Spatial Planning and Expressions in City of Mbombela

Generally, land use patterns of urban and rural areas are mostly influenced by a diverse set of factors, which includes climate, topography and resource base in the area such as minerals, soils, etc. The broader land use patterns that occur within the City of Mbombela are categorised into natural elements, primary economic activities and human settlements. However, given population growth, the demand for industrial, commercial and social facilities in the main development axis of the municipality has been rising. The following section reviews these briefly.

#### 3.6.1 Industrial and Office Space Demand in the City of Mbombela

Increasing industrialisation, brought about by increased population growth and development, leads to more and more land being required for this use. The Rocky Drift industrial and commercial node has experienced significant growth over the past few years as it is ideally situated to provide for the overspill activities from Nelspruit, as well as White River. Riverside Park industrial and commercial node has experienced significant growth over the past few years accommodating commercial, warehouses, retail, offices, motor-related land uses and industrial developments. However, some of the southern regions (former Umjindi) has experienced a significant decline over the past few years in terms of industrial development. Table 3.5 indicates the anticipated industrial space demand for 2020 and 2030, given a scenario of higher future growth due to improved economic conditions in the market area.

#### 3.6.2 Trading Space Demand

Informal trade is an important economic sector, especially in the eastern parts, as it provides employment and livelihoods to a significant percentage of the people living in these areas. The informal sector will remain an important sector in Mbombela,

**Table 3.5** Industrial and office space demand

Cumulative additional demand	2020	2030
Finance and insurance (m <sup>2</sup> GLA)	103,230	182,842
Business services (m <sup>2</sup> GLA)	615,659	909,718
Total Mbombela	718,889 (±72 ha)	1,092,560 (±110 ha)

Source: Mbombela Corridor Modelling Market Study (2010a)

Note: Land required for industrial and office space if a floor area ratio (FAR) of 0.7 is applied is 102 ha in 2020 and 157 ha in 2030

**Table 3.6** Trade space demand

Cumulative additional demand	2020	2030
Wholesale and retail trade (m <sup>2</sup> GLA)	429,276	672,853
Catering and accommodation (m <sup>2</sup> GLA)	402,977	622,910
Total Mbombela	832,253 (±83 ha)	1,295,763 (±130 ha)

Source: Mbombela Corridor Modelling Market Study (2010b)

Note: Land required for trade space if a floor area ratio (FAR) of 0.7 is applied is 118 ha in 2020 and 186 ha in 2030

but an increasing number of people are supporting the formal retail sector, evident in the retail developments in Kabokweni, Kanyamazane as well as the facilities planned at Msogwaba and the upgrade of retail facilities in Matsulu. Table 3.6 indicates the anticipated trade space demand for 2020 and 2030, given a scenario of higher future growth due to improved economic conditions in the market area.

### 3.6.3 Waste Management Infrastructure History in Mbombela

The evolving waste management experience in Mbombela is typical of any secondary city in South Africa post-apartheid. Criticism in respect of inadequate or lack of infrastructure is an ongoing challenge. The problem is multi-faceted. One reason advanced is that there is insufficient equipment and a system for the collection of waste in the city. The machinery available, besides being not enough, is also plagued by frequent breakdowns. These breakdowns are linked to insufficient maintenance and/or the result of prolonged periods that these vehicles spend while awaiting to be serviced; meanwhile service delivery will be suffering. Table 3.7 presents the four operational solid waste landfill site statuses in the City of Mbombela.

Indeed, a value chain analysis of the collection, cleansing and transportation of waste in the study area reveals cracks and gaps in the system. These can be classified into the following main types:

- *Incomplete service area coverage*: Refuse collection is skewed to urban and semi-urban centres. There is limited to no collection in the rural areas and marginal areas. Consequently, approximately 27% of households in the former Mbombela Local Municipal area and 65.3% of households in the former Umjindi Local Municipal area receive refuse removal services.
- *Intra- and inter-uneven urban servicing*: Collection in the urban is skewed in favour of suburbs and intermittent for a select few of parts of the townships. In addition, public refuse drop facilities are very limited or inadequate and usually mostly concentrated in the affluent areas.
- *Service exclusion of informal settlements*: Little to no collection of waste in informal settlements and rural areas is a common phenomenon given that most probably these areas do not contribute or contribute little directly to the municipal fiscus system.

**Table 3.7** Landfill sites

Landfill site	Permit	Estimated life span	Proposal/recommendation
Tekwane west central disposal site	Yes	25 years	Improve operations and maintain infrastructure at the various landfills (Hazyview – while operational, Tekwane Central and Barberton)
Hazyview landfill	No	3 years	Improve operations and maintain infrastructure at the various landfills (Hazyview – while operational, Tekwane Central and Barberton) Establish transfer stations at Hazyview landfill (once closed and rehabilitated)
Mbombela landfill	Yes	–	Improve operations and maintain infrastructure at the various operational landfills to comply with permit/ license conditions
Barberton landfill	–	–	Upgrade the existing Barberton landfill site and a new disposal area established adjacent to the existing site to cater for future disposal requirements Investigate the feasibility to close the Barberton landfill site in the medium to long term and establish a transfer station on the closed site

In seeking to address these challenges, the municipality can explore, developing and implementing a municipal wide comprehensive waste collection strategy and action plan that is inclusive of all areas and new developments; enhance street clean-up campaigns in high-density townships as well as informal areas and rural areas; establish and extend waste transfer stations; as well as purchase appropriate waste collection vehicles. Opportunities for establishing biogas digesters from portable to large plants for energy production can also be explored as demonstrated feasible in other areas of South Africa and beyond (Ajay et al. 2021; Mavridis and Voudrias 2021).

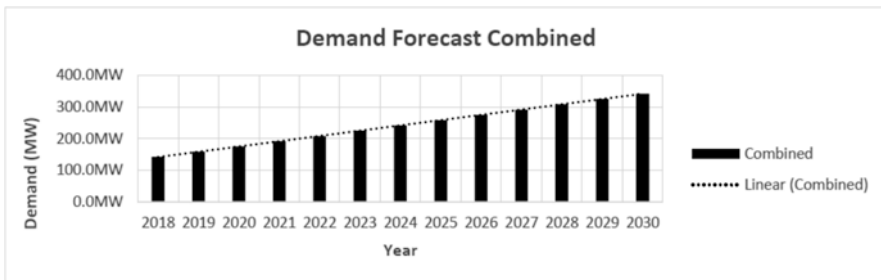
### 3.6.4 *Electricity Service Providers and the Power (Energy) Governance System*

The electrical service and power (energy) governance system within the municipal area is operated and maintained by City of Mbombela and Eskom. The Energy Department of City of Mbombela (CoM) delivers electrical engineering services to most of the urban areas within the four regions of the Mbombela municipal area. However, in Hazyview, Eskom supplies electricity directly to most of the bulk users. Generally, in the Eskom areas, CoM installs and maintains the street and high-mast lights. The financial drawback of the current arrangement is that street and area lights are not metered, and thus this service is rendered without any financial compensation. However, the long-term goal is for the city to increase electricity supply base and reduce number of Eskom intake points. The thrust in reducing number of

intake points will enable CoM to purchase electricity at a lower cost, thereby resulting in greater savings. On the other hand, in the predominantly rural areas of the city, Eskom supplies electricity directly to such areas. While this relieves the city of such a responsibility, the drawback is that Eskom does not supply any street or high-mast lights resulting in complaints about lack of street lighting to the municipality from such areas.

Overall, the electrical infrastructure services in the city are distributed via the following electrical grid system: intake points (bulk supply points) from Eskom (132/11 kV, 132/22 kV, 132/33 kV substations); distribution substations (132/11 kV, 22/11 kV); overhead distribution lines (132 kV, 22 kV and 11 kV lines); switching stations (22 kV, 11 kV); electrical reticulation (22 kV, 11 kV, 420 V); and street and high-mast lighting. An electricity demand forecast conducted in 2020 that took into consideration the new housing developments and backlog projects predicted that the electricity demand from the city will grow from a base load of 125 MW to 346 MW in 2030. The average growth rate per annum over the period until 2030 is 7.5% (refer to Fig. 3.4).

Given the load-shedding<sup>1</sup> challenges that the South Africa Eskom has started experiencing of late, alternative forms of energy such as renewables and various off-grid measures can be explored to augment electricity supply and as part of the city's contribution towards a low-carbon economy.



**Fig. 3.4** Electricity demand forecast

<sup>1</sup> South Africa's energy crisis or load-shedding refers to ongoing period(s) of widespread national blackouts of electricity supply which began in late 2007, and still persists to date. One of its main causes singled out to explain load-shedding in the country's is the heavy energy reliance on coal-fired power plants. Unfortunately, these plants are plagued by the twin problems of ageing infrastructure that require regular maintenance, resulting in breakdowns and unplanned outages. The result of these disruptions is reduced amount of electricity supply that is available to the national grid. Secondly, the country's coal supply has been unreliable due to operational issues and disruptions caused by labour strikes. Attempts at addressing this problem involve South Africa working to shift energy mix from coal to renewable energy sources such as wind and solar power.



### ***3.6.5 Built Environment, Engineering Services and Topographical Interactions in the Growth and Development Landscape of the City of Mbombela***

The city's topography is uneven. Mountainous areas are found mainly in the western and southern parts of the city. On the other hand, gently sloping areas dominate the eastern parts and segments of the south. The gradient in the municipal area falls sharply from a height of approximately 1200 m above sea level in the southern-western part to 350 m in the north-eastern parts. Consequently, most parts of the municipal area are characterised by steep slopes. In instances in which the slopes are greater than twenty percent (20%), such slopes are considered too steep for conventional housing and urban development. Generally, the provision of off-site bulk and on-site engineering services increases the steeper the slopes are (Douglas 2020; Hazelton and Murphy 2021).

### ***3.6.6 Impact of Geology and Topography in the Growth and Development Landscape of Mbombela***

The granites which cover most of the central, northern and eastern parts of the municipality prohibit large exploitation of groundwater due to the physical hydraulic nature of granite aquifers. While these granitic rocks offer a good bedrock for foundations, their downside is that when weathered into soil, the newly formed soil layer can easily collapse under pressure or weight. On the other hand, the southern region (former Umjindi) is mostly covered with the gabbro group, coupled with the shale, quartzite, sandstone, greywacke and mafic groups. These geologic rock-type groups are highly permeable and erodible, comprising of colluvial sands and residual soils that are overlaid on the granitic bedrock (potassic gneiss and migmatite). This is quite common in the Kanyamazane area. At the same time, the western part of the City of Mbombela comprises of a variety of geology groups including shale, dolomite,<sup>2</sup> quartzite, andesite, ultramafic rocks and gneiss. Dolomite rocks give rise to caustic features; the most notable in Mbombela is the 1.8-km-long Sudwala Caves (City of Mbombela 2021). For example, Hazyview is underlain by granodiorite and Matsulu is underlain by gneiss. Overall, these geological formations have spatial risk implications in the growth of the city. Furthermore, the dolomite band stretching from Sudwala southwards is considered a *high risk* if not a *no-go* area for urban development. This is because of either or a combination of the following:

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<sup>2</sup>Dolomite is unstable and can cause dolines or sinkholes presenting risks and threats to human settlements, infrastructure and services such as houses, roads and road networks, water and sewer systems and networks, etc.

being an area that is affected by sinkholes or areas where heaving clays are present. As a result, some areas underlain by geology types are generally considered not suitable for urban development in the City of Mbombela. Such areas have usually been excluded from development and included into a conservation zone or an open space system use.

### **3.6.7 Housing Backlog**

A key challenge in the City of Mbombela (CoM) is urban inequality. This problem is not unique to the city but common in urban areas in both developed and developing countries although with differentiated nuances and twists (Chirisa et al. 2020; Silva-Laya et al. 2020; Vilar-Compte et al. 2021). With rapid population and urbanisation in the absence of commensurate industrialisation, poverty, unemployment and inequalities become challenging issues that require solutions (Arfanuzzaman and Dahiya 2019; Kookana et al. 2020). Another consequence of this situation is growing housing backlog in the city. This also manifests itself in informal housing and settlements including the ever-present threats of land invasion and urban sprawl into surrounding farms and areas under traditional authority (Matamanda 2020; Weimann and Oni 2019). The housing backlog is estimated at approximately 32,000 housing units (Mpumalanga Province 2023). Options of providing decent low-cost social housing accommodation based on various public–private partnership models can be explored in partnership with the department of human settlements, alternative cost building agencies and organisations such as Moladi and the Council for Scientific and Industrial Research (CSIR).

In the future, 3-D printing of low-cost housing<sup>3</sup> can help in reducing housing backlogs which is also an area ripe for exploration. At the same time, the call to create self-contained and vibrant neighbourhoods and townships implies the need to expedite work on building and revitalising townships as well as accelerating work on densification, compaction and integration zones as identified in the spatial development frameworks (SDFs) and related documents.

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<sup>3</sup>Whether 3-D printing of houses will impact low cost and fast turnaround times in housing delivery in South Africa in the future is debatable. While history and experience point to the fact that most high tech housing systems have failed in South Africa, it is debatable whether there is no place for high-tech housing in South Africa National (Department of Human Settlements 2017). Further research and work will assist in providing a clear roadmap and path in respect to domesticating 3-D printing for low-cost housing in South Africa or not.

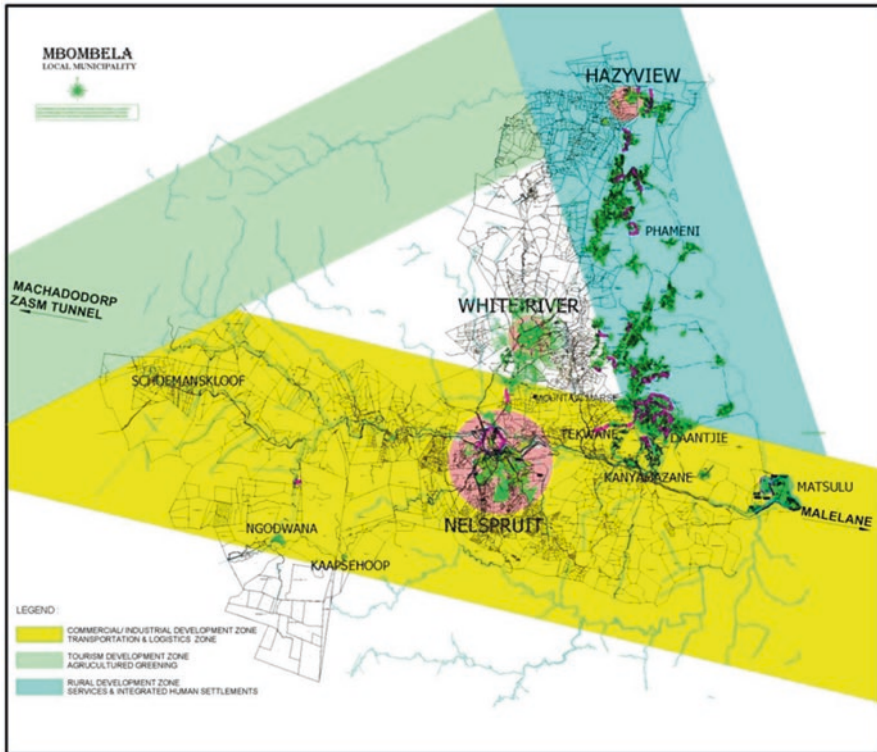
### ***3.6.8 Mbombela Golden Triangle: An Enduring Place Making, Branding Spatial and Urban Design Narrative***

Since 1994 and in the context of the first generation of SDFs as introduced by the Municipal Systems Act in 2001, intense spatial planning and development discourses gave birth to the *Sakha iMbombela* turnaround strategy. The strategy centrepiece was building the spatial *Golden Triangle* as a guide to the spatial development narratives and signatures of the municipality. The Golden Triangle was designed in compliance with the National Spatial Development Perspective (NSDP) (2006) principle of spatially targeting and developing spatial areas according to their inert spatial potential. The N4 road corridor has always been identified as a corridor and region with vast industrial potential. On the other hand, R40 road corridor has always been identified as a corridor and regional functional tourism area given its proximity to the Kruger National Park (KNP). The Mbombela Local Municipality's first spatial development framework (SDF), which was subsequently reviewed with the most recent review being in 2019, gave spatial effect to implementing the spatial logic of the Golden Triangle as a spatial transformation, investment and targeting tool and mechanism in the region.

Figure 3.5 illustrates the Golden Triangle of the then Mbombela Local Municipality (MLM). The spatial logic of the Golden Triangle remains an enduring and overarching spatial structuring, design and tactical urbanism representation of both elements and moments for opportunities of public space (urban, semi-rural and per-urban) regeneration, renewal, township revitalisation, biodiversity conservation and management, transit-oriented and corridor development as well as reminder for the need of alignment and coordination of multiple, nested and overlapping layers of governance and management in the area.

### ***3.6.9 Analysis on Building a Capable Municipal Local Governance System in Mbombela: The Amalgamation Paradox***

Literature is replete with contradictory examples on how rich and poor local municipalities can be amalgamated for better economic efficiency, improved governance system and service delivery, while cases in which the resultant bigger municipalities have suffered setback and constraints owing to deterioration in service delivery and structural political gimmicking and agendas winding the clocks backwards to the detriment of locking development away from locals to benefits as anticipated instead becoming the undesirable outcome and result (Ananda and Martin-Sardesai 2022; Dollery et al. 2020; Myksvoll 2023; Netswera 2022; Wright and Slukhai 2021). Amalgamation was adopted with a view for enhanced performance in the study area.



**Fig. 3.5** The Golden Triangle. (Source: Mbombela Local Municipality, Mbombela Local Municipality 2010)

*Figure Interpretation:* The yellow notation symbolises the *yellow belt* along the N4, starting from Machadodorp/ZASM tunnel towards Matsulu/Maputo; green notation symbolises the *green belt* for tourism that starts from Machadodorp/ZASM tunnel to Hazyview. The green notation also covers the R40 road to Hazyview. The blue notation symbolises the *blue belt* from Hazyview, Nsikazi and towards Matsulu, where infrastructure, particularly water, need to be provided

The amalgamation of the two municipalities resulted in the City of Mbombela Local Municipality having satellite centres which improved the coordination of service delivery. In addition, the traditional leaders were merged, i.e. prior to the amalgamation. In this respect GIZ supported the municipality in the development of a single organogram aligned to the integrated development plans (IDPs) and Service Delivery and Budget Implementation Plan (SDBIP).

At the same time, the processes on the placement of all staff from the two former municipalities were concluded with the organisational structure being approved on the twenty-ninth (29th) of May (05), twenty nineteen (2019) (City of Mbombela 2021). There are currently 5207 posts, of which 1961 are filled and 3246 are vacant (City of Mbombela 2023). The number of males in posts is 1227, females 734, youth 438 and disabled 10. However, the municipality has a challenge in the implementation

of Employment Equity Plan. From a male transformation perspective, the fact that there are only two senior managers who are female out of the fifteen (15) managers represents an opportunity for transformation and empowerment.

Capacity constraints in key areas together with funding constraints continue to compromise the ability and capacity of the City of Mbombela to deliver adequate services in the municipal area. Consequently, service delivery protests do occur from time to time. As an example, in February 2020, there were community protests in the Umjindi area. The residents listed the following issues as complaints, namely, poor service delivery, lack of economic opportunities and that they wanted their area to be a stand-alone municipality again (i.e. to be re-constituted and re-established as Umjindi Local Municipality again). While the Member of the Executive Council (MEC) engaged the Municipal Demarcation Board (MDB) on the matter, the MDB responded that the matter would be considered after the 2021 local government elections.

To date no public statement on this matter has been made. However, the fact that the MDB is being asked to consider rescinding the previous decision that resulted in the amalgamation and establishment of the City of Mbombela raises question marks on the local government spatial governance resilience and sustainability in changing times and circumstances. This calls into further question as to what requires reform, is it the local governance institutional and administrative set-up from a scale and economies of scale perspective or is it a governance transparency and accountability image from being locally present and close to the grassroots experience or is it about the laws and lack of funding generally.

In addition, the following problems have been cited in the predominantly urban, rural and peri-urban areas of the City of Mbombela: water scarcity in the rural communities; sporadic mushrooming of informal settlements; no spatial developmental growth on the periphery of the inner city; no tangible job creation; unemployment, poverty and inequality that have increased due to COVID-19 pandemic; and the amalgamation process that has not yielded the desired results. Given the intertwined nature of the problems and issues that confront the City of Mbombela, the Department of Cooperative Governance and Traditional Affairs (COGTA) and other relevant stakeholders in Mpumalanga province continue engaging and supporting the municipality within the realms of a *one or single governance* local developmental model in light of sustainable development goals (SDGs), New Urban Agenda (2015), climate change and human development indicators (Ciasullo et al. 2020; De Guimarães et al. 2020; Meyer and Auriacombe 2019). This has strong resonance with the district development model as recently introduced and being implemented or contemplated by the Department of Cooperative Governance and Traditional Affairs throughout the country (Khambule 2021).

One strategy that has been adopted has been the development of a turnaround plan to address all the issues highlighted under the sustainability assessment report (City of Mbombela 2021). The implementation of the turnaround strategy has however not stopped the communities who have continued to protest over poor service delivery. In respect of the functionality of formal structures and systems to facilitate engagement platforms, the post-amalgamation has helped in bringing an

**Table 3.8** Participation architecture in the City of Mbombela pre- and post-amalgamation

Municipality	Activities	Status pre-amalgamation 2015/2016	Status post-amalgamation 2017/2018
Umjindi Local Municipality	Ward committees	All nine wards were functional	There is an improvement in the functionality of wards, 35 out of 45 wards were functional
Mbombela Local Municipality	Ward committees	18 out of 39 wards were functional	

improvement, but the systems are still criticised as not having matured enough. However, the fact that at least ten (10) formal wards still have formal recorded participation systems gaps and cracks reveals the lack of inclusive and comprehensive participation systems and structures in the study area (refer to Table 3.8).

With the new system as introduced in 2016, the financial system has remained relatively the same with the proviso of an amalgamated accounting system. The Municipal Demarcation Transitional Grant (MDTG) that was provided to the municipality to facilitate the integration of systems has been cited as one of the reasons that explains the status quo. Consequently, the audit outcome has remained unchanged since 2015/2016–2017/2018 financial years. However, the municipality is still plagued by the challenge of inaccurate billing system together with low consumer payment rates by township and rural communities. At the same time, Umjindi and Mbombela Local Municipalities had separate Tribunals before the amalgamation and have since established a single Municipal Planning Tribunal as required by the spatial planning, land use and management act (SPLUMA) (2013). In any case, projects that were started prior to the amalgamation have since been completed and are operational owing to a combined increase in budgeting, wider income and revenue base, increased capacity and enhanced governance system, e.g. the classic example of SDFs in the study area as reflected in Table 3.9.

### 3.7 Municipal Governance, Planning and Management of the Secondary City

The City of Mbombela has implemented the Integrated Public Transport Network (IPTN) as one measure of fighting the spatial axis development corridor systems inefficiencies through developing the axis into a public transport-orientated system. Figure 3.6 presents the major corridor and multiple feeders' principle that underpin the Integrated Public Transport Network (IPTN) as well as being a depiction of the network illustration concept.

As illustrated in Fig. 3.6, the MIPTN is an example of an integrative transport fighting mechanism that is conceptually based on the following values, norms and principles:

- Ensuring the development of effective land use and transport systems that integrate existing bus and mini-bus taxi (MBT) systems on an equitable basis.

**Table 3.9** Spatial rationale history in the City of Mbombela

Municipality	Activities	Status pre-amalgamation 2015/2016	Status post-amalgamation 2017/2018
Umjindi Local Municipality	SDF	SDF was approved and implemented	SDF was approved and implemented Municipality is in the process to prepare SPLUMA–land use scheme
	SPLUMA	The municipality failed to adopt delegation on SPLUMA functions	
Mbombela Local Municipality	SDF	SDF was approved and implemented	
	SPLUMA	The municipality was ready to implement SPLUMA	

- Responding timeously to the contextual requirements of public transport commuting demand in the City of Mbombela.
- Providing greater choice for public transport commuters that is linked to quality of service.
- Deployment of a system of public transport operations that is based on a structured and organised public transport system schedule covering the full day including peak and off-peak times and public holidays.
- Extending the public transport feeder services deeper into marginal and under-serviced communities residing in semi-rural or urban fringes of the City of Mbombela.
- Supporting measures in place aimed at reducing public commuters’ walking distances and overall travel time.

In complementing the IPTN plan, the City of Mbombela has simultaneously activated the spatial development plan (SDF) as part of a multi-pronged approach aimed at redressing the apartheid legacy. This means that the spatial development framework (SDF) and the Mbombela Integrated Public Transport Network (MIPTN) are mutually complementary and integrative land use and transport interventions. Figure 3.7 presents a schematic illustration of inherited spatial apartheid geography that is being spatially confronted and dismantled through both reform and spatial targeting projects such as the MITNP.

From Fig. 3.7, an appreciation of the City of Mbombela’s spatial layout and design plan can be deciphered. As indicated in Fig. 3.7, many of the inhabitants in the City of Mbombela still live outside the White River CBD and Nelspruit CBD core. Consequently, the MITNP operational plan is underpinned by an integrated web of local feeder and long-haul linkages that supports the use of mixed fleet (mini-bus taxis,<sup>4</sup> midibuses<sup>5</sup> and buses). In this way, the Mbombela public transport

<sup>4</sup>A ‘mini-bus taxi’ in South Africa means a motor vehicle designed or modified solely or principally for conveying more than 9 but not more than 16 seated persons, including the driver (Department of Transport 2009).

<sup>5</sup>A ‘midibus’ in South Africa means a motor vehicle designed or modified solely or principally for conveying more than 16 but not more than 35 persons, including the driver, and for the purposes of the National Road Traffic Act is a type of sub-category of bus (Department of Transport 2009).

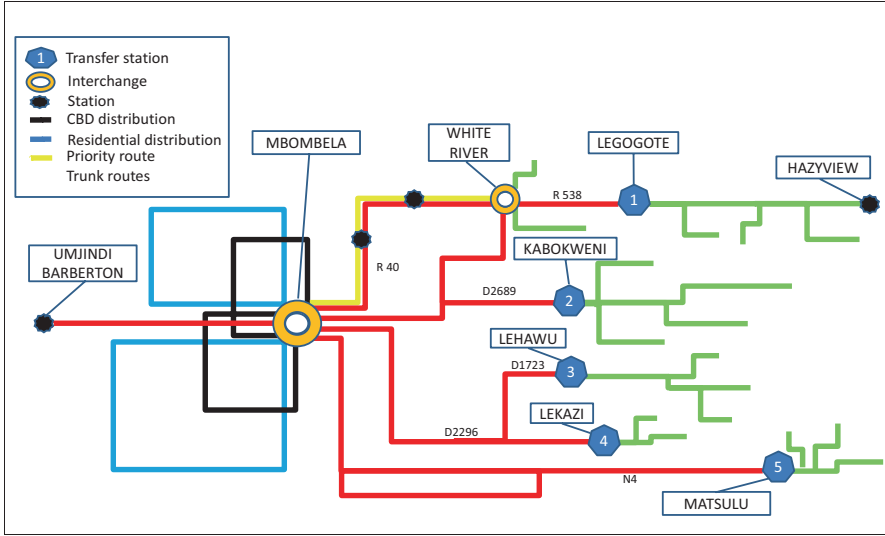


Fig. 3.6 MIPTN land use and transportation network schematic illustration concept. (Source: City of Mbombela 2022)

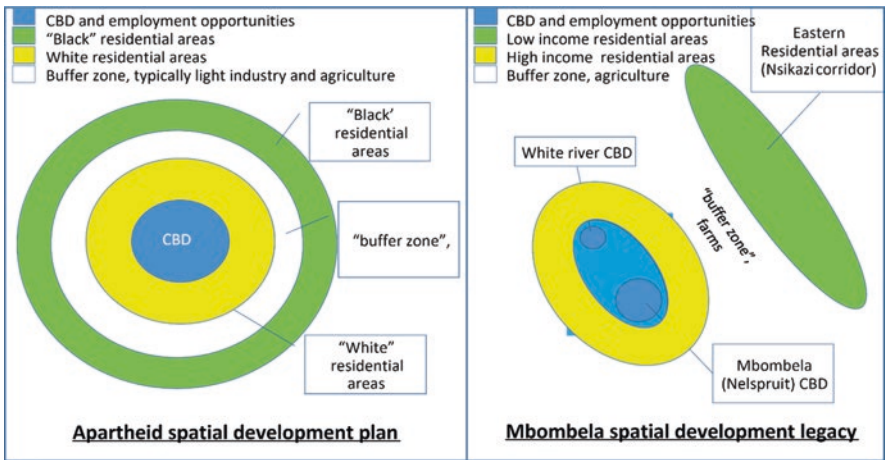


Fig. 3.7 Schematic illustration of City of Mbombela's spatial layout and design plan. (Source: City of Mbombela 2022)

(PT) hub is strategically positioned to allow for multimodal integration including rail station, MBTs and bus services. MIPTN aims at improving city mobility and accessibility through transit-oriented development including non-motorised transport that supports multimodal integration. Fig. 3.8 presents a schematic illustration of MIPTN operational implementation plan together with the MIPTN key implementation phases.



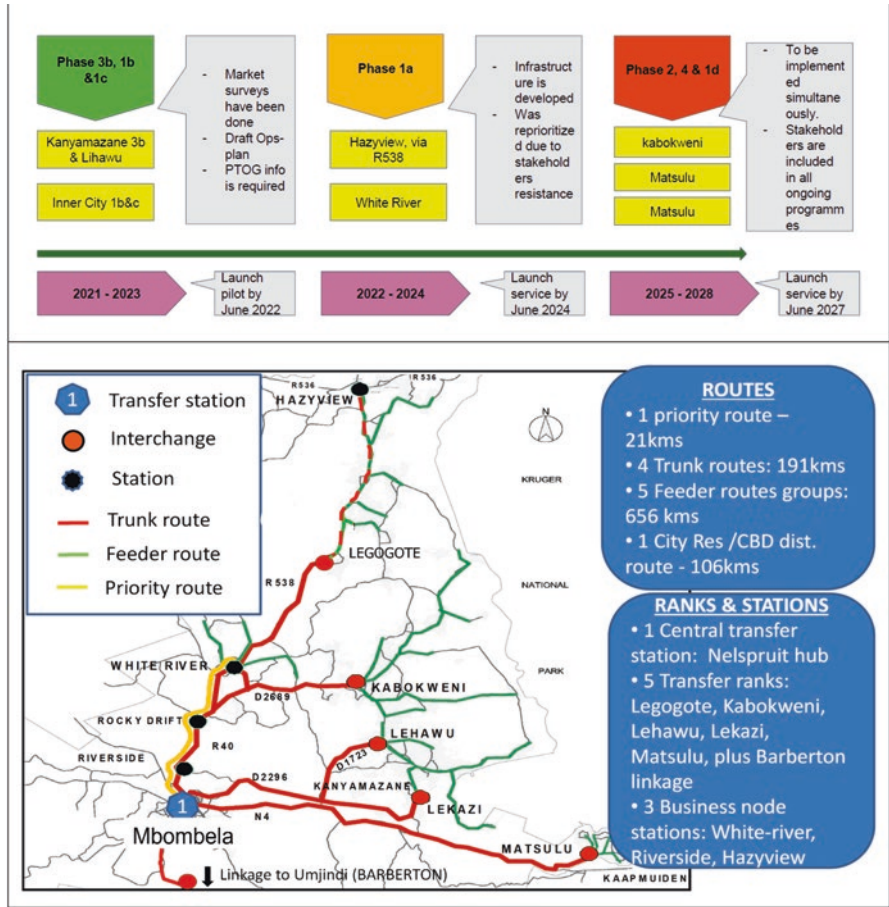


Fig. 3.8 MIPTN operational implementation plan and key implementation phases. (Source: City of Mbombela 2022)

Key: Top, MIPTN operational implementation plan; bottom, full network plan

Figure 3.8 presents the key operational principles for the MIPTN. It also highlights that the implementation follows a structured approach and has a *learn-by-doing* component built in the project execution. Research from bus rapid transport (BRT) in Lahore and Tanzania has highlighted the importance of pilot studies and pilot projects in ensuring BRT project refinement, implementation, sustainability and success (Adeel et al. 2021; Krüger et al. 2021). It is for this reason among others that the project starts with a pilot project – along Legogote Corridor only before any roll-out to other corridors is executed. From this testing pilot phase, which is based on ensuring that empirical and evidence-based research policy, planning, design and implementation lessons are built back into the MIPTN for enhanced outcomes,

future project extensions will be crafted. Central in this approach is to adapt the IPTN design if and where necessary, and ensure that the final implemented IPTN is cost-effective, affordable and contextually relevant and appropriate.

In essence the roll-out of the MIPTN plan supports the objectives of the National Development Plan (NDP-2030) that by 2030 investments in the public transport sector should foster the integration of fragmented spaces, reduction of commuter travelling distances, times and costs and improvement in public transport level of service, i.e. reliability, safety and security. These interventions are also important as part of a package of interventions aimed at promoting and building a low-carbon economy by offering transport alternatives that minimise environmental harm (Nethengwe 2022; Odiyo et al. 2022; Tait and Euston-Brown 2017). Additionally, the MIPTN is being implemented against a target of a minimum of 30% subcontracting work to small black-owned enterprises as a way of supporting and promoting the ethos, values and spirit of the broad-based black economic empowerment policy of South Africa (refer to Fig. 3.9).

It should be further highlighted that the implementation success of mega projects such as MIPTN requires financial funding that usually a single financially constrained municipality such as City of Mbombela may find difficulty in mobilising. It is for such reasons that such projects are implemented within the purview of various public-private partnerships such as Built, Own, Operate and Transfer. The South African government through the Department of Transport is funding the project under the public transport scheme (refer to Fig. 3.10).

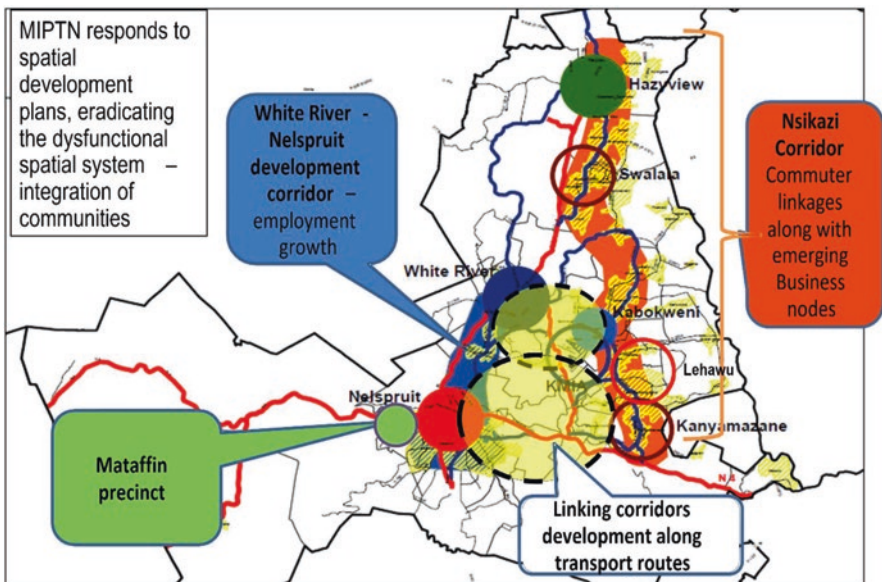
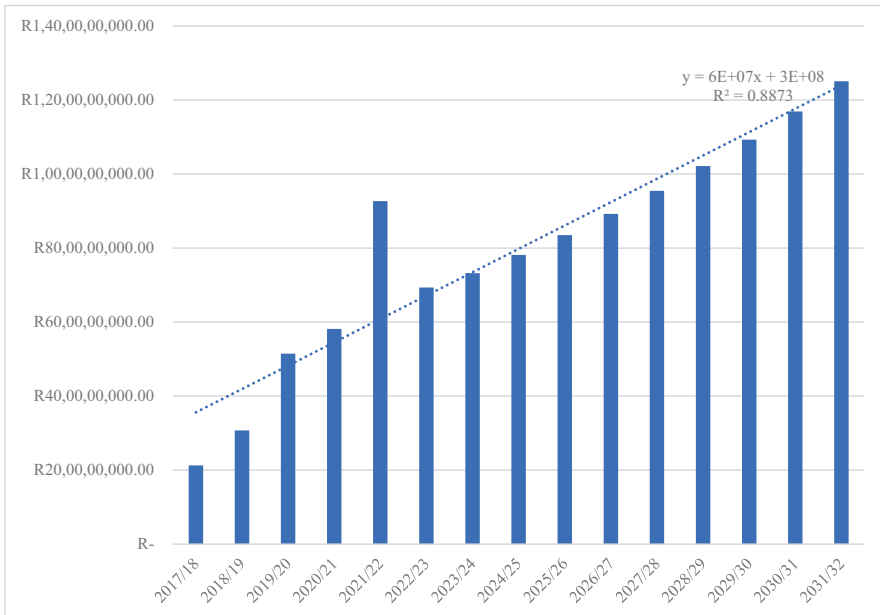


Fig. 3.9 MIPTN alignment with the spatial development framework. (Source: City of Mbombela 2022)



**Fig. 3.10** MIPTN Capital Funding 2017–2032

In full implementation, the MITPN will move huge volumes and flows of commuters within the City of Mbombela spatial landscape. The system will provide for the implementation of an automated fare collection system – ticketing method using a card cashless system (e.g. simple tap-on and tap-off) – and make it possible to have a zonal instead of a flat ticketing system. This will bring the transport system in line with world-class public transport systems in terms of operations and quality of services (Kepaptsoglou et al. 2020; Sarjono and Wulandari 2022; Trubia et al. 2020). Table 3.10 presents the commuter volumes modelled for the Mbombela Public Transport Integrated Plan (MPTIP).

As depicted by Fig. 3.10, the MIPTN modelling results confirmed a total number of weekly passenger trip kms at 14724490, translating into 765 million per annum passenger trip kms (City of Mbombela 2019, 2022). In respect of the impact of the MITPN transport flows, movement corridors and distribution, the system will assist with:

- Reducing road congestion over peak hours, through applying public transport efficiencies and reducing travel peaks.
- Providing greater travel opportunities and certainty, through scheduled, integrated and expanded system.
- Providing greater travel choice and flexibility and reduce the public transport peaks and headways.
- Promoting and enabling shift from private cars to public transport, particularly with the residential and CBD distribution systems.

**Table 3.10** Commuter volumes modelled for the MPTIP

Area of origin	Peak periods	Total vehicle's	Ave passenger kms per trip	Total weekly passenger kms per trip	Total annual passenger kms
	Trips				
<i>Legogote</i>					
Bus	1.5	24	41	2,336,699	133,659,163
MBT	6	38	41	984,359	56,305,308
<i>Feeders</i>					
MBT	12	20	17	430,100	24,601,720
<i>Kabokweni</i>					
Bus	2.0	16	29	3,856,503	220,591,952
MBT	8	20	29	623,882	35,686,052
<i>Lekazi/Kanyamazane</i>					
Bus	3.0	33	24	2,918,024	166,910,954
MBT	8	12	23	282,143	16,138,563
<i>Matsulu</i>					
Bus	1.5	31	40	1,519,804	86,932,789
MBT	6	24	40	620,792	35,509,310
<i>Umjindi</i>					
Bus		2	44	501,535	28,687,820
MBT	6	6	44	242,000	13,842,400
<i>CBD distribution</i>					
Bus	1.5	–	8	–	–
MBT	6	12	8	253,440	14,496,768
<i>Residential distribution</i>					
Bus	2.0	–	10	–	–
MBT	6	24	10	155,210	8,878,011

Source: City of Mbombela (2022)

- Supporting the reduction in collisions and reduced road fatalities, particularly pedestrians through integration with and investments in non-motorised transport, specifically providing pedestrian footpaths and safe crossings.
- Ultimately providing universal access for all special travel groups.
- Generally, providing an improved travel, access and safety environment.

In preparing for various implementation and transport governance systems, bilateral meetings with mini-bus taxi (MBT) industry and Buscor participation as well as between MBT and Buscor are in motion. An interesting component of the MPTIP is an inbuilt revenue formula aimed at limiting exposure to public grant funding or subsidies. This is to reduce over-dependence of the public transport system on government subsidies which has been a weakness of various public transport projects in developing countries and at times identified by research as leading to perennial inefficiencies in the functioning and operations of the public transport system (Broniewicz and Ogrodnik 2020; Vickerman 2021). Fare revenue is being modelled

to cover approximately 30–32% of the total revenue requirement. Mbombela IPTN is in a unique position, as the established bus industry currently operating under the Public Transport Operations Grant (PTOG) reflects close to 80% of the existing bulk commuter services, with MBTs accounting for approximately 20% of these services (City of Mbombela 2022). This is unlike in several South African cities in which the public commuting trips are split 60–80% in favour of MBTs and 20–40% bus industry (Rao et al. 2019; Scordia and Munoz-Raskin 2019; Witte 2022).

Invariably, a major component of the subsidised revenue component is covered in existing Public Transport Operations Grant (PTOG) grant framework, ultimately being integrated with the MIPTN. Viewed otherwise, the operating grant will be applied to largely cover the inclusion of the MBT industry into the transport subsidy regime. While other sources of revenue are also being explored, such as advertising and trading concessions, however these will account for a small component of the revenue requirement. The Inter-governmental Relations (IGR) committee established between City of Mbombela, Ehlanzeni District Municipality, Mpumalanga Provincial Government, Mpumalanga Department of Transport, COGTA, South African Local Government Association (SALGA), Municipal Infrastructure Support Agency (MISA) and the National Department of Transport continues to play a pivotal role in facilitating engagements with Buscor and providing Public Transport Operations Grant (information to MIPTN Technical Committee) as an example. An important branding and communication outcome was a Council Approved the name *Hamba Sambe* for MIPTN. In addition, new developments such as Nkosi City, the University of Mpumalanga, etc. require critical investments in integrated public transport. While a plan to transform the Public Transport Unit into a Transport Authority has been developed, this raises questions on the adequacy of the existing municipal structure to deliver on the requirements of the MPTIP.

### 3.8 Discussion and Synthesis

The study findings reveal that the spatial structure, layout, design and plan of the City of Mbombela are typical and expected of most post-apartheid South African cities. These cities have spatial structures and systems with systematic and systemic differentiated, contextual and granulated history, planning, design, processes, systems, institutions and culture narratives, dialogues and struggles. Bold conversations and actions are required in confronting and dismantling these post-apartheid geography colonies with respect to the following current challenges to future desired post-colonies urban, semi-urban and peri-urban South African cities. Some of these interdependent and mutually complementary areas include:

- Exploring innovative, alternative, resilient and sustainable mechanisms, and way in respect to the phenomenon of urban sprawl, limiting densities and urban edge line spatial implications and planning.

- Confronting and tackling the problem of inter- and intra-high levels and variability of spatial inequality and a mismatch between jobs and housing especially in relation to the traditional urban core and previously disadvantaged townships and rural fringe or peri-urban zones incorporated into the city boundaries.
- Seeking to tackle fragmentation and spatial disconnection through various compactations and densification strategies such as the implementation of the transit-oriented development projects in the form of the MIPTN.
- Addressing limited diversity and inefficient land use patterns created in the form of multi-layered spatial governance and management challenges such as land invasions, housing shortages, informalities and insecure land tenure systems. These deficient systems are prevalent in peri-urban areas and the rural fringe. These phenomena and processes pose a threat and risk in respect of loss of biodiversity and benefits as increasing pressure on the natural environment threatens sustainability.

Understanding these spatial shortcomings, the dynamics that drive them and the opportunities that exist for addressing them provide a basis for moving forwards with a new transformative vision for the city. The current pattern of job dispersal within the city results in and exacerbates socio-economic exclusion, constrained mobility, high congestion, high energy and carbon intensity and environmental pollution; accentuates poverty; reinforces inequalities and high infrastructure costs; and jeopardises urban productivity. Making use of the spatial justice, spatial resilience, spatial sustainability, spatial efficiency, spatial quality and spatial transformation norms, standards, values, principles and tools as espoused in the National Development Plan (2030) and NSDF (2022) constitutes a key action plan in making the City of Mbombela a preferred city of choice to live, work, recreate and invest in for purposes of intergenerational wealth, productivity, success creation and replication.

The study findings, furthermore, highlight that the lack of integration in the public transport system is worsened by the persistent inequality between modes (i.e. mini-bus taxi, buses and BRT systems) and within modes, and by extension although not fully applicable in the City of Mbombela within the rail mode sector (i.e. Gautrain and Metrorail). These differences in public transport infrastructure investment, spatial targeting transport corridor development, service levels and quality standards constitute a layered stacking of constraints in the quest to integrated transport modes in South Africa and developing countries by extension. The differences in service levels further deepen the socio-economic divide in the society as public transport is now catering for different classes. A key objective of the Mbombela spatial development plan is to redress the spatial, economic and transport inefficiencies induced by apartheid segregation planning through among other initiatives using public transport through the MIPTN steering mechanism as a pivot in advancing spatial change and transformation. However, an emerging policy and implementation gap constraining the full realisation of the proposed spatial and transportation

models is the lack of an upfront testing model for policy and implementation feasibility and relevance prior to approval of the proposals and plans by the relevant authorities (van Heerden and van Vuuren 2022).

Unemployment, poverty and inequalities that are unbalanced in the City of Mbombela require multi-pronged approaches and solutions. These can range from place based to municipal-wide policies to incentive business investment and developments in the area. Re-imagining township economies and bringing job density, spatially targeting investments in small, medium micro enterprises as well as urban agriculture industry value chain, are possible ways to improve the spatial economies of the areas in Mpumalanga. Changing the spatial narrative and story of the areas requires seizing moments of investment and decision-making opportunities to overcome high levels of illiteracy, poverty and limited infrastructure through valorising appropriate technology, science and developments that are contextually relevant and spatially inspiring and transformative. While efforts by the Mbombela Local Municipality in adopting projects and initiatives (including public-private partnerships) that promote inclusive strategies for economic growth are commendable, the need to build the capacity and governance reporting systems for integrity is vital. Capitalising on tourism dividends through spatially targeting and linking spatial development initiative (SDI) investment and initiatives, especially the Maputo Development Corridor, i.e. N4 corridor, as part of the extended geographical economic hub for the region, will usher in a future Mbombela city region that is resilient, sustainable, inclusive and spatially more efficient than hitherto.

### 3.9 Conclusion

This chapter set out to explore how the application of a transit-oriented development theory and approach could present alternative growth and development pathways in Mbombela (formerly Nelspruit), Mpumalanga province as one possible way of ‘fixing’ the historical spatial jigsaw corridor-based secondary city challenges and issues. The chapter was also able to discuss how Nelspruit’s urban development opportunities can be developed taking cognisance of existing and projected growth and development constraints. The main argument advanced is that Nelspruit future spatial and land use growth and development model(s) should seek to integrate land use and transport corridor’s dividends consciously better for enhanced growth and development of Mbombela (formerly Nelspruit) and immediate environments. Generally, service delivery covering the full gamut of water and sanitation, energy, housing, transport and waste management is a pressing issue requiring urgent attention in the study area. This is because the current infrastructure is limited and unable to service all citizens since it is old and requires upgrading at great cost.

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