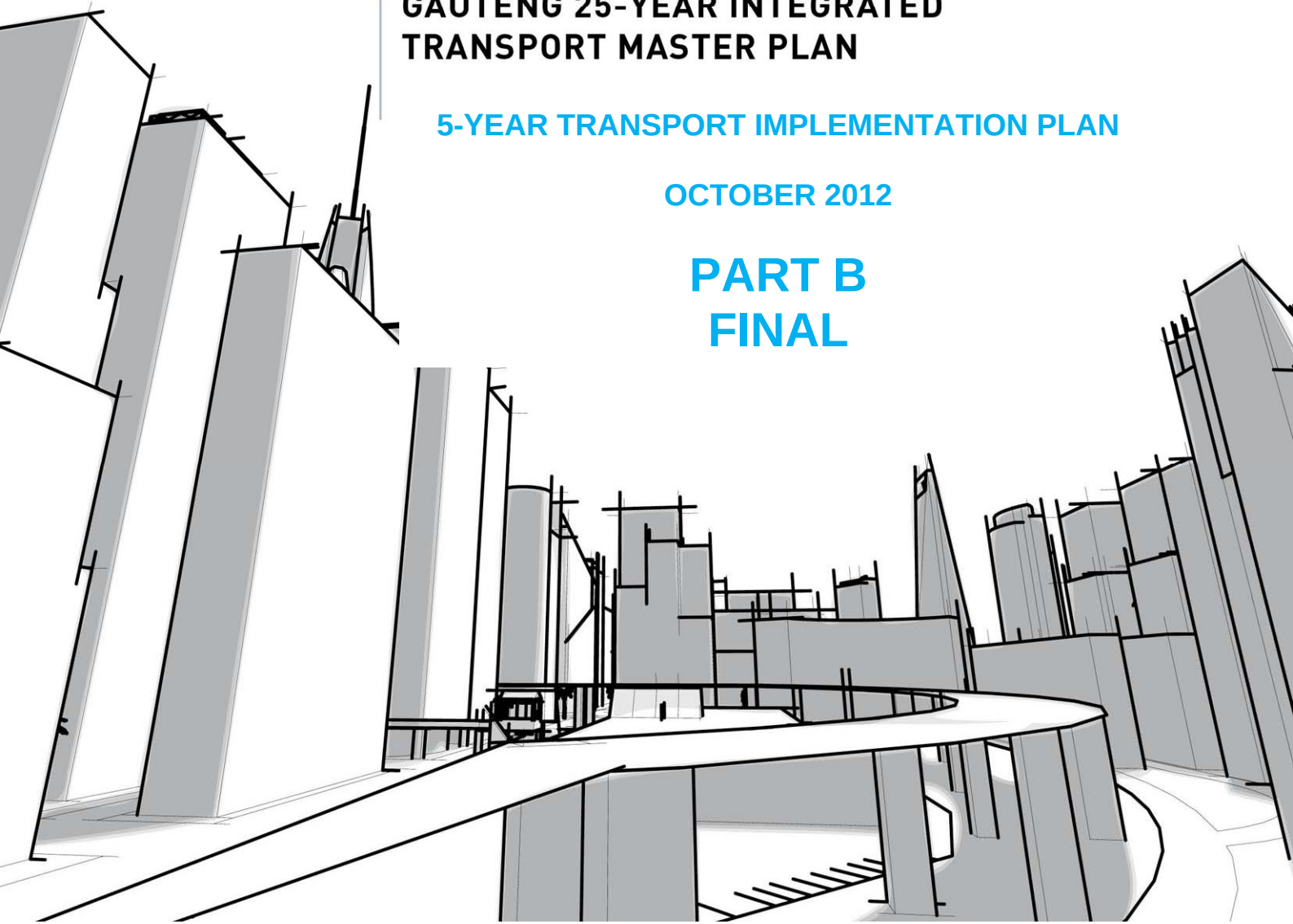
roads and transport
Department: Roads and Transport
GAUTENG PROVINCE

GAUTENG 25-YEAR INTEGRATED TRANSPORT MASTER PLAN

5-YEAR TRANSPORT IMPLEMENTATION PLAN

OCTOBER 2012

PART B
FINAL



GAUTENG 25-YEAR INTEGRATED TRANSPORT MASTER PLAN

FIVE-YEAR TRANSPORT IMPLEMENTATION PLAN

CONTENTS

This is the second part of the GTIP5 report - analysis of the state of transport in Gauteng

9 STRATEGIC PUBLIC TRANSPORT NETWORK PLAN

9.1 State of Planning

The various transport plans applicable to public transport in Gauteng, which were studied and assessed are listed in **Table 9.1**.

Table 9.1 – Public Transport Plans

	Plan Title	Completion Date	Approval Status
1.	NATMAP	2010	Not approved
2.	Public Transport Action Plan,	Jan 07	Approved
3.	Gauteng SPTN	Nov 04	Approved
4.	Integrated Public Transport Action Plan	2007	Approved
5.	Gauteng IPTN	Jul 09	Approved
6.	Gauteng IPTN, review of proposals for COJ, CoT, West Rand and Sedibeng & designs for Merafong and Metsweding	*Was due April 2012*	-
7.	City of Tshwane BRT Operational Plan	2008	Approved
8.	City of Tshwane Draft IRPTN Operational Plan, 2012	Jun 12	Draft
9.	City of Joburg BRT Operational Plan		Approved
10.	Ekurhuleni Modal Integration Study	2008	Approved
11.	Ekurhuleni IRPTN Scoping Study	2012	Draft
12.	West Rand District Municipality DITP	2009	Approved
13.	Sedibeng District Municipality IPTN Design Report and DITP	2009	Approved
14.	Nkangala District Municipality CPTR	2008	Approved

The plans in the above-mentioned table is summarised in the following section.

9.1.1 NATMAP, 2010

The National Transport Master plan was developed to enable the National Department of transport to have a strategic coordinated implementation schedule/action agenda for transport in the whole country. The transportation plans of the nine provinces were used as building blocks in the development of the National Transport Master Plan

The aim of the National Transport Master Plan 2005-2050 is for the plan to be the framework by which future state-of-the-art land use/multimodal transportation systems planning, implementation, maintenance, operations, investments and monitoring decisions can be made. The national plan thus advocates an integrated and coordinated approach to transport planning in South Africa.

The objectives of the NATMAP are to deliver on the following:

- Land use/spatial development models to achieve multi modal transportation efficiencies;
- From a transportation perspective, focused visions, goals, objectives, implementation parameters and prioritised projects for the identified development corridors and economic hubs;
- Integrated growth and development strategies utilising transportation as the catalyst;
- Integrated multi-modal infrastructure facilities development plan;
- Cost effective policy development in order to enhance coordination and integration

In terms of passenger transport NATMAP includes an analysis and summary of the most pertinent problems and issues experienced in Gauteng. Some of the main points are:

- Demand in Gauteng is currently supported by the supply of a number of services. Infrastructure capacity bottlenecks are mainly the result of the sharing of critical road infrastructure by local public transport services and private transport.
- The public transportation network is unable to efficiently and cost-effectively link excluded settlements to the concentration of economic opportunity within Gauteng.
- Rivalry exists between institutions on the national, provincial and municipal levels over the planning, strategy development, operational control and implementation.
- Competition exists between modes and institutions on the roles of the different modes as well as competition for getting government funding for implementation.
- The existing public transport services under current operating and management practices are unsustainable. Low levels of profitability for many private operators' results in a failure to adequately maintain and recapitalise fleets.

- The modal integration of public transport services is limited and public transport planning and infrastructure provision does not support the integration of transport modes.

The Analysis conducted as part of the formulation of the NATMAP found that most passenger operational problems are related to inefficient management, insufficient funding, institutional fragmentation, as well as inadequate and complex legislation; and not due to infrastructure.

With regards to Strategic Public Transport Networks, The National Transport Master plan highlights the fact that while Public Transport Plans for Gauteng's metropolitan and district municipalities have been completed; they mostly reflect the status quo of public transport in the municipalities in terms of the flawed, statutory Current Public Transport Records (CPTR). Accordingly, the data they contain are not a reliable indication of the demand for public transport in Gauteng.

The implementation projects contained in some of these plans are mostly planning projects which involve further research and analysis and were, therefore, of little relevance to NATMAP in its search for locally generated infrastructure and services projects of provincial and national significance. The infrastructure projects that were proposed in the 2005/06 plans, such as the Strategic Public Transport Networks (SPTN) were not implementable as long as PRASA and the Province controlled the rail and bus contracts respectively.

NATMAP further stresses the little progress made in the implementation of any of the SPTN rationalised networks while the cities were not in control of the contracts. The only projects to be implemented were piecemeal projects, such as the various bus priority lanes and others which have little hope of success without comprehensive system based, or network approaches to public transport improvements.

Although the NATMAP only provides a summary of the progress made with regards to the state of planning of SPTN's in Gauteng, it offers valuable insights into cross-border transport volumes not addressed in local plans and indicate both the local and long-distance bus and taxi services in Gauteng Province. Important cross-border services to Mpumalanga, North-West and the Free State Province are clearly visible on **Figure 9.1, and Figure 9.2**.

Figure 9.1 - Gauteng Passenger Link Volumes by Bus

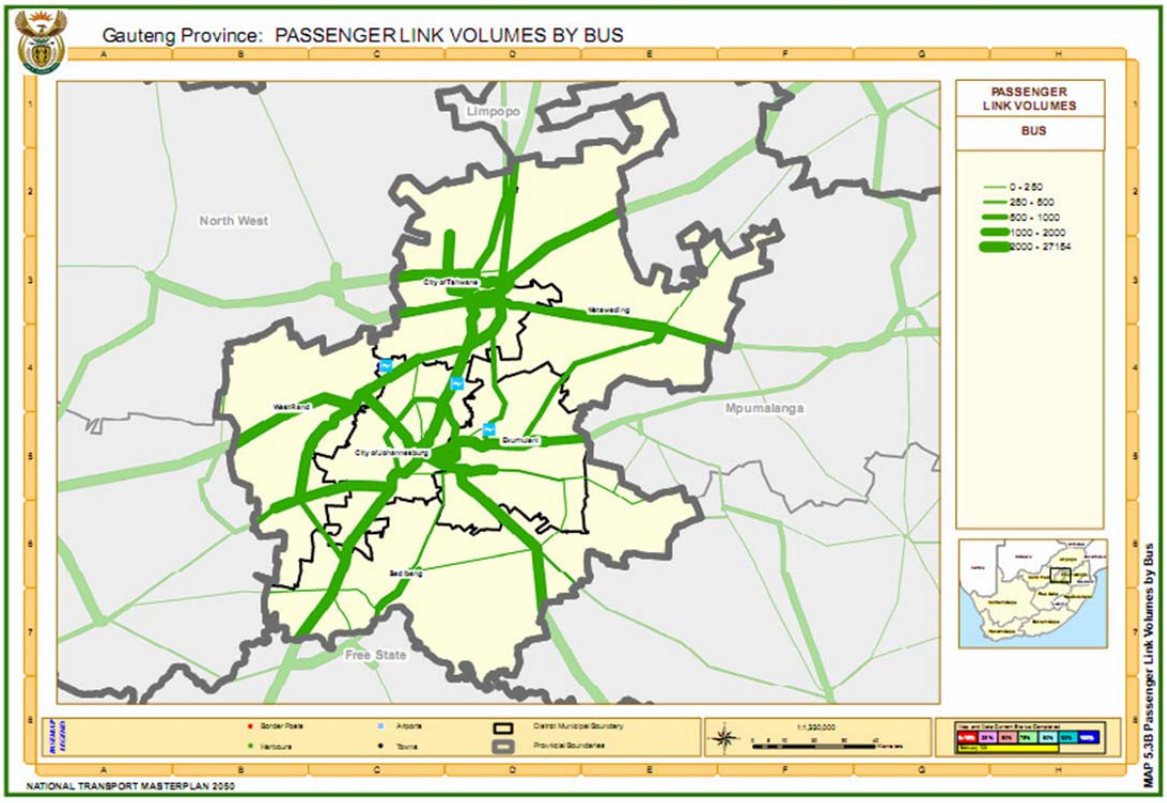
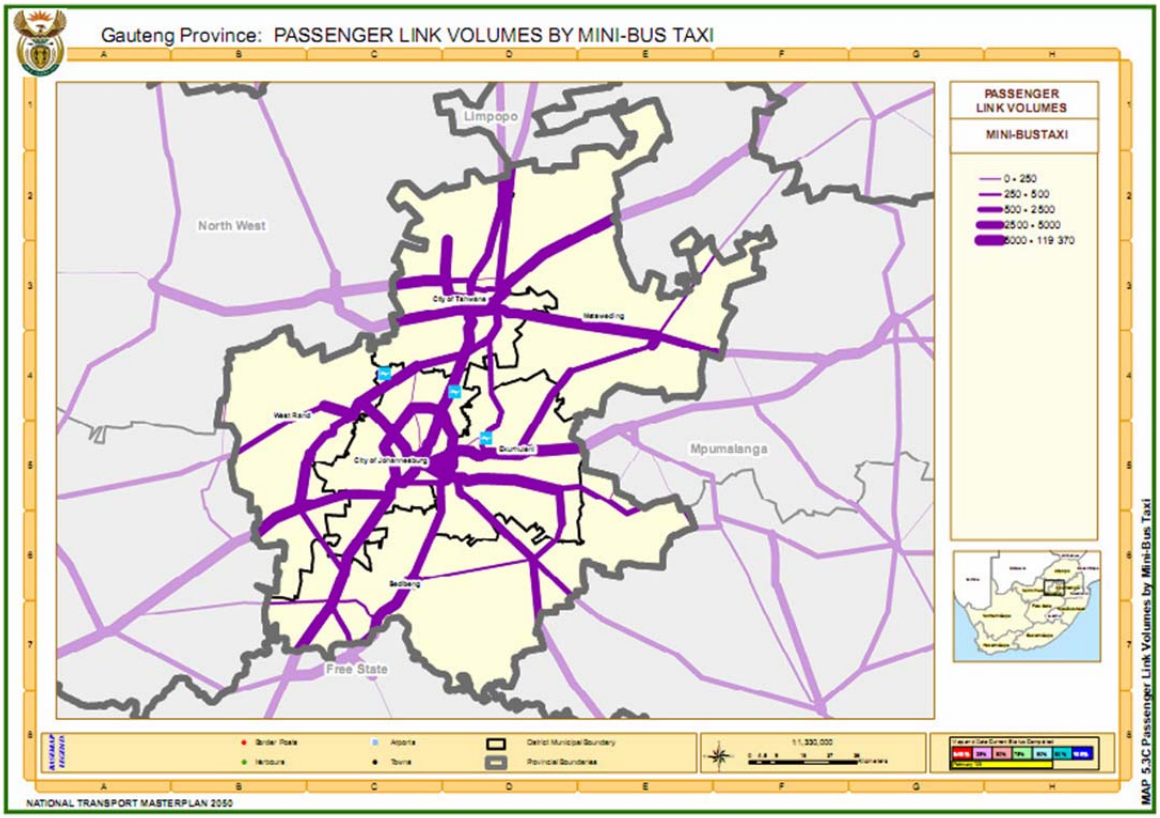


Figure 9.2 – Gauteng Passenger Link Volumes by Mini-Bus Taxi



9.2 Public Transport Action Plan, 2007

The National Public Transport Strategy and Action Plan was approved by Cabinet in January 2007 and aims to address the problems in local and long distance public transport through implementing a Catalytic Integrated Rapid Public Transport Network Projects in up to 12 cities and 6 districts that addresses the need for high quality services that can retain current users and attract new users.

The Action Plan is a high-level plan that supplements the Public Transport Strategy. It maps out the Phase 1 (2007-2010) implementation programme and funding requirements for the next 4 to 7 years. It aims to initiate implementation of catalytic Integrated Rapid Public Transport Network (IRPTN) projects in up to 12 cities and 6 districts at an estimated cost of R12bn over and above the current capital allocations to bus and rail subsidies and the Public Transport Infrastructure and Systems Fund (PTIS).

The Public Transport Strategy has two key thrusts as follows:

- Accelerated Modal Upgrading, which focuses on the 3-7 year transitional period with regard to improving the quality of the public transport fleet and its current operations.
- Integrated Rapid Public Transport Networks (IRPTN) that meet high quality standards with regards to accessibility and coverage - 85% of all metropolitan city residents within 1km of Rapid Public Transport Networks by 2020.

The strategy focuses on Integrated Rapid Public Transport Networks over the 4-20 year period and aims to implement high quality networks of “car competitive” public transport services that are fully integrated, have dedicated rights-of-way and are managed and regulated by a capable municipal transport department. In this regard, the aim is for major cities, such as Johannesburg, Tshwane and Ekurhuleni to upgrade both commuter rail services and bus and minibus services to a Rapid Rail and a Bus Rapid Transit (BRT) level of quality respectively. Ultimately, these services will be fully integrated to form a single system regardless of mode. South African cities and districts are also cautioned to refocus their current Integrated Transport Plans to include the phasing in of IRPTNs.

In order to achieve this, the Action Plan maps out a framework to accelerate the transformation of public transport service delivery in 3 phases:

- Phase 1: 2007-2010 Accelerated Recovery and Catalytic Projects
- Phase 2: 2010-2014 Promote and Deliver Basic Networks
- Phase 3: 2014-2020 Advance and Sustain Accessible Networks

Phase 1: Accelerated Recovery and Catalytic Projects Agenda (2007-2010)

The strategic thrust of this phase is to stabilise the current passenger transport service delivery environment as well as to recover from the accumulated neglect of decades of under-investment. The Accelerated Recovery Plan includes: the completion of network design for all subsidised services, building local sphere capacity in planning, monitoring and network management, acceleration of fleet upgrading, taxi recapitalization and the tendering of bus contracts based on redesigned routes. The Catalytic Projects component is dealt with in the Action Plan's focus on IRPTN Phase 1. The key objective of this phase is an effective public transport implementation platform including Integrated Transport Plans with a focus on Integrated Rapid Public Transport networks.

Phase 2: Promote and Deliver Basic Networks Agenda (2010-2014)

The strategic thrust of this action agenda is to incrementally enhance and expand the passenger transport system through the upgrade of key integrated rapid public transport network corridors, travel demand management measures for car users, and consolidating public transport operators into capable entities.

Phase 3: Advance and Sustain Accessible Networks Agenda (2014-2020)

The strategic thrust of this phase is to incrementally enhance and expand the passenger transport system through large scale implementation including: rolling out fully interconnected mass rapid public transport networks, ensuring most public transport facilities, vehicles and infrastructure are high quality and expanding universally accessible vehicles and infrastructure for users with special needs.

9.3 Gauteng SPTN, 2004

The Gauteng Strategic Public Transport Network (SPTN) was designed within the context of the Gauteng Global City Region initiative and the GDRT's Public Transport Strategy and Action Agenda. The Gauteng Strategic Public Transport Network for Gauteng (SPTN) is a network of planned mass public transport trunk routes (road and rail). The SPTN sets the parameters and standards for all operators, whether public or private. The GSPTN is not the sole responsibility of Provincial Authorities. Its success is dependent on the local authorities aligning their programs and policies to the requirements as set out in the GSPTN. The main aim of the GSPTN is to provide:

- A Strategic framework for planning and improving public transport in the province
- A vision to develop a network of public transport corridors, routes and areas where land use development should be planned and managed in such a way as to support public transport services and operations
- A broad provincial urban structure with a strategic public transport network leaving it to local authorities and other service providers to undertake the more detailed planning.
- The opportunity to expand the network in future should the urban structure of the province expand

The Gauteng Province‘s Public Transport System comprises two main components: The SPTN and the Expanded Public Transport Network (EPTN).

- The SPTN provides a framework for public transport in Gauteng based on major regional movement needs. These two components are functionally linked to one another and in combination comprise a system of public transport for Gauteng as a whole. The SPTN comprises a rail component supplemented by roads. It is a provincial and national responsibility and it provides a framework for public transport in Gauteng based on the major regional movement needs.

- The EPTN on the other hand comprises predominantly road infrastructure supplemented by rail sections. It is primarily the responsibility of local authorities to design and implement the EPTN for their respective areas.

The SPTN routes link the main generators (residential areas) with job opportunities and social and retail services (attractors), focusing both on the existing public transport market, as well as on car users who could be attracted to use public transport. The main generators and attractors have been designated as nodes on the SPTN. **Figure 9.3** indicates the Gauteng Strategic Public Transport Network.

9.4 Integrated Public Transport Action Plan, 2007

The intention of the Strategic Action Agenda for Gauteng is to confirm the Province’s role in the transport milieu and to elaborate on its implementation program for public transport in the immediate, short, medium and long term. The Strategic Action Agenda for Transport is considered to be the Provincial Transport Planning Framework for the next 5 years which is to be reviewed annually so as to take into account the changes of the dynamic Gauteng context.

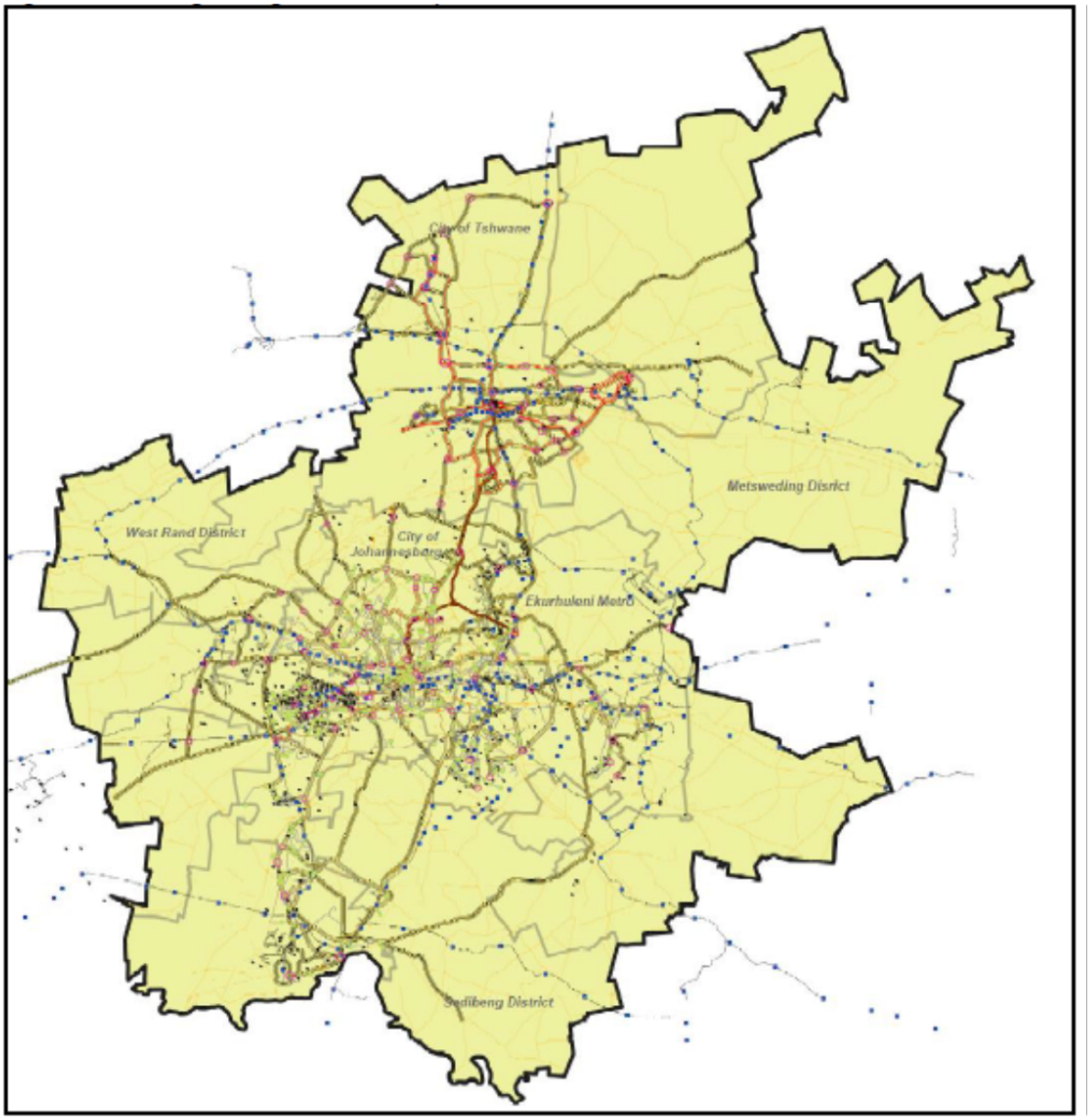
The document further provides the policy, strategy and operational guidelines that need approval from the Department of Transport so as to enable Gauteng to effect the required changes and operational approvals in a comprehensive manner rather than having to obtain piecemeal approval per public transport subsidy application.

The Gauteng Strategic Action Agenda for Transport has taken a number of approved strategic policies and programmes, integrated them and elaborated on an action plan for the next five years the focus being on facilitating and coordinating public transport management – a Provincial competency in terms of both the Constitution and the National Land Transport Transition Act. The overall aim of the document is to obtain approval for the Strategic Action Plan: 2007, with the premise that it becomes the basis for implementation of all public transport subsidized contracts.

The focused objectives of the Gauteng Strategic Action Agenda include:

- To ensure the furtherance and implementation of efficient and effective intermodal transport in an integrated manner in order to further the objectives of the Global City Region.
- To obtain approval of the Gauteng Strategic Public Transport Network (SPTN) and its operational guidelines as the basis for the evaluation and provincial approval for all subsidized public transport systems. This means that there will be one approval from DOT of the SPTN, its operational plan and the implementation timetable, after which monitoring an implementation will take place at regular intervals, and will be reported to National. The focus of this reporting will be in terms of compliance with the parameters of the Public Finance Management Act and Treasury Regulations.
- To utilize as a basis for securing funding both nationally and internationally for the medium to long-term implementation of public transport investments.
- To be the basis for the operation of the Gauteng Transport Management Authority and the related consultative structures.
- To be the evaluation tool for all current and future transport modes across Gauteng, as well as for future technological advances in the transport industry.

Figure 9.3 – Gauteng Strategic Public Transport Network



In conclusion, the document highlights Gauteng's' different approach to the implementation of National Passenger Transport Plan, due to the development intensities in the Province, the collective decision to the establishment of the Gauteng Transport management Authority and due to Gauteng being defined as a Global City Region, namely:

- The Transport Authority is being established at Provincial level in Gauteng;
- Integrated transport is the primary focus but it includes all modes, not just road transport.
- The Gauteng Strategic Action Plan has already established the framework for implementation and therefore implementation is to be initiated with immediate effect.
- All operators, whether private or public (in the form of the local authorities) will be required to comply with the new operating parameters.
- This implementation plan will address all modes in the short term with focus on bus and taxi transformation and how to extend the subsidies to the taxi industry in Gauteng.
- The medium term will focus on the integration, promotion and improvement of the rail sector, ensuring the promotion of new technologies and innovations in efficiency.
- Finally, a further medium term action plan will be the design and implementation of integrated, intelligent transport systems across Gauteng, in accordance with the principles and performance standards.

9.5 Gauteng IPTN, 2009

The purpose of the IPTN Design Report is to provide a report on the development of an Integrated Public Transport Network (IPTN) for Gauteng. The report focuses on the IPTN's for the following areas:

- City of Tshwane Metropolitan including the Metsweding District Municipality;
- West Rand District Municipality;
- City of Johannesburg Metropolitan Municipality;
- Sedibeng District Municipality

In 2006 and 2007, the national Department of Transport (DOT) developed the Public Transport Strategy and Action Plan which introduced and set out the Action Agenda for implementing Integrated Rapid Public Transport Networks (IRPTNs). Simultaneously, the Gauteng Department of Public Transport, Roads and Works were developing the Gauteng Integrated Strategic Public Transport Network (GISPTN) as the basis for its detailed IPTN designs.

In July 2008 it was agreed by DOT and the GDPTRW that: IPTN designs, carried out according to DOT Guidelines, would be completed for Joburg, Tshwane, West Rand and Sedibeng by July

2009. Implementation of these IRPTN designs was supposed to be phased in from 1 April 2010. Hence, there would be a 10 month period from 1 July 2009 to 1 April 2010 for the approval of the designs and implementation programme. Ekurhuleni Integrated Network Designs and funding applications would follow a year after the other Gauteng municipalities.

The IPTN should be viewed in the context of the GSPTN and followed the same principles as guided by the GSPTN:

- Road-based public transport corridors should be located on arterials and main roads rather than freeways, with generators/attractors on both sides and ends of the route. This is to try to maximize the number of people who can access the GISPTN by walking, as well as the potential for passenger turnover along the route.
- The SPTN should be kept as direct as possible to minimize travel times and maximize the potential for road-based public transport priority measures such as dedicated bus ways, public transport lanes, priority traffic signals, and so on.
- The SPTN should have integrated public transport facilities at all nodes to allow for transfers between modes.
- Public transport services should be provided by the appropriate mode for the demand
- A system of feeder and distribution routes serving the SPTN trunk routes to ensure maximum geographic and network coverage.
- Frequent and rapid peak and off-peak services between major origins and destinations on the SPTN provided by the appropriate mode for the corridor demand.
- Sufficient vehicle capacity to prevent overloading and long queues.

The Gauteng IPTN Design Report also highlights the timeframes as set out in the National Public Transport Action Plan for the implementation of the IPTN designs in Gauteng as part of its first phase:

- Completion and costing of working IPTN designs for Joburg, Tshwane, West Rand and Sedibeng: July 2009
- Application to Treasury for 2010/11 funding: July 2009
- Expansion of West Rand design to include Merafong, September 2009
- IPTN designs for Ekurhuleni: July 2009 – July 2010
- Conversion of interim contracts to km-based short-term contracts: September 2009
- Discussion and approval of working IPTN designs with municipalities and DOT: July - November 2009
- IPTN Implementation Roadmap: February 2010
- Phased implementation of IPTN designs: April 2010 - March 2014 (during this period the km-based short-term bus contracts will be converted to IPTN contracts).

9.6 Gauteng IPTN Review

A study for the Gauteng IPTN review and the inclusion of Merafong and Metsweding had been commissioned, but only has an anticipated completion date of July 2012.

9.7 City of Tshwane BRT Operational Plan 2008

The City of Tshwane developed and approved a full Operational Plan for implementing the proposed road-based public transport system in Tshwane in 2008. The plan was to provide an integrated package of measures with the emphasis being on the provision of a Bus Rapid Transit (BRT) system for the Tshwane metropolitan area. The mandate for the development and implementation of the BRT Operational Planning was a solution to providing mass transit within a limited timescale was provided by the Council following the Scoping Study undertaken in 2007.

In the development of the proposed BRT system, a layered approach to the network planning was adopted, with the existing rail system at the top of the hierarchy of modes, followed by the proposed BRT system, enhanced bus corridors and then feeder or distributor services.

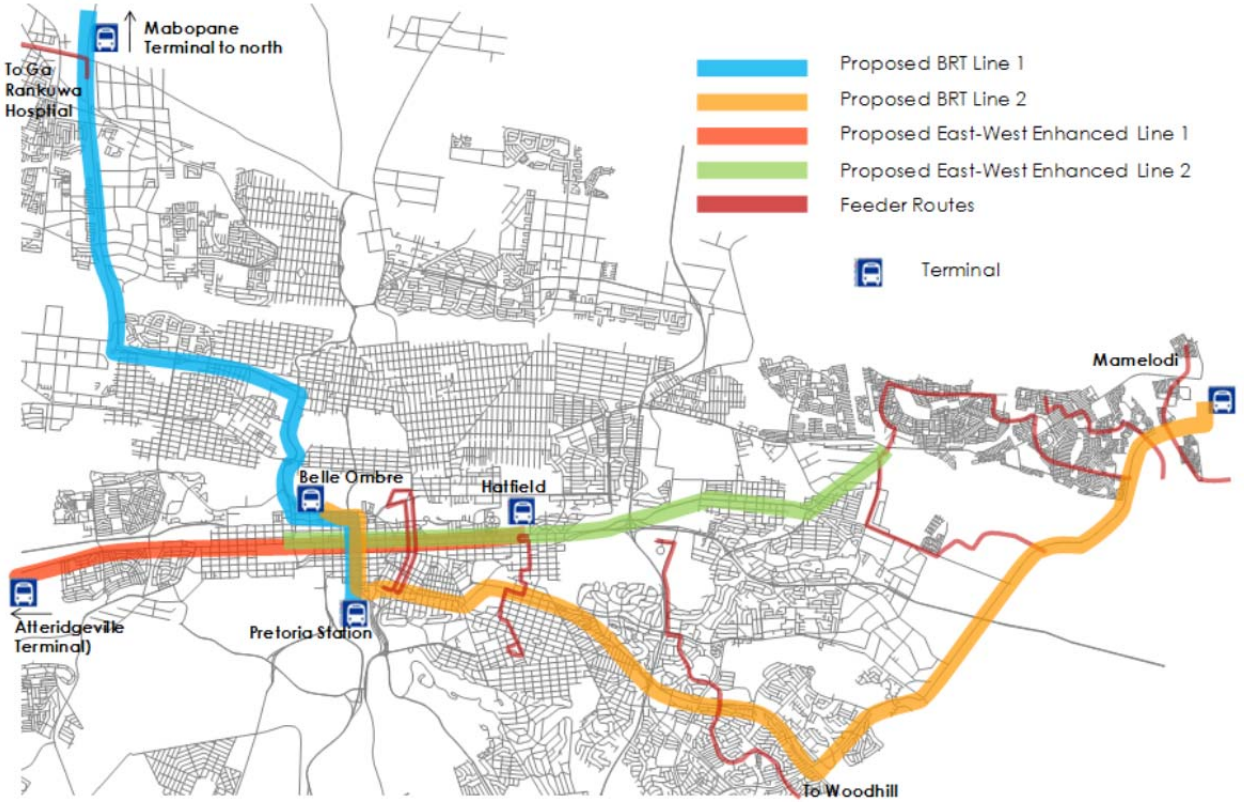
The Operational Plan identified the implementation of Tshwane's BRT in Phases, with the proposed system for Phase I consisting of BRT and enhanced route corridors as can be seen in **Figure 9.4**.

- Line 1 Bus Rapid Transit route between Mabopane and Pretoria Station
- Line 2 Bus Rapid Transit route between Belle Ombre Station and Mamelodi
- Line 1 Enhanced bus corridor on Church Street between Atteridgeville and Hatfield
- Line 2 Enhanced bus corridor on Church Street between DF Malan and Mamelodi
- Feeder routes to provide access to the BRT services

Although the Operational Plan was approved by the City of Tshwane, it was questioned by the National Department of Transport with regards to its routes being competition to rail by running parallel to existing rail services, trunk routes running on the R80 Mabopane Highway that was deemed inaccessible, high cost of infrastructure associated with the design and the need for extra work to be done regarding the CBD linkages.

The 2008 Operational Plan was subsequently reviewed, leading to the formulation of the new Operational Plan in 2012.

Figure 9.4 - Original Tshwane BRT Phase 1



9.8 City of Tshwane Draft IRPTN Operational Plan, 2012

Building on to the previous Tshwane Operational Plan, and other studies that have identified a requirement for a link from Mamelodi in the east to the Pretoria CBD, and from Mabopane in the north to the CBD, the 2012 Draft Operational plan identifies these routes as projects that must be delivered early in the development of the BRT Project for the CoT.

The Draft IRPTN Operational Plan identifies the following priority corridors:

- Northern corridor from the CBD towards Mabopane. The BRT Line 1 (Northern Corridor) route originally followed a route from Paul Kruger Street to DF Malan and the R80 terminating in Mabopane. This route was subsequently amended by the BRT Line 1 Review Report approved by Council in 2010 to run from Paul Kruger Street to Rachel De Beer, Akasia, Doreen and terminate in Soshanguve.
- Eastern Corridor to Mamelodi via Hatfield and Menlyn. The BRT Line 2 Route has in general followed a route south-west from Mamelodi towards Lynnwood, Hatfield, Brooklyn and the CBD. This route was finalised in the BRT Line 2 Review Report and approved by Council in April 2012.

- Future Extensions during phase 2-4 includes services to Centurion, Atteridgeville, Mamelodi via Zambezi and Hans Strijdom Drive.

Figure 9.5 indicates the Tshwane IRPTN Route network as included in the Draft 2012 IRPTN Operational Plan.

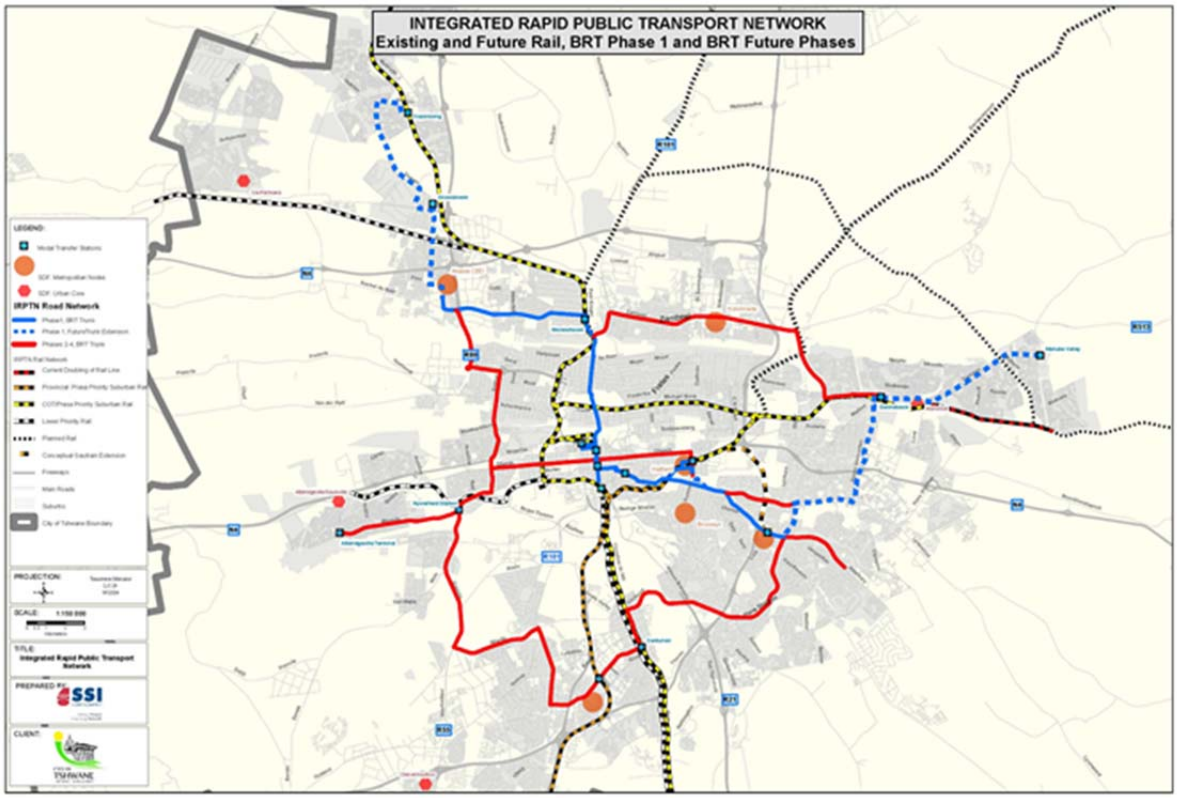
The 2012 Draft IRPTN Operational Plan also identifies complimentary services from Kopanong to Akasia and Menlyn to Denneboom should financing be available.

The planning of the Phase 1 BRT system as part of the IRPTN has focused on the detailed development of the alignments of BRT Lines 1 and 2. The development of these lines was influenced and informed by a several factors as follows:

- The overall passenger demand (public and private) in the main movement corridors;
- The need to not only service the main corridor movements (i.e. longer trips) but also the residential and employment suburbs along the main corridors (i.e. shorter trips);
- The integration of the existing and new modes making up the IRPT network;
- The suitability of the road infrastructure along the corridors to provide the exclusive trunk bus lanes, stations and passing lanes at stations;
- The current and future land use proposals along the corridors;
- The comments and concerns of the Departments of Transport (DoT) and National Treasury in regard the original BRT system designed in 2009 and 2010.

The proposed project phasing has construction of Phase 1A (CBD to Hatfield) to start in August 2012, with the phase “going live” in August 2014. The completion date for the complete phase 1 is currently scheduled for January 2016, with full phase 1 operating from April 2016. At time of writing, the status of this Draft Operational Plan was not known.

Figure 9.5 - Tshwane IRPTN Planned BRT Network



9.9 City of Joburg BRT Operational Plan

The City of Johannesburg adopted BRT in principle as its long-term mass transit solution in November 2006. The first construction contract was signed in September 2007. The first Rea Vaya buses began operating in August 2009. The Operational plan for Phase 1 was developed in three phases, with a brief investigation conducted at the long term, full Rea Vaya System:

- Phase IA: Planned completion by April 2009, 25 kilometers
- Phase IB: Planned completion by April 2010, 63 kilometers
- Full Phase I: Completed by 2013, adding an additional 122 kilometers of routes to the network.
- Full Long Term Rea Vaya BRT System: 2020 and beyond

Figure 9.6 shows the full 122 km Phase I Rea Vaya Trunk system. On all of these roads, physically segregated bus lanes need to be constructed. In addition, 150 special prepaid boarding stations need to be constructed and eight terminal stations. Phase I also requires the construction of six bus depots.

Corridors for the complete long term Rea Vaya BRT system have been identified but the service plan has not been detailed.

Figure 9.7 shows the 330 kilometers of trunk corridors that should all be included in the long term full Rea Vaya BRT system plan based on demand levels and upon the Strategic Public Transport Network developed by the City of Johannesburg.

Figure 9.6 - Rea Vaya Full Phase 1 Trunk, Feeder and Complimentary

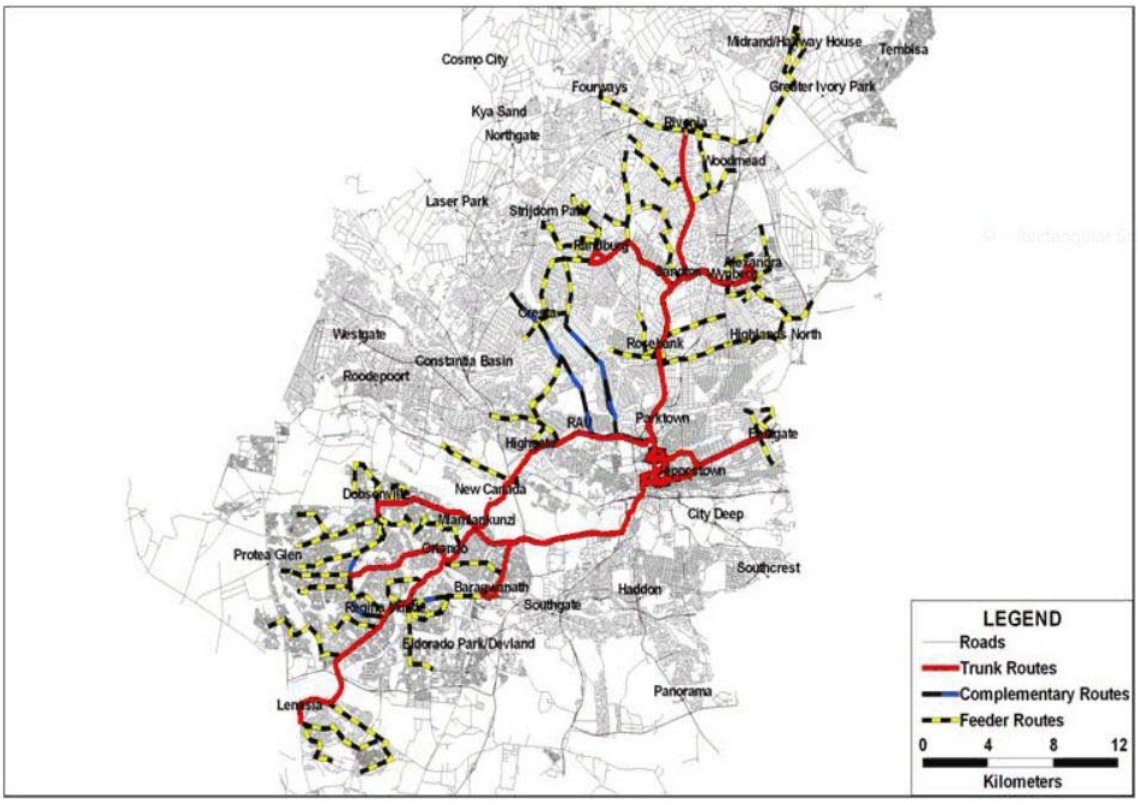
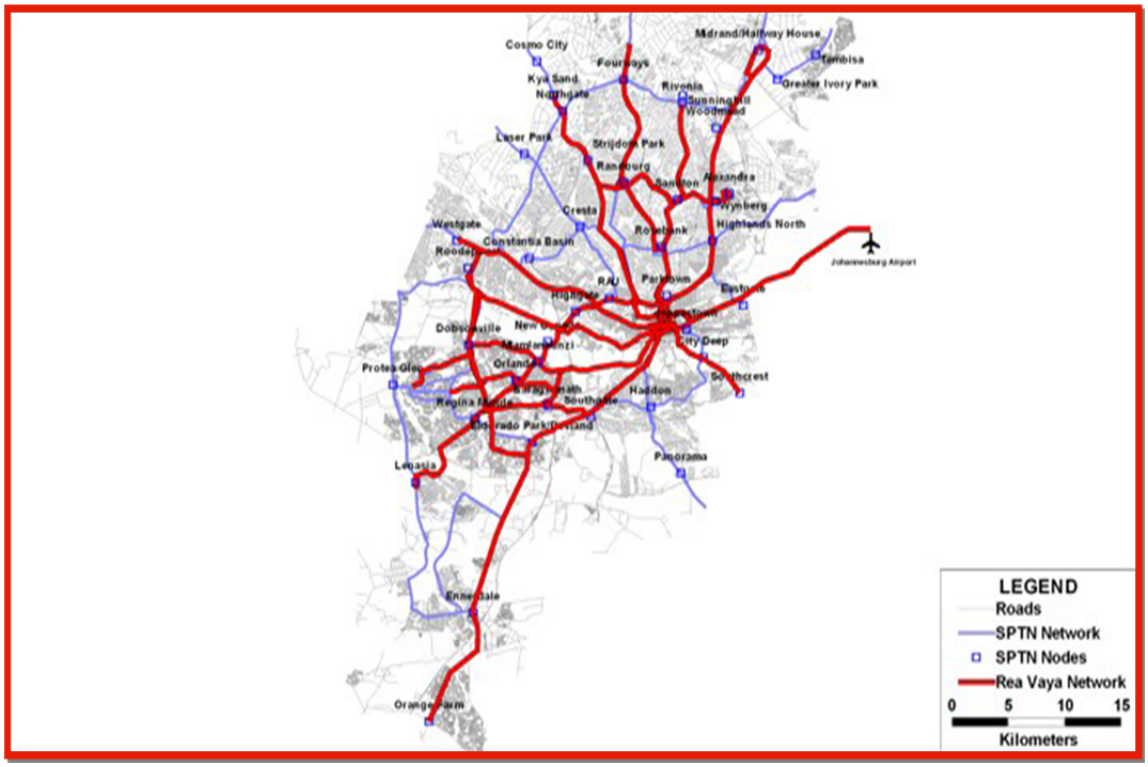


Figure 9.7 - Full Future Rea Vaya Network approved in November 2006



9.10 Ekurhuleni Modal Integration Study, 2008

The Ekurhuleni Modal Integration Strategy was completed in 2009 and analyses the entire Ekurhuleni Public Transport System, including the BRT routes as identified in the IRPTN Scoping Study. The study identified the need for a pilot project for Modal Integration in the municipality, to be implemented on a planned BRT Corridor

The short term approach of the pilot project was aimed to improve safety and security (day and night), improve access to stations (local and regionally), upgrade existing facilities, improve pedestrian linkages between existing facilities and the station, as well as between the station and the surrounding attractions, include non-motorized transport paths and facilities, and to improve operational efficiencies between the existing modes.

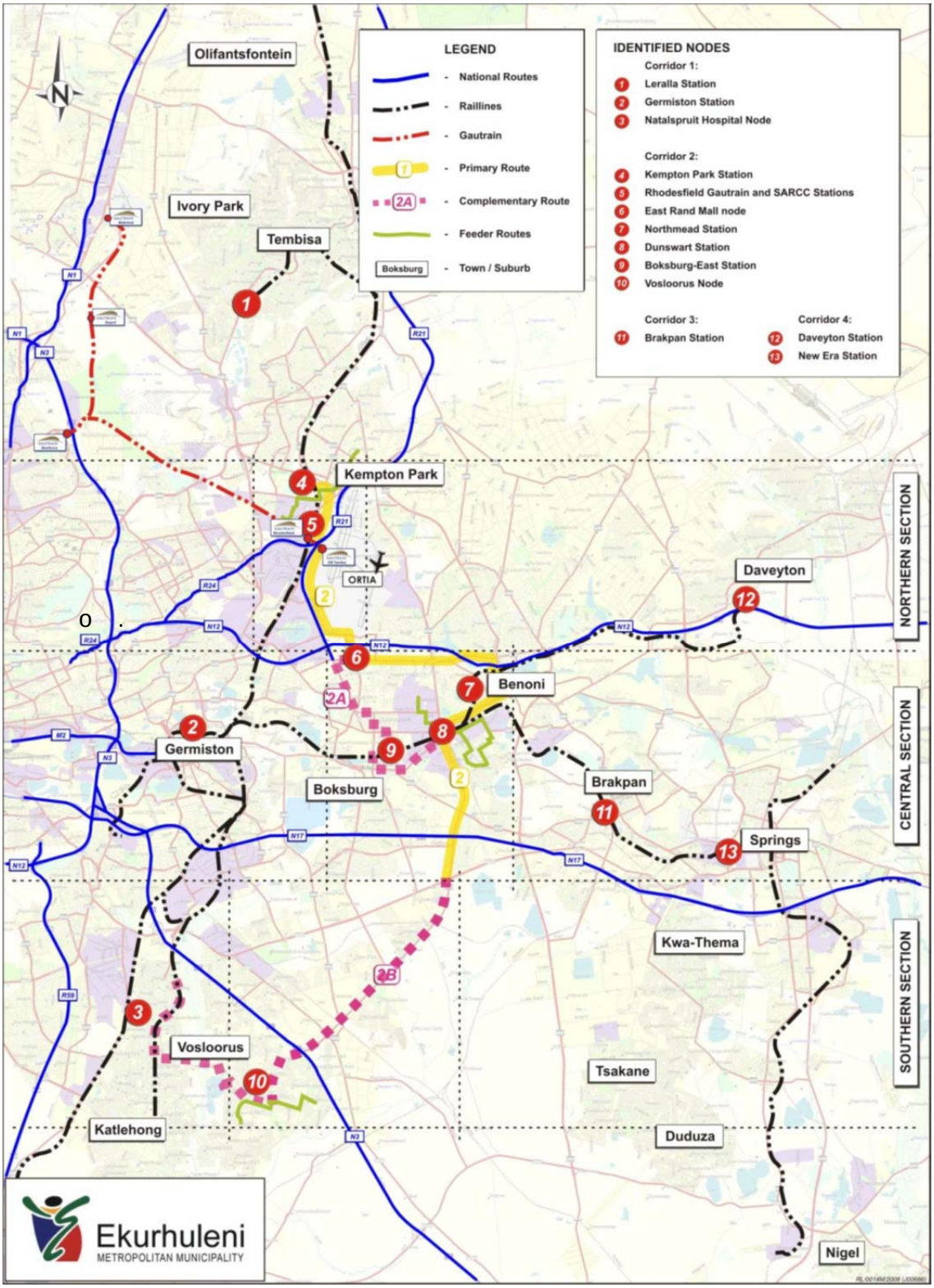
The medium and longer term focus is to incorporate Rapid Public Transport (RPT) in such a way that it would complement and integrate with the commuter rail components of the IRPTN. In the first phase this is to be introduced by prioritized bus and mini-bus taxis by dedicating lanes for their exclusive use.

From the routes identified in the Scoping Study, the Modal Integration Study chose Route 2 for implementation because it connects to major economic nodes in the area as well as different transport services such as PRASA stations, the OR Tambo Airport and Gautrain. The timeframe for the implementation of the project was estimated to be 30 months. **Figure 9.8** below indicates the route chosen to implement as a pilot project.

The current progress with regards to the implementation if the Ekurhuleni IRPTN can be summarized as follows:

- Chosen Route 2 (phase 1) was put out to tender in June 2010.
- Scope includes a basic confirmation of the full future BRT network with the 5 routes as well as detailed investigation of Route 2 (Phase 1) for implementation
- EMM is now consulting on Phase 1 of the BRT systems and the following program will follow after the approval:
    - EIA processes on Phase 1
    - Detail Design – Phase 1 A
    - Construction

Figure 9.8 - Modal Integration Pilot Project



9.11 Ekurhuleni IRPTN Scoping Study, 2012

The Ekurhuleni IRPTN Scoping Study and Implementation Framework was completed in 2008 with the aim to articulate the vision and steps required to implement a public transport system that integrates all modes into a seamless and high-quality network. The development of such an Ekurhuleni Integrated Rapid Public Transport Network (IRPTN) was deemed particularly crucial to meeting some of the City's obligations in providing transport facilities and services to the people of the city.

The overall goal of the initiative is to improve the quality of life for the city's residents through the provision of an integrated public transport network that is rapid, safe and secure, convenient, clean, affordable, and socially equitable.

The scoping study aimed to identify the actions required to:

- Provide a full network covering the expanse of the Ekurhuleni Metropolitan Municipality (EMM) with appropriate services based on rail, road, and non-motorised options
- Assure actual implementation of the system within the necessary time frames
- Deliver a system of sufficiently high quality that will both attract existing car users and greatly enhance the travel experience of current captive public transport customers.

The findings of the IRPTN scoping report can be summarized as follows:

- BRT Route selection was based on SPTN and demand for road-based services.
- Routes were adjusted to ensure maximum protection for existing and planned rail services.
- BRT routes also planned to serve changes in land use patterns of over the last four decades, areas that had grown and developed since the last implementation of rail infrastructure

The following routes were recommended for the development of trunk road services in project Phases 1 and 2 as can be seen in **Figure 9.9**.

- Phase 1: runs from Ivory Park and Tembisa in the north to Germiston and from Katlehong in the South to Germiston via Alberton. The total length of this route is 44.55 km.

- Phase 2: runs from its origin in Kempton Park at its junction with the Phase 1 Route, through Kempton Park to OR Tambo IA and thence to Benoni via Boksburg North and finally southwards through Boksburg towards Vosloorus. Route 2 has a length of 36.39 km.
- Phase 3: runs from OR Tambo IA to Germiston.
- Phase 4: runs from Kempton Park to Kwatsaduza via Benoni and Brakpan with a southerly spur to Germiston, intersection with the Phases 1 and 2 routes.
- Phase 5: runs from Daveyton to KwaThema

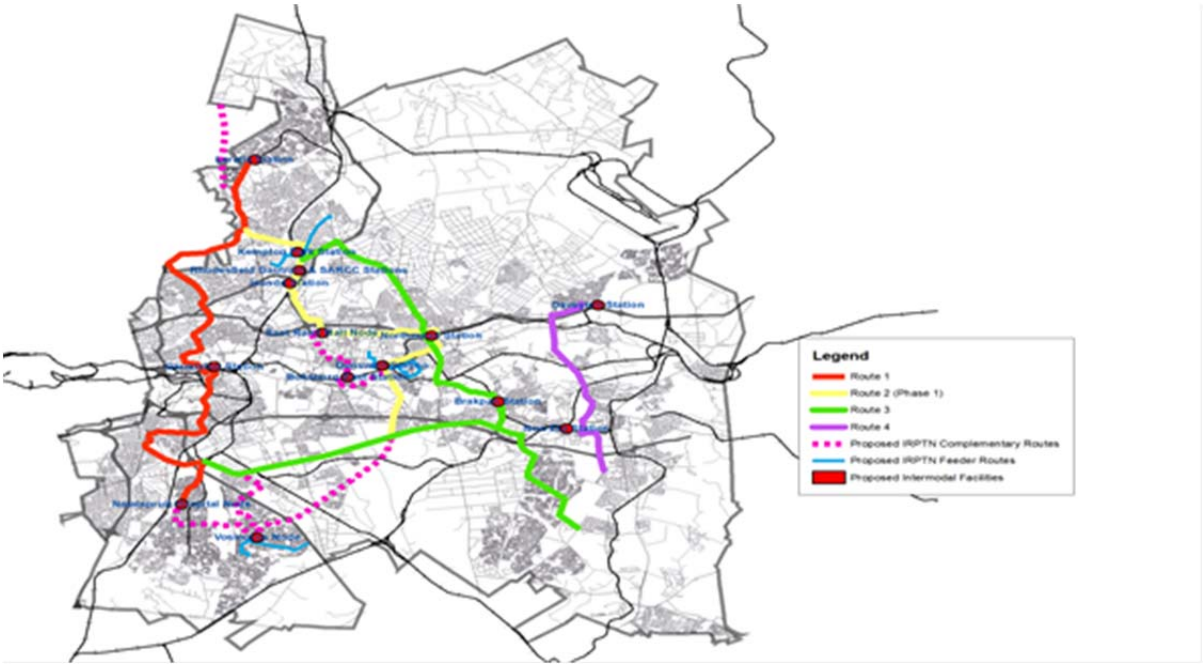


Figure 9.9 - Proposed Phases BRT network in Ekurhuleni

9.12 West Rand District Municipality DITP, 2009

The West Rand District municipality 2009 DITP was reviewed for the period 2010 to 2014 in order for the municipality to adhere to legislation. The Current Public Transport Record (CPTR) and Operating Licensing Strategy (OLS) for the region were due to budgetary limitations, restricted to origin-destination and corridor counts and did not allow for comprehensive area-wide coverage for deviation of commuter patterns. In addition to the above, it must also be noted that the Integrated Transport Plan did not cover Merafong City LM, the latter municipality which was re-demarcated into the area of jurisdiction of the West Rand District Municipality during 2009.

In order to adhere to the new regulations, a revised District Integrated Transport Plan was compiled for the West Rand during the period June 2009 – 2010 to include Merafong City LM and Local Transport Plans were also prepared for four local municipalities of Mogale City, Merafong City, Randfontein and Westonaria. No new CPTR data or OLS Strategy were

compiled as these arrangements are being held in abeyance, pending the alignment thereof with the envisaged Public Passenger Strategic Network for the West Rand

The DITP identifies public transport as a problem in the municipality, stating that Public transportation initiatives are not focused around a specific implementation plan. Public transport projects and public transport infrastructure are implemented on an ad-hoc basis. The DITP advocates the proclamation of a Primary Strategic Public Transport Network (PSPTN) for the West Rand District Municipality and urges the identification of pilot implementation corridors.

In addition to this, feeder systems connecting into the PSPTN are needed, and the need to proclaim a Secondary Strategic Public Transport Network (SSPTN) for the West Rand District Municipality is highlighted.

9.13 Sedibeng District Municipality IPTN Design Report and DITP

In July 2008 it was agreed by DOT and the GDRT that Integrated Rapid Public Transport Network (IRPTN) designs, carried out according to DOT Guidelines, would be completed for Sedibeng by 1 July 2009. The following principles were adopted in the IPTN design process for Sedibeng:

- Where applicable, the existing heavy rail, Bus Rapid Transit (BRT) and Gautrain rapid rail systems were considered as critical components of the revised networks and input into the model. The services proposed for the BRT and Gautrain systems were not altered, and the revised road-based routes were integrated with these new services.
- A ‘clean slate’ approach was adopted and all existing bus and taxi services were not considered in the design process. There are a large number of bus and taxi services currently operating in Sedibeng. Early investigations found that it was extremely difficult to alter and change these routes on an individual basis and that it posed several risks:
  - By modifying the existing modes and routes, there was the risk of emphasizing and entrenching the status quo, which was not considered desirable;
  - The need for the integration of BRT and Gautrain services are not reflected in the existing routes and services;
  - The existing services do not reflect mode efficiencies, i.e. cost, capacity and travel distance efficiencies; and
  - The need to consider the cross-boundary movement of services and passengers was a key consideration in the revised networks.

A total of 26 routes have been identified, 3 of which are suitable for articulated buses, 17 of which are suitable for standard buses, 3 for minibuses and 3 for minibuses. The IPTN design report also stresses the strong cross-boundary passenger movement between Sedibeng and Joburg, as well as cross-boundary movements between Sedibeng and Ekurhuleni and West Rand. All of the 3 articulated bus routes provide cross boundary services. The timeframes associated with the implementation of the ITPN designs were in line with those proposed by the National Public Transport Action Plan. At time of writing, no network maps were available.

This current District Integrated Transport Plan (DITP) is the officially Council adopted Transport Plan for Sedibeng applicable to the planning period 2008 to 2013. The DITP stresses the necessity of the Municipality to support Gauteng Province with finalising the main public transport corridors for Gauteng (including Sedibeng) - Integrated Public Transport Network Design project.

9.14 Nkangala District Municipality CPTR

The 2008 Current Public Transport Records of Nkangala District Municipality highlights the significant cross-border movements of passengers from the District into the Gauteng Province. The major cross-border movements for Nkangala that needs to be noted are:

1. Major bus routes include the Moloto to Pretoria route (carrying about 35 000 passengers per weekday (one direction only) and Pankop to Hammanskraal route (carrying about 3 000 passengers per weekday (one direction only));
- The highest occurrence of work trips across a district boundary was from Nkangala District Municipality to Gauteng (5.3% of all work trips in the province).

A total of 6.2% of all work trips originating in Mpumalanga is destined for Gauteng.

9.15 Assessment of the Current PT Planning

From the paragraphs above it is clear that an extensive amount of public transport planning work had been done over the past decade or so. However, some of the planning is already dated, has been over-taken by other planning initiatives and is therefore not that relevant anymore. (An example of such planning is the public transport planning for Gauteng contained in NATMAP, 2010).

An assessment of the public transport planning is given in general terms in the following number of paragraphs. This section is concluded with a discussion on public transport modal specific planning.

9.15.1 Planning Coordination

The planning of public transport networks and services are “spread” across a whole variety of government spheres, agencies and entities. Planning is also often done in modal “silos”, whereby:

- High-speed rail planning is done by National DoT,
- Commuter and long-distance rail is done by PRASA,
- Gautrain rail and feeder bus services by the Gautrain Management Agency (GMA),
- Integrated Rapid Public Transport Networks (IRPTNs) or BRT by metropolitan authorities,
- Subsidised commuter bus services by the Gauteng Department of Roads and Transport,
- Subsidised scholar transport managed (but not really planned) by the Gauteng Department of Education,
- Municipal Bus Services by the municipal bus operators, and
- Mini-bus Taxis services by operators and associations.

Transportation planning done by the municipal sphere of government, such as the Integrated Development Plans (IDPs), Integrated Transport Plans (ITPs) and Integrated Public Transport Networks (IPTNs), is very much inward focussed. Public transport network and service proposals and projects proposed in most instances are limited to within local geographical boundaries. Very little attention is being given to travel across municipal boundaries, whereas a significant amount of passenger transport happens across both municipal and provincial boundaries within the greater City Region.

The latest Gauteng IPTN has to some extent attempted to address the matter of travel across local boundaries. However, due to a lack of effective planning coordination, some gaps and proper integration between networks and services still exists in many instances.

Post 1994 structures were established (mainly through the Technical Coordination Committee and its working groups), to facilitate better planning coordination and this taken further as part of the activities of the Gauteng Transport Management Agency (GTMA). However, since the Agency is not in existence any more, effective coordination in public

transport across modes and government entities planning is lacking. In turn, this is hampering effective public transport integration.

The NLTA, 2009 makes provision for every municipality that has established an integrated public transport network or has significant passenger rail services in its area to establish Intermodal Planning Committees, with the aim of coordinating "public transport between the modes". The City of Joburg is currently the only municipality in Gauteng that has established such a committee which meets on a 3-monthly basis. However, this committee largely only acts as a forum for sharing planning information, but it has very little power to "influence" planning decisions and processes.

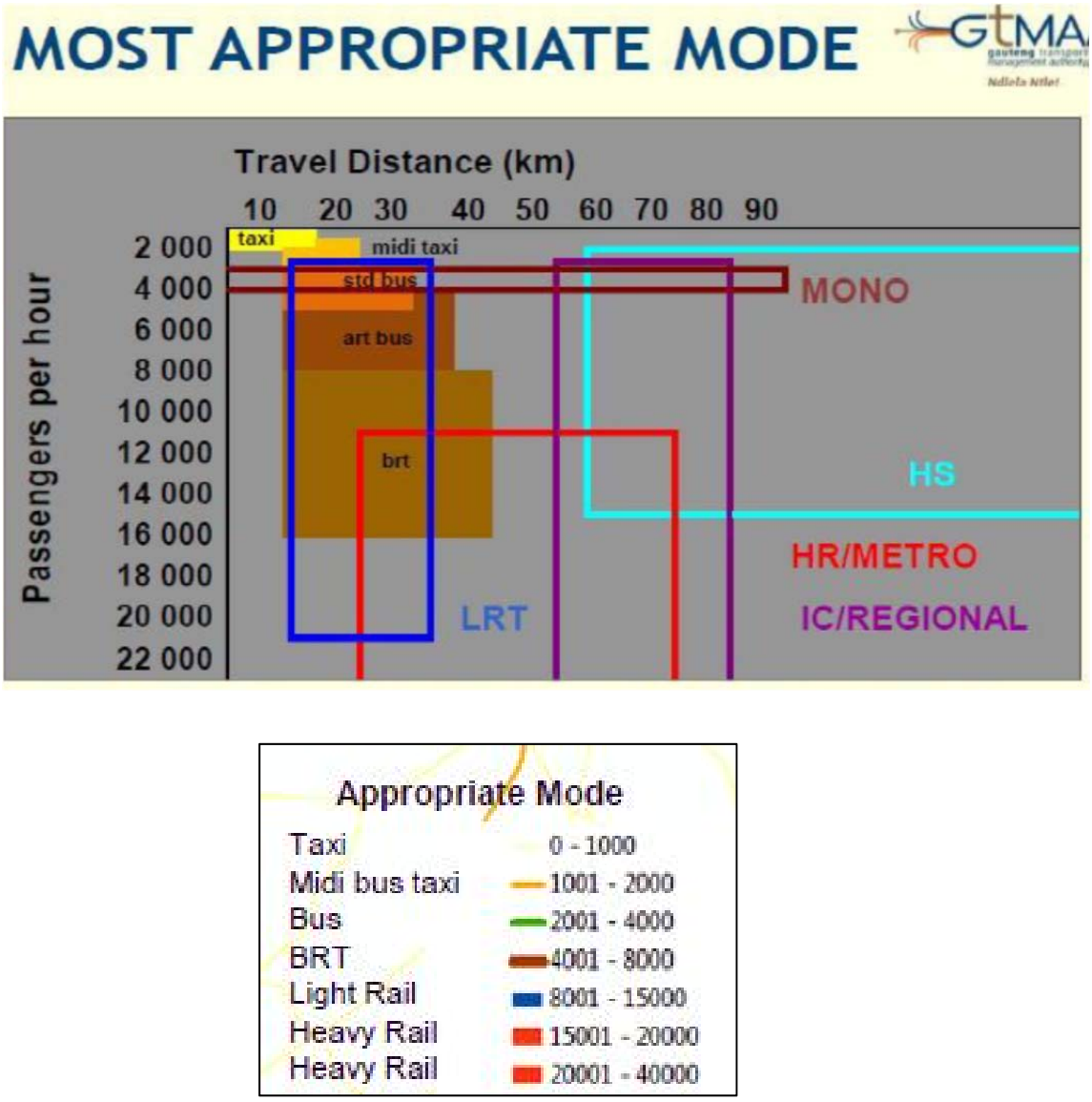
9.15.2 Network Approach

Similar the planning of road networks, a network approach should be followed when planning public transport systems, adhering to *inter alia* the principles of **network hierarchy** and **network continuity**.

Firstly, the principle of network hierarchy talks to function of specific links or corridor in an integrated public transport network and the levels of mobility and accessibility required by passengers travelling along a specific network link or corridor. This is directly related to the "role of modes" consideration and the most appropriate public transport mode to be deployed along a certain network link or corridor. By way of example, an urban freeway provides a high level of mobility and through-put, as well as a low level of local access to private vehicles, whereas a metro rail type of system fulfils the same type of function from a public transport facility perspective, where access is only provided at stations. Similarly, a collector road provides a fairly low level of mobility and a high-level of local accessibility, which is comparable with the commuter bus or mini-bus taxi public transport modes, where stop spacing is fairly close.

Figure 9.10 illustrates the hierarchy and role of modes well from a public transport networks and services perspective.

Figure 9.10 – Hierarchy of Public Transport Modes



Most of the existing public transport plans for Gauteng accept the commuter rail system as the “back-bone” of the public transport system. However, given the evolution and the success of Bus Rapid Transit (BRT) throughout the world (and more specifically in the third world and developing city regions) in the last decade of the previous century, BRT was seen as the solution to meet most urban public transport system requirements. BRT was and is still in many quarters seen as the solution to meet most urban public transport system requirements. This was further reinforced by the national Public Transport Action Plan and the associated Public Transport Infrastructure and Systems Fund. Where BRT provides for a good balance between mobility and access with “medium” through-put in passenger volumes, BRT systems are only being envisaged as appropriate solutions, whereby rail or other types of commuter bus (i.e. express bus on separate right-of-way) may be more appropriate in certain instances.

Thus, in terms of public transport planning done at the metropolitan government spheres in Gauteng identified Strategic Public Transport Networks (SPTNs) as part of their initial Integrated Transport Plans (ITPs). This evolved to Integrated Rapid Public Transport Networks (IRPTNs) during the refinement of certain sections thereof. This now means that the restructuring of public transport and the implementation of SPTNs is largely if not solely focussed on BRT, to the detriment of other modes. This is further aggravated by the planning of dedicated services, with the sole purpose of feeding BRT trunk lines, not being public transport services "in their own right" and bringing about further inefficiencies. If secondary and tertiary or lower networks were planned to the same level as BRT, roles for commuter bus and mini-bus taxi will be forthcoming.

Secondly, the principle of network continuity addresses the ability for passengers to travel throughout a city region and across borders, irrespective of the public transport service providers used and the government entity to which they are contracted. An assessment of existing public transport plans, and specifically the "inward looking nature" of most of the public transport planning done at a metropolitan level, shows that insufficient attention is being given to network continuity and the planning of services across municipal borders. This is to some extent negated by the existing of the commuter rail corridors and the subsidised commuter bus services, addressing the demand along pre-1994 high-density passenger demand corridors, associated with apartheid settlement strategies. Gaps exist in formal public transport network planning, in terms of the continuity of lower order network links serving the transport demand in new developmental areas and less dense passenger demand corridors. Due to the lack of formal planning in this respect, public transport networks are evolving informally through operations planning done by mainly mini-bus taxi operators.

9.15.3 Integration at Transit Nodes

Major opportunities are emerging, where significant improvements in public transport nodes, interchanges and facilities offer the potential to attract development and stimulate higher density development. Through effective integrated planning at public transport interchanges and precincts the following can be achieved:

- Integration with other public transport modes is maximised,
- The reshaping and regenerating of the urban form in urban areas such as inner cities,
- Promotion of a more compact urban form and densification through integrating transport and land use planning,

- Promotion of local economic development especially in previously disadvantaged areas, and
- Increasing the development value of properties in and around transport facilities.

With the exception of for example the Gautrain stations (and specifically the Transit Orientated Development at its Sandton Station), planning of public transport networks in silo's has resulted in less than optimal integration. The opportunities listed above are not fully exploited. Where current facilities could in many instances be termed "sinkholes" as they may devalue investments, such nodes have the potential to become "ant heaps" being attractive to investors because of the potential value-add on offer.

Integration with the private car is often also not pursued optimally during planning through the provision of adequate and attractive park-&-ride facilities.

The planning of public transport nodes in many instances do not extend much across the property boundaries on which such facilities are developed. This makes for the lack of non-motorised transport facilities or at best unsafe, unsecure pedestrian and cycling environments.

9.15.4 Planning Information

Reliable and up to date information on travel patterns and trends, user preferences and actual passenger volumes (i.e. satisfied demand) is essential as a basis for effective public transport planning at strategic, tactical and operational levels, such as;

- the calibration of demand forecasting models, to be used for the testing of network development options;
- decisions on appropriateness of modes,
- operations and business planning of services,
- designs of service provision agreements, and
- scheduling and optimisation of services.

Most of the existing data is either dated (i.e. household census information is only as recent as 2002) or the reliability thereof is in question. With specific reference to the Current Public Transport Records information, which formed a basis for all the ITPs, budget constraints limited the scope and extent of the collection.

9.15.5 Modal Planning

(a) IRPTNs

Integrated Rapid Public Transport Networks (IRPTNs) of metropolitan municipalities are in various, whereby;

- City of Joburg has successfully implemented Phase 1A of its Rea Vaya BRT system and being busy planning Phase 1B,
- City of Tshwane has completed the operations planning for two trunk lines and a number of complementary lines in June 2012, and
- Ekurhuleni Metropolitan Municipality had completed a modal integration strategy in 2008 and building onto this a BRT scoping study was completed in 2012.

Both the District Municipalities of West Rand and Sedibeng had commenced with some high-level planning of primary strategic public transport networks with some elements of IRPTNs, but this has not gone much further than identifying a number of key corridors in the respective areas.

(b) Commuter Bus

Subsidised commuter bus services are managed by the GDRT in terms of kilometer- based contracts, which have all long expired and have been extended on a month-to-month basis since. The letting of new contracts have been delayed for many years, largely as a result of disagreements between organized labour and government on certain terms for contracting services.

The services operated in terms of the subsidised bus contracts still reflect the pe-1994 state to a large extent. In order to align the next generation of contracts to be let with the evolving public transport system and related requirements in Gauteng, the service will require significant restructuring and redesign.

In anticipation of and in preparation for the design of new contracts the Gauteng SPTN was developed in 2004. This was further refined by the development of the Gauteng IPTN in 2009. The IPTN focussed on the following areas:

- City of Tshwane Metropolitan,
- West Rand District Municipality,
- City of Johannesburg Metropolitan Municipality, and
- Sedibeng District Municipality.

The IPTN should be viewed in the context of the Gauteng SPTN and followed the same principles as guided by the SPTN:

- Road-based public transport corridors should be located on arterials and main roads rather than freeways, with generators/attractors on both sides and ends of the route. This is to try to maximize the number of people who can access the SPTN by walking, as well as the potential for passenger turnover along the route.
- The SPTN should be kept as direct as possible to minimize travel times and maximize the potential for road-based public transport priority measures such as dedicated bus ways, public transport lanes, priority traffic signals, and so on.
- The SPTN should have integrated public transport facilities at all nodes to allow for transfers between modes.
- Public transport services should be provided by the appropriate mode for the demand
- A system of feeder and distribution routes serving the SPTN trunk routes to ensure maximum geographic and network coverage.
- Frequent and rapid peak and off-peak services between major origins and destinations on the SPTN provided by the appropriate mode for the corridor demand.
- Sufficient vehicle capacity to prevent overloading and long queues.

Currently the IPTN is being reviewed and expanded to cover the areas of Metsweding and Merafong.

From an assessment of the original IPTN of 2009 and the scope of the review and extension thereof currently being undertaken, it can be concluded this work will provide a fair basis for the design of new contracts for the provision of commuter bus services. However, more work may have to be done before contracts can be designed, which may *inter alia* include data collection on current passenger volumes, research to be done on fare structures, and costing and affordability to government of route network options in relation to available subsidy budgets.

(c) Municipal Bus

Municipal bus services in the CoT, CoJ and EMM municipal areas are planned by the respective municipal operators. With the exception of limited operational planning for the purpose of optimising services by making smaller route and timetable adjustments, very little other significant planning has happened in the past few years.

Major planning initiatives are not taking place, despite the fact that major restructuring of these services is required, to better meet the public transport needs of the evolving and developing cities. Where route networks often still support city forms of the 1970's, with largely radial networks focussed on strong city central business districts, many decentralised business and commercial nodes has developed since, as well as new areas added into metropolitan municipal boundaries, which are not well served. Municipal bus operations provide largely suburban type services and in most instances also only serve commuters and scholars in former "white" suburbs.

The lack of major restructuring may to some extent be "stalled" in anticipation the planning of IRPTNs and the relationship between the municipal bus operations and the evolving BRT systems.

(d) Learner Transport - Bus

Dedicated learner transport services are managed by the Gauteng Department of Education. However, talks are on-going regarding the transfer of the Learner Transport Function to the GDRT.

Dedicated learner transport routes and services are generally being planned by contracted learner transport bus operators in cooperation with school principals and school parent bodies. This is being done in isolation of any other public transport services and is limited to operational planning.

(e) Mini-bus Taxi

Mini-bus taxi routes are generally planned by taxis associations and its members (i.e. taxi operators), as to maximise their market share and often in competition with other modes of public transport. Although taxi routes are reflected in municipal Current Public Transport Records (CPTRs), the municipal planning authorities have had very little input into the

planning of these unscheduled services, with the exception of providing ranking and holding space, as well as en-route stops.

Taxi associations, their members, vehicles and routes are registered with Provincial Taxi Registrar and operations are regulated in terms of Operating Licences, issued by the Provincial Operating Licence Board (replaced by the Provincial Regulatory Entity).

9.16 Road Based Public Transport Status Quo Analysis

9.16.1 IRPTN

The only metropolitan municipality in Gauteng that has been successful in implementing their IRPTN planning is the City of Johannesburg. Phase 1A of their Rea Vaya BRT system has been in operation since 2010 and most of the infrastructure, facilities and stations for Phase 1B have been completed.

General passenger acceptance of the system has been fairly good and the patronage is growing. The general quality of the service and facilities is perceived to be of a good standard. However, the fare income is much lower than projected, which means the system has and will in the foreseeable future have a significant reliance on additional operational funding support (i.e. subsidy). This may to some extent be attributed to the Rea Vaya fare policy and the fact that the fares charged per kilometre are significantly lower than other public transport service in Gauteng being operated over similar distances. As a consequence, this will place some strain on the City's ability to further operationalize and expand their system. If a large portion of this operational financial support is to be sourced from a national level, this may also impact on the restructuring and development of public transport elsewhere in the Province.

The question begs as to whether the almost exclusive focus on BRT as the mechanism for restructuring municipal road-based public transport should not be reassessed, given the high BRT development, transitional and (now apparent) operational costs. A more balanced approach with a wider modal focus, to possibly include express bus, dedicated public transport lanes, etc., may be more appropriate, efficient and a cost effective way to develop an integrated public transport network.

9.16.2 Commuter Bus

Subsidised commuter bus services are managed by the GDRT in terms of kilometer- based contracts, which have all long expired and have for a number of years been extended on a month-to-month basis. All contracts have been extended and will again expire in September 2012. The letting of new contracts have been delayed for many years, largely as a result of disagreements between organized labour and government on certain contracting terms. These short-term contracting arrangements have created instability in the bus industry and have discouraged operators to invest in fleet and infrastructure. It is anticipated that a directive will come from national DoT for further extension of 3-year extensions.
The services operated in terms of the current subsidized commuter contracts still largely reflect the pe-1994 state, with very little integration with other public transport services. In order to align the next generation of contracts to be let with the evolving public transport system in Gauteng, the services will require significant restructuring and redesign. Many of the services are not aligned with either the local or provincial IPTN designs. Duplications of services also exit with the BRT lines, which are already in operation.

The general quality of services provided in terms of the contract is reasonably acceptable and in many areas operators cannot “stay ahead” in providing enough service capacity to meet demand.

However, to promote integration and remove some of the inefficiencies and duplication form the public transport network of services in Gauteng, the restructuring, design and letting of new contracts should be done as soon as possible.

9.16.3 Municipal Bus

Municipal bus services in the CoT, CoJ and EMM municipal areas are operated by the respective municipal operators. With the exception of limited operational planning for the purpose of optimising services by making smaller route and timetable adjustments, very little other significant service restructuring has taken place over the past numbers of years.

Route networks often still support city forms of the 1970’s; with services being operated on largely radial networks focussed on strong city central business districts. Many decentralised business and commercial nodes has developed since, as well as new areas added into metropolitan municipal boundaries, which are not well served by these operators, whereas patronage has declined on their traditional routes.

The municipal bus operators provide largely suburban type services and in most instances also only serve commuters from former “white” suburbs. Large components of almost all these services offerings comprise of dedicated scholar services from within city suburbs to former Model C schools.

These services generally face sustainability and labour challenges (possible with the exception of the municipal operators in the Ekurhuleni area), as well as aging fleets, which largely impacts on the ability to provide reliable services of a good quality.

The City of Joburg had in 2011 completed an investigation into the organisational restructuring of its municipal operator, which may path the way to a more sustainable future for Joburg Metrobus.

However, major operational restructuring of these operators and their services has to some extent been “stalling”, in anticipation of the further development of IRPTNs and this providing clarity about the relationship between municipal bus operations and the evolving BRT systems. However, the general restructuring of public transport in the respective municipal areas and the development of IPTNs may over time offer new opportunities for these operators, possible in a “new organisational form”.

9.16.4 Learner Transport Services

Dedicated learner transport services, managed by the Gauteng Department of Education, are fulfilling a vital role in transporting learners in more peri-urban areas to schools. These are learners that do not have schools within a 4km walking-distance from their homes.

However, due to the “weak” contracting dispensation, which largely stems from the fact that transport and the management thereof is not closely related to the core functions and experience of the Gauteng Department of Education, these services are not very efficient. These services are largely being managed by GDE regional offices and school principals. The services are managed and monitored at a very high and “course” level, if at all. This in many instances results in poor service levels, with scholars often arriving late at school or not at all.

This situation is further aggravated by the fact that these services are 100% subsidised (i.e. free to the users) and that the rates being paid to contracted operators are unsustainably low. This leads to unacceptable vehicle ages and bad conditions thereof, as well as overloading at times. This is generally an undesirable situation from a road-safety perspective.

The urgent restructuring of these services and the contracting dispensation link to these types of services need to be considered. A more desirable dispensation will most probably be, where the transfer the function and the funding is transferred to the GDRT as soon as possible.

9.16.5 Taxi Services

Minibus-taxis are the dominant provider of public transport services in Gauteng and over a million passengers are transported daily by taxis to work or school. This is almost double the passengers who use rail and bus services daily. There are approximately 35,000 short-distance taxis operating within Gauteng. Approximately 25,000 or 70% of these taxis are estimated to operate within either Ekurhuleni of the City of Johannesburg.

Minibus taxis are operated by owner drivers, or by owners who employ drivers and have organised themselves into associations, which are in many instances locality based. (for example, the Mamelodi Amalgamated Taxi Association will operate from Mamelodi, and the Alexandra Taxi Association from Alexandra).

The industry offers a unique, unscheduled service which often responds to the needs of the commuters. It offers a door to door service and if required can within reason deviate from its route to serve the commuter. Although authorities attempt to provide formal lay-byes along a route for the taxi to stop and drop-off or load passengers, this is often ignored. Due to the informal nature of the industry, it is in a much better position to respond to new routes and is often the first public transport mode to serve an area.

The industry competes in many instances directly with the rail and/or subsidised commuter bus contract services. The fares are comparable to the subsidised commuter bus contracts that is subsidised. It currently still sees its role as providing a line-haul service and most attempts in the past to re-align its services to provide feeder/distribution services to for example the rail industry has failed.

The taxi industry only offers cash fares, which is usually determined over the full distance of the route. Passengers being dropped off along the route pay the full fare.

In terms of the National Land Transport Act, any operator wishing to convey passengers for a financial reward need to apply for an operating license. Local municipalities are supposed to prepare Integrated Transport Plans that identify all the public transport routes in its area of jurisdiction. The plan should also indicate the number of operating licenses required on each route.

The process of converting radius based permits to route based permits and then route based permits to operating licenses has impacted on the industry. The slow pace of progress, coupled with problems experienced at the Operating License Board is a concern to the industry. In addition the industry is being targeted by law enforcement agencies to produce legal, valid operating licenses when stopped on routes.

In an attempt to formalise the industry and to include it in the subsidy regime, the industry is seen as a substantial role player in the implementation and roll-out of the IRPTN's in the various authorities. Affected operators is provided the opportunity to become a shareholder in the new vehicle operating company or are being compensated for loss of business and in some cases individuals will leave the industry. The industry is not trusting of the motives of Government regarding BRT's and in an attempt to earn their trust the government is assisting the industry during the planning phase of the BRT, by providing technical assistance to the industry to assist with understanding the impact of the operational plan, the business and financial planning as well as negotiations with government.

The Taxi Recapitalisation Program is another initiative by Government to improve the quality of vehicles and service offering of the industry. According to the taxi scrapping administrator 11 100 taxis have been scrapped in Gauteng since inception of the program.

The quality of the service as perceived by the commuters is not good. In surveys, passengers indicated that that the most pertinent problems are that taxis are dangerous, either because of violence, accidents, or crime at facilities; fares are seen as high; and overall service quality is experienced as unsatisfactory

In moving forward, it is essential that the minibus taxi industry is encouraged and assisted to complete the transition to the formal sector.

9.17 Analysis of Public Transportation

9.17.1 Management of the Public Transport Function

The Management of the public transport function across the Gauteng City Region is often inefficient and incoherent, mainly due to the following reasons;

- Loss of institutional memory,
- Uncoordinated institutional structures,
- Uncoordinated and separate modal focus,
- Uncoordinated and ”inward-looking” municipal focus, and
- Lack of seamless institutional and organisational arrangements.

Political processes resulted in frequent change in decision-makers. This is further aggravated by a high turn-over in senior technical officials in all spheres of Government, causing a loss in institutional memory. This has led to interruptions in planning and implementation of public transport networks and services, and in turn also resulted in work often being redone and revised unnecessarily. This hampers progress. The public transport environment needs more stability in the management of its systems.

The institutional arrangements for public transport are to some extent set out on a high level in the NLTA, 2009. However, it is debatable whether and to what extent these arrangements are fully appropriate to the Gauteng City Region, which spans various Metropolitan and District municipalities. It is clear from the status quo that gaps exist in the coordination and management of public transport. Some refinement is required to these statutory arrangements, to ensure more effective coordination and management.

Management of public transport is often done in modal silo’s, whereby Integrated Rapid Public Transport Networks (BRTs) and municipal bus services are managed by metropolitan authorities, subsidised commuter bus services by the GDRT and subsidised scholar transport by the Gauteng Department of Education. This uncoordinated and separate modal focus results in the sub-optimal deployment of resources with often the unintended consequence of duplication, as well as inter-modal and destructive competition.

In addition, the uncoordinated and “inward-looking” approach of the various spheres of government, means that municipalities primarily focus on intra-municipality travel needs, with fairly little attention being given to inter-municipality services and public transport network continuity across the Province.

From the above it is apparent that the lack of seamless institutional and organisational arrangements, which is required for the efficient management of transport in the City Region, can only be addressed through the establishment of new/additional institutional arrangements. The most effective manner to deal with this may be the establishment of a new entity, which should be tasked with the responsibility of coordination and management of public transport.

In general the public transport system characteristics largely the transport arrangements of 30+ years ago, aligned to the pre-1994 political dispensation. Operations are fragmented and operators focus on maximising market share.

9.17.2 Sustainability and Affordability to Government

The sustainability and longer term affordability of the road-based public transport network is under pressure. This is emphasised by:

- Underinvestment in public transport infrastructure,
- Aging and condition of rolling-stock,
- Overloading,
- Delays,
- Levels of passenger safety, and
- A general deterioration of the public transport system.

This can be attributed to a number of factors, which *inter alia* include:

- Disaggregated funding streams,
- Ineffective regulation and en-route/corridor completion,

A disaggregated funding dispensation consisting of various sources is used to provide operational support and subsidy to public transport; namely:

- Public Transport Operations Grant,
- Public Transport Infrastructure and Systems Fund, and
- Municipal budgets.

The provisions of the Division of Revenue Act (DORA) provides for the Public Transport Operations Grant (PTOG) from Treasury, to fund subsidies for regional commuter bus services. The subsidies paid to private bus companies for the provision of these bus services are managed by the GDRT.

The City of Joburg pays the respective Rea Vaya operating companies, contracted to provide the bus rapid transport services, monthly operating fees. Although the original expectation was created that the Rea Vaya operational costs will largely be covered by the fare income, this has not been the recent experience. These fees are funded from a combination of sources, namely the municipal budget and the Public Transport Infrastructure and Systems (PTIS) fund. The latter was established by National Government as a grant to assist mainly with the development of public transport infrastructure and systems. The question may be asked whether this will be available as a source of operational funding support in the medium- to longer-term.

The funding of operational support to municipal bus operators is done from the budgets of the respective municipalities. Dedicated scholar transport services are subsidised by the Gauteng Province, through the GDE and the funding thereof is done through the provincial budgeting and MTEF processes, whereas the mini-bus taxi industry does not have any access to operational funding support from government.

The disaggregated funding dispensation described in the paragraphs above does not enhance integration, the sustainability of public transport systems and the affordability thereof to Government.

9.17.3 Affordability, Fares and Ticketing

The affordability of public transport remains a challenge to many travellers, specifically commuters and work-seekers in the previously disadvantaged areas. In many instances passengers cannot afford the full costs of the public transport service (the economic fare). In order for them to be mobile and be able to such services, subsidies are made available by government to make the fares more affordable.

The percentage of the economic fare that is subsidised differs vastly across the various service offerings across Gauteng. It ranges from 100% for learners using dedicated, contracted transport services, to above 50% for passengers using subsidised commuter bus services and 0% for mini-bus taxi users. The fares and subsidy rates for subsidised commuter bus services are based on a determination made in the late 1980's which is escalated annually by inflation. Certain subsidised operators offer concessionary fares to

certain categories of passengers (i.e. pensioners, learners, children etc.), which have a higher level of subsidisation than ordinary commuter services. It is important to note that mini-bus taxis are transporting in the order of 70% of commuters in Gauteng, meaning that the affordability of their transport is controlled by operators, without any government support. This has to be seen in the context of the fact that in many areas and on many routes, mini-bus taxi services are available as the only mode of public transport.

Where public transport services are subsidised, various subsidy allocation mechanisms are used. Current subsidy allocation mechanisms are structured in such a way that it virtually benefits only commuters. To promote public transport integration, a better alignment in subsidy allocation mechanisms across modes and services is required. It is therefore essential that a provincial-wide strategy for financial support to public transport be developed. Such a strategy should ideally also deal with the appropriate mechanisms for targeting specific categories of passengers, in order to enhance their affordability levels.
A comprehensive fare policy is critical to properly guide the setting of fares in the province. Such policies have to provide for a balance between affordability of transport to users, affordability of service offerings for Government, as well as longer-term sustainability (profitability for operators). Various operators follow different approaches towards fare setting and apply their own policies, depending on their mandate. The simplest approach is often followed by the taxi industry, where operators on routes where they compete with subsidised commuter bus services, “peg” their fare just below the bus cash fare. This is not a sustainable approach, as they are a non-subsidised mode, trying to compete with a subsidised mode.

Public transport fares in Gauteng differ significantly across various services and modes, if the passenger rate per kilometre are calculated and compared between different services and modes. In pursuit of integrated fares, a more unified fare policy will have to be developed, which must consider the nuances of all the different fares on the modes.

The type of ticketing used in public transport varies from paper tickets to smart cards, with most operators still accepting cash. The introduction of integrated ticketing, by means of an interoperable smartcard accepted for fare payment by most public transport operators, will go a long way to enhance passenger convenience.

9.17.4 Service Quality

The service quality of road-based public transport in general is not attractive to the car user and most travellers previously captive to any of these modes opted to use private cars the moment it becomes affordable to them. The general unattractiveness of road-based public transport services *inter alia* stems from;

- Service availability (is the bus going to come and not breakdown along the route?),
- Service reliability (is the bus going to depart and arrive on time),
- Service frequency and intervals, especially outside the peak periods,
- Service operating periods (often only during peak periods with virtually no service during off-peak periods)
- Availability of seats and having to stand significant part of the journey,
- Crowding on-board of vehicles,
- Quality and age of vehicles, as well as quality of the “ride”,
- Accessibility for the mobility impaired (not just persons in wheelchairs, but also the elderly and person with other disabilities,
- Personal security, and
- Traffic safety considerations.

Generally, passenger satisfaction levels with respect to service quality are significantly higher, where contracts between authorities and operators exist for the provision of public transport services that include a “service performance regime”. These are where certain service quality aspects had been specified, are monitored and where operators are penalised for not achieving the service performance standards. Where such dispensations had been introduced, the experience in most instances and areas were a modal shift, often from one public transport mode to another.

9.17.5 Availability of Passenger Information

A major down-side of the current road-based public transport in Gauteng is in many instances the lack of, the quality of and/or the disaggregated nature of service information to the public at large (the Rea Vaya system is largely an exception in this regard). This often includes very basic information on *inter alia*;

- Routes,
- Timetables, and
- Fares.

Were such information is available it is mostly mode or service specific and managed by the various operators internally. A key component or pillar of public transport integration is integrated information. This implies providing passengers with an integrated "one-stop" solution, whereby passenger information on various modes and services can be provided through one "centralised" mechanism or facility. This could take the form of a "call centre" or access to integrated data-bases, which could be made available on personal electronic devises, such as the cell-phone.

A key component is also the concept of "customer care", whereby passengers can call a number for real-time service information or log complaints.

9.17.6 Facilities and Amenities

The lack of public transport facilities is a severe inadequacy on many parts of the road-based public transport network, especially in the previously disadvantaged areas (again the Rea Vaya system is an exception in this regard). This includes a range of facilities, such as;

- Termini,
- Ranks,
- Holding areas,
- Stops.

Were facilities exist, many passenger amenities at larger nodes are lacking (i.e. toilets, shelters, etc.) or these amenities are not well maintained. This further leads to the unattractiveness of road-based public transport services in general, but specifically to travellers who have access to private cars. They find these facilities inconvenient and unsafe.

In most cases adequate, convenient and safe non-motorised access to public transport services are also lacking ("*the last mile*"), which aggravates the convenience, personal safety and security.

9.17.7 Basis for Contracting Operators

A range of contracting arrangements for the provision of the various public transport services and the basis for providing operational support (i.e. subsidy allocation mechanisms) are found in Gauteng.

The privately owned operating companies providing the Rea Vaya BRT services are contracted by the City of Joburg on a “gross cost” basis. This means that fare revenue is collected by the City (or a separate agency appointed to do so on its behalf). The City uses this revenue, topped up by additional funds, to pay the operating companies for their services, on a rate per kilometre basis. The operating companies do not deal with fares and revenue management and do not take any risks related to patronage or fare revenue income.

In addition, privately owned bus operating companies, providing regional commuter bus services, are contracted by the GDRT on a “net cost” basis. Tickets are sold and fare revenue is collected, retained and managed by the respective operators themselves. The operating subsidies paid by the GDRT tops up the difference between the operating cost (i.e. economic fare) and the revenue from ticket sales. This payment mechanism is also based on output and passenger (“live”) kilometres. In this instance the operating companies do carry most of the patronage and fare revenue risks.

Because municipal bus services are generally operated by departments within municipalities, no contracts exist between these operators and the respective municipalities. In the case of some of the operators that have been corporatized, service level agreements may be in place. The subsidisation of these services is done on a deficit subsidy basis, whereby the difference between the annual operating costs and the fare box revenue is “made good” annually from the City budget.

Operators providing dedicated learner transport services are at present being contracted to provide such services by the GDE. The basis for payment for contracted dedicated scholar transport services is a rate per learner-kilometre. Again, in line with the final draft National Learner Transport Policy, 2009, a new basis for payment is being considered, which will most probably be on a rate per vehicle-kilometre. The level of subsidisation is 100%, as these services are being provided free of charge to the learners.

For the effective integration and management of road-based public transport services across the Gauteng City region, a strategy for arriving at a more common or shared basis for contracting public transport operators needs to be developed. The restructuring and rationalisation of the current public transport operations with the IPTN (including road and rail modes) is critical for an integrated system.

10 RAIL NETWORK AND SERVICES PLAN

10.1 Background

PRASA Rail is responsible for the substantial part of passenger rail transport services in Gauteng, which includes the Metrorail commuter rail services, as well as the inter-city passenger rail Shosholoza-Meyl services. A comprehensive railway network exists in Gauteng. Most of the older industrial areas, city CBDs, and low-income residential areas are well served by this railway network that has been developed over many decades.

The commuter rail network in Gauteng is supplemented by the modern Gautrain rapid rail services in the high-density corridor between Johannesburg and Tshwane, and between Sandton and OR Tambo International Airport (ORTIA).

In most metropolitan areas in South Africa rail transport plays an important role in providing mobility to especially low income people for their daily transport needs. While the market share of rail is unacceptably low in Gauteng, the existing rail passenger network does cover the province extensively in connecting most of the major activity/economic nodes with many of the low-income settlements and industrial areas, despite the fact that past spatial and transport infrastructure was planned and designed in terms of distorted apartheid land use policies.

The existence of remote settlements (dormitory suburbs) far away from the city centres, required rail transport to provide labour accessibility to the main areas of employment. There is significant potential to densify and develop Transit Oriented Developments (TOD) along the existing rail network as the rail system currently runs through large pockets of undeveloped land.

It is further acknowledged that the rail system and service performance requires a major transformation to ensure that it truly performs as the backbone of the public transport system in Gauteng within a fully functional integrated public transport system approach.

It will also need not to be isolated from an integrated multi-modal system, where various modes serve to feed to and distribute from the other services.

10.1.1 Hierarchy of Modes

Much has been written internationally on the requirement to select the most appropriate mode for any corridor. It is clear that it makes economic sense to select the most appropriate mode when Government intervention in the transport market is done, in order to ensure good value for money. It is clearly also wasteful to subsidise parallel services providing the same or similar services when both are not fully utilised.

Rail transport is not the best mode for all corridors, as it requires high volumes to make it feasible. There are a number of corridors (such as Nigel – Springs) where it would not have made sense to develop a new railway system, and the only reason why certain rail services are still operational is because of historic reasons.

Many attempts have been made to categorise the role of modes and to determine the most appropriate mode. The most recent and relevant for Gauteng is the work of the GTMA who proposed the model in 2009, as indicated in **Figure 10.1**.

These figures have to be used with circumspection, as externalities such as the fuel price, Rand exchange rate; passenger behaviour, etc. play a major role. The fare levels, peak intensities and way to interpret the passenger numbers also need to be addressed carefully.

Notwithstanding, it does provide an indication that there are different forms of rail transport (mono rail, light rail transit, metropolitan rail, regional rail and high speed rail) and that rail-based solutions have more of a mass transport characteristic than the road-based solutions.

10.2 State of Rail Planning in Gauteng

A comprehensive investigation has been done to obtain information on the state of planning of transport in Gauteng and all modes of transport. **Table 10.1** gives an overview of the documents that have been obtained and assessed at a broad multi-modal level.

Historically, a substantial amount of planning has been done for the Gauteng region by the former SARCC and PRASA / PRASA Rail, as well as by the Gauteng Province and Municipal Planning Authorities.

The most prominent and relevant of these studies arguably are the Vectura Public Transport Study undertaken in the early 1990's in preparation of transforming the Roads Branch into the Gauteng Department of Public Transport Roads and Works, (now the Gauteng Department of Roads and Transport), and the Gauteng Rail Status Quo and Plan undertaken under the auspices of the Gauteng Rail Planning Coordination Committee (GRP) in the late 1990's.

The declaration of ***"Rail as the Backbone of the Public Transport System"*** as recorded for the Gauteng City Region Public Transport Conference held on 28 May 2012 is generally supported by most transport plans. This is mainly due to the mass transport characteristics of rail transport.

The most prominent or relevant transport plans done recently, is the PRASA Rail Master Plan which is currently being considered for approval. At a much lower scale of detail, but also important, are the Gautrain investigations into capacity improvements and linkages with un-served areas.

Table 10.1 – List of Rail Studies for Gauteng

	Plan Title	Completion Date	Approval Status
1.	*National Passenger Rail Transport Plan (Phase 1 and Phase 2)*	*2006*	*Completed*
2.	GTMA – Rail Agenda for Gauteng	2009	Completed
3.	***PRASA Rail Master Plan***	*2012*	*Final Stages*
4.	PRASA Strategic Plan	2012	Draft
5.	**Gautrain Nodal Development Analysis**	2012	Draft
6.	**Gautrain Expansions and Extensions**	2012	Underway
7.	Gauteng Transport Conference in May 2012	2012	Completed
8.	Gauteng Transport Budget Speech by the MEC	2012	Completed
9.	NPC National Development Plan 2030	2011	Completed and presented to Cabinet
10.	National Transport Master Plan	2010	Draft
11.	Gauteng PLTF	2010	Completed
12.	Spatial Development Framework (Provincial, Metropolitan, and District Municipalities)	2010/2011	Completed
13.	Integrated Development Plans (Metropolitan and District Municipalities)	2009, 2010, 2011	Completed
14.	Integrated Transport Plans (Metropolitan and District Municipalities)	2009, 2010, 2011	Completed

	Plan Title	Completion Date	Approval Status
15.	PRASA Tshwane Regional Rail Plan	2006	Approved by Cabinet
16.	PRASA Regional Plan Southern Gauteng	2006	Approved by Cabinet

10.2.1 Institutional Arrangements and Alignment Plans

The Gauteng Rail Planning Coordination Committee (GRP) was established and operated during the 1990's to coordinate the planning of the Gauteng Provincial Department.

More recently, a Gauteng Provincial Rail Steering Committee was established as per the Memorandum of Agreement signed between the Province, Gautrain, PRASA and the respective planning authorities. These cooperative arrangements also resulted in joint project development between the Province, Municipalities and PRASA towards intermodal transport facilities.

PRASA welcomed the provincial initiative to create specific strategic planning and operational co-ordination forums with Gautrain to ensure alignment of future plans towards improved integration.

PRASA has maintained Rail Co-ordination and Liaison structures with all the transport planning authorities in Gauteng over the past 15 years.

The above planning and co-ordination structures have proven very valuable in aligning PRASA's plans with ITP's, IDP's and IRPTN's. PRASA is of the view that these structures will be able to serve as solid foundation to integrate rail planning into a future envisaged Transport Authority for the Gauteng Province.

10.2.2 Gauteng Transport Management Authority (GTMA)

The erstwhile GTMA which was subsequently dissolved prepared the report "*International best practices for rail, audit and analysis of Provincial/Rail & National/Municipal planning and strategies*". This report identified seven potential rail investment projects as indicated in **Figure 10.1**. It must be noted that the latest more-recent BRT planning was not incorporated in the identification of these additional potential rail corridors:

- New Rail Link: Akasiaboom - Sandputs and Soutpan Road - M80, need to utilize appropriate modes, road public transport is overburdened due to rails inefficiency - link will reduce travel times significantly as a result of direct link to Pretoria CBD. Priority 2A
- New light rail link alongside motorways, M1/De Villiers Graaf Motorway, Golden Highway. Priority 2B
- New rail line - Vosloorus Triangle. Priority 2C
- New rail link: Orange Farm (linking onto the existing Vereeniging - Park rail lines, north of Sebokeng - though Evaton - linking north of Orange Farm), to facilitate intermodal interchanges - Priority project 2D
- New Rail Link: Isando - Tembisa
- New Rail Link: Orlando West - Soweto Highway - Johannesburg
- New Rail Link: Daveyton - Etwatwa - Van Rhyn

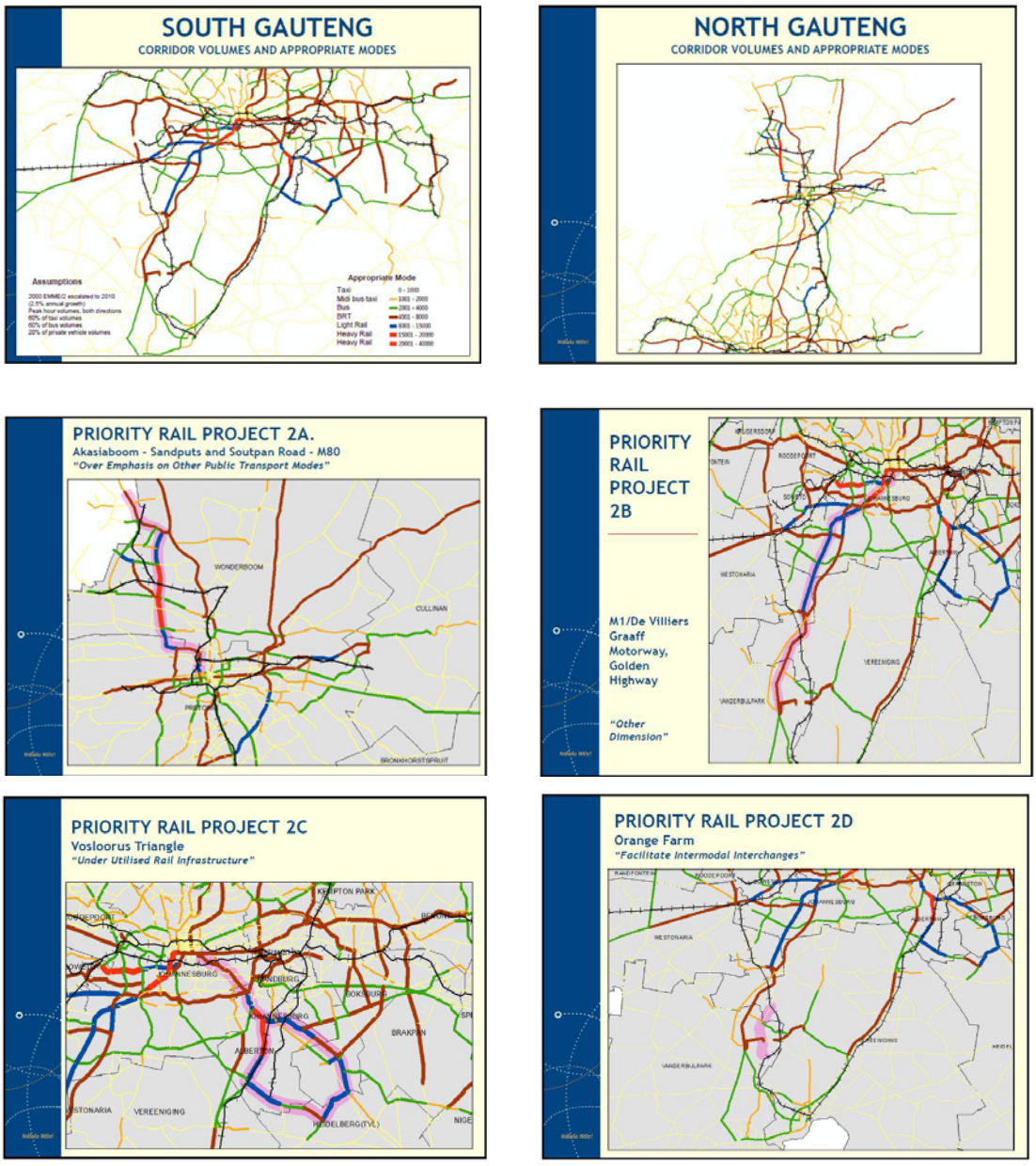
10.2.3 PRASA Long Distance Passenger Transport

The National Transport Master Plan (NATMAP) investigation by the Department of Transport focused largely on national priorities and identified a need to investigate significantly in rail transport. Much attention was given to freight logistics. The most public of the proposals pertaining to passenger rail transport was the High Speed Rail Links between:

- Johannesburg and Durban,
- Johannesburg and Cape Town, and
- Johannesburg and Beit Bridge (on the Zimbabwe border)

It should be noted that the draft NATMAP document has not yet been approved.

Figure 10.1 - GTMA Rail Priority Projects



10.2.4 PRASA Planning Objectives

The Strategic Planning Objectives of PRASA in terms of the PRASA Rail Master Plan are the following:

- Support **economic growth** and development in Gauteng
- Strengthen Gauteng's role as a hub - transport system to support **high density development**
- Connecting economic and or growth nodes
- Provide transport which supports social activities to **improve the quality of life**

- Improve **accessibility and connectivity** to marginalised communities
- Develop public transport to promote **tourism** activities
- Enhance **personal safety and security** for passengers
- Promote **effective integration** between land use and transport
- Minimise the adverse impact of transport on the **environment**
- Improve **strategic connectivity** to other Provinces/other parts of Southern Africa
- Develop a modern, **integrated**, high **quality, accessible**, efficient, affordable, customer responsive **public transport system**
- Improve the **resiliency and reliability** of the public transport network

10.2.5 Approach and Key Aspects of the Planning

PRASA has done extensive strategy development and planning during the past few years. Most of this work has been included in the PRASA Rail Master Plan. This document contains a volume dealing with Gauteng.

PRASA's technology assessments clearly indicate that the obsolete state of the current Metrorail technology, and the inability to enhance rail to its rightful role, will result in rail becoming an expensive sunken investment and insignificant capacity carrier compared to international standards, while occupying the position as high capacity mass mover from a policy expectation.

In moving forward, it will be critical that the rail transformation/modernization process is not only achieved, but accelerated, to ensure improved service delivery, and to facilitate the planned growth and development of Gauteng over the next 30-40 years as proposed by the GSDF and Provincial Growth Strategy.

The transportation strategy for the rail commuter system in Gauteng builds on the DOT and PRASA's strategy for stabilization, rationalization, modernization and integration of rail commuter services with the Integrated Rapid Public Transport Networks of the Metro's and broader provincial spatial framework.

The Rail Strategy and Plan for Gauteng Province that is currently being finalised will focus on short, medium and long term interventions which are aligned with the spatial, land-use and economic development/transformation framework of the Province, as well as with the IDP's and ITP's of the respective transport planning authorities.

The document is very comprehensive and contains a large amount of planning proposals, most of which are aimed at dealing with the investment backlog in rail transport that built up over the past three decades. The following are some of the key planning proposals in this document in Gauteng.

a) Planned Modernisation Projects in Gauteng

An amount of R10 billion has been budgeted in the MTEF to modernise rail transport in Gauteng. The most prominent of these are:

- R3 billion for the upgrade and maintenance of existing rolling stock in Gauteng
- R4 billion for the re-signalling of the system and the implementation of centralised modern signalling control
- R4 billion for track, platform, station and electrical infrastructure rehabilitation as part of the corridor modernisation project for the Mabopane – Johannesburg – Naledi corridor.
- R900 million for the national speed gate and station management program, including CCTV, electronic display boards, alarms and new public address systems at 40 stations in Gauteng.
- R250 million for the station upgrades and station improvements of Mabopane and seven additional stations.
- Station modal integration projects in conjunction with Province and the local authorities at Stretford, Leralla, Vereeniging, Germiston and Roodepoort.
- Universal access pilot projects at 5 stations
- Corridor public works job creation program, for the cleaning, fencing and walling of stations on these corridors.

b) Planned Extensions

Figure 10.2 indicates the most prominent of the railway network extensions that are being proposed in Gauteng North. **Figure 10.3** indicates the main rail service network extensions being proposed in Gauteng South.

Figure 10.2 – Proposed Rail Extensions in Gauteng North

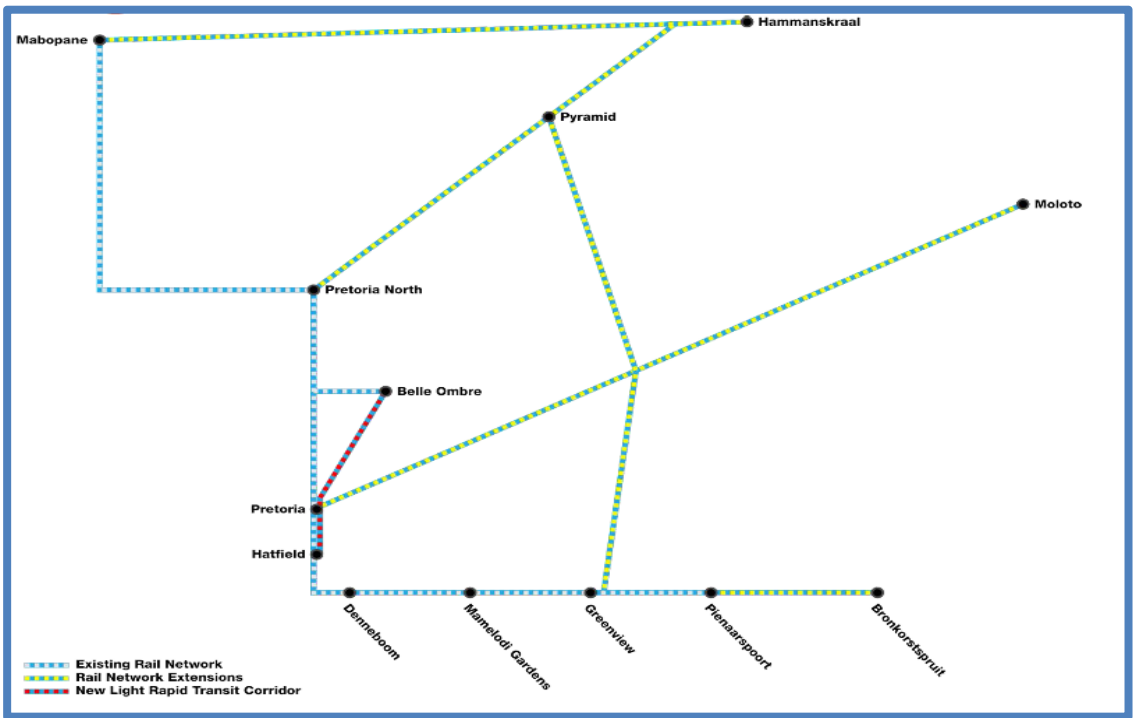
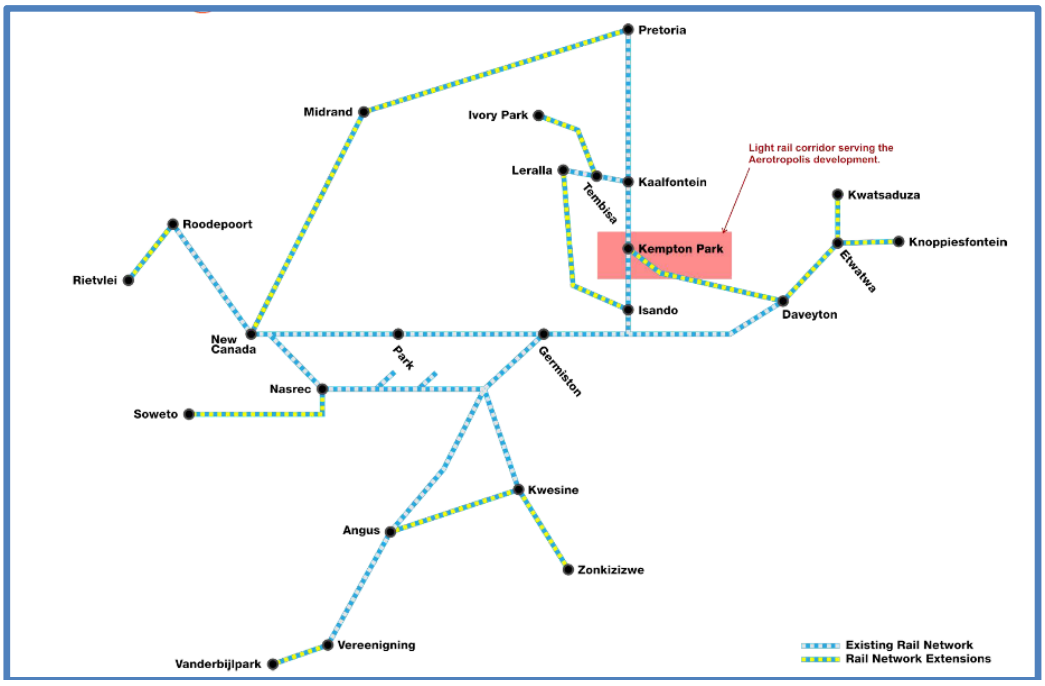
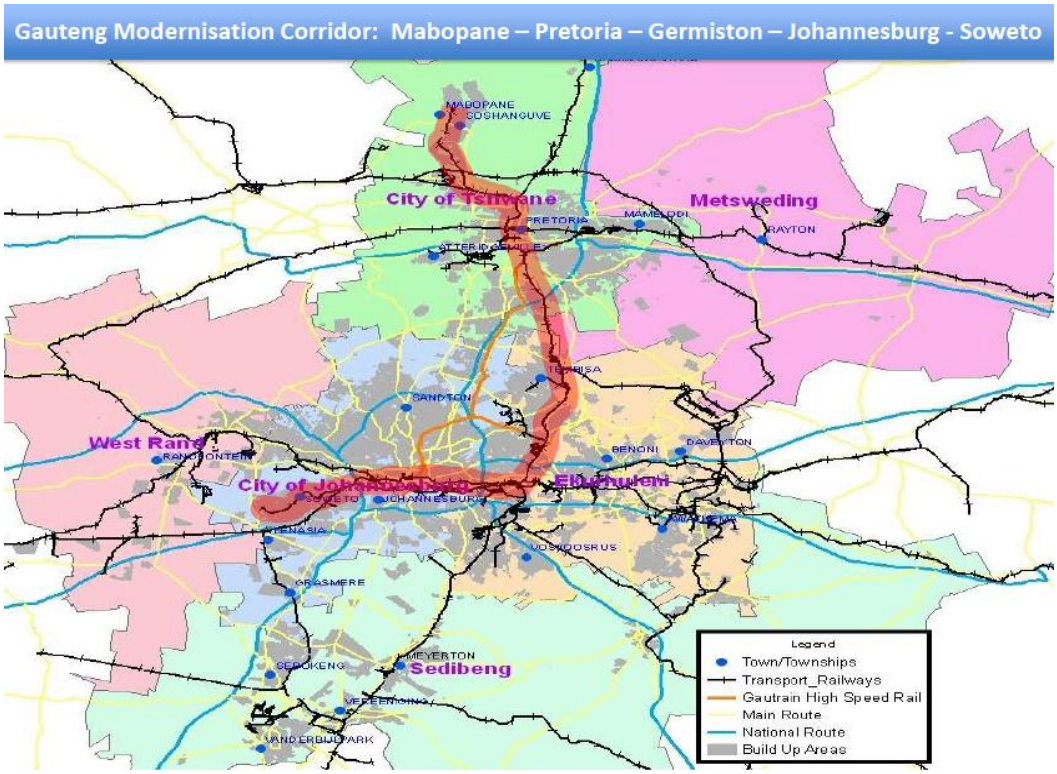


Figure 10.3 – Proposed Rail Extensions in Gauteng South



The PRASA Rail Master Plan also proposes the introduction of a Super Corridor which will be prioritised for its corridor modernisation project. **Figure 10.4** shows the Super Corridor in Gauteng:

Figure 10.4 – PRASA Super Corridor in Gauteng



10.2.6 PRASA Long Distance Passenger Transport

The former South African Transport Services operated a multitude of inter-city rail services, serving all the major centres in the country. These services were mostly operated as a loss in the public interest, and were cross-subsidised from the profits made on the high density freight services.

South Africa has built an international reputation for excellent long-distance services, and brands like the Blue Train, Trans Karoo, Trans Natal, Drakensburg, Algoa Express, etc. were well-known internationally for their excellent service and value for money.

Transnet transferred these services and rolling stock to PRASA Rail.

PRASA has made the major assumption that its inter-city rail operations will not be sustainable under the current conditions and that it is important to determine the true cost of fulfilling its social mandate.

Government Transport Policy requirements to provide services in commercially unviable routes and corridors come at a high cost as the provision of this service cannot be covered from internally generated cash.

The following have to be considered for the Long Distance Passenger Service:

- Long haul passenger services (offered by Shosholoza Meyl) are critical from a transport policy objective in South Africa. There is an estimated 15 million passenger trips in the long distance market annually, with more than 50 percent road-based.
- According to the Automobile Association (AA), more than 14 000 people died in accidents in 2008, with more than 900 000 crashes, at a cost of about R56 billion to the economy or 3.5 percent of GDP compared to about 1 percent in the developed countries. A reduction on road trips, especially during peak periods could contribute in reducing road fatalities.
- For the year ending March 2011, Shosholoza Meyl (the long haul rail service) contributed a loss of R533 million to the PRASA Group. Subsidy from Government was about R366 million, and revenue about R250 million. Among the key operating costs is access and haulage of about R335 million paid to Transnet. This fee is almost the subsidy paid by Government for long distance passenger rail. While Transnet receives R335 million, the on-time arrival rate of the service is less than 30 percent for Shosholoza Meyl services, which Transnet has main control over.
- The dependency on Transnet for the service affects reliability and punctuality. This raises fundamental questions about the viability of the Shosholoza Meyl business under the current environment.

PRASA is currently considering the following available options for the Long Distance Passenger Service:

- Discontinuation of services and selling back the business to Transnet which has apparently not met its commitment in terms of the sale agreement i.e. availing locomotives for Shosholoza Meyl services, prioritising long distance passenger rail in its operations, and reducing delays in the system to optimise travel time.
- Request an increased operational subsidy from government to offset the access and haulage fees and encourage long haul rail (especially regional services). This increase should be considered in line with the potential reduction of environmental damage and fatalities, when comparing with road usage.
- Renegotiation of the Sale of Business Agreement between Transnet and PRASA with the view of reducing access and haulage charges significantly to reflect the subsidised nature of passenger services which should be measured in terms of maintenance costs and real services. The current arbitrary market rate sought by Transnet for access and haulage services should be reviewed. PRASA is further

suggesting the signing of a mandatory Service Level Agreement with penalties for failure by Transnet to prioritise Mainline Passenger Services on its lines.

Against this background, it is clear why no specific planning initiatives are being developed to expand and improve the service, which were previously viewed as an essential service aimed at unlocking the development potential of the rural areas.

10.2.7 Gautrain

The Gautrain Management Agency Planning Approach is clarified by expansion and extensions.

Expansions deal by improvements to the system and the services, largely to address the need for additional capacity. Extensions are aimed at spreading the area of influence of the Gautrain by linking it to other areas by means of a variety of transport links.

- **Expansions**
  - Increase Capacity
  - Additional Stations on existing system
  - Including additional Rolling Stock
  - Improved Operations
  - Improved Information
  - Improved Station Integration

- **Extensions**
  - For the longer term
  - Extend where it is needed
  - Do not duplicate
  - Consider Feeders and Distributors by other modes / technologies

The current focus on the expansions rather than extensions, although it is clear that medium and long-term planning has to be done.

With the development of the Gautrain Rapid Rail Link, it was identified at an early stage that such a railway system with linkages across the metropolitan municipal boundaries, rather than from the dormitory towns to the places of employment would take some time to facilitate changes in land-use development. It was realised that the current land-use densities did not promote the use of public transport, and that higher densities should be sought for this purpose.

It was also realised that the low densities would cause the railway system not to be feasible for “walk-access” passengers alone and therefore it would firstly be required to be well-integrated with the existing public transport services and secondly it is required to provide dedicated feeder and distribution services of a similar quality and frequency than that of the Gautrain services. Park-and-ride facilities were also seen to be essential.

The intention for the longer term was always that additional links to the Gautrain would be required to optimise the capability of the system and to boost its feasibility. Such new links would need to be one or more of the following:

- Additional parking facilities at Gautrain Stations,
- Additional Dedicated Feeder and Distribution Services (bus or mini-bus taxi)
- Extensions of the Metrorail Services to link to more Gautrain Stations (currently Johannesburg Park Station, Pretoria Station, Rhodesfield Station and Hatfield Station, i.e. 40% of the Gautrain stations, have direct transfer access from Metrorail services operated by PRASA, and one other station to ORTIA).
- Linkages by means of BRT services to Gautrain services. A local east-west link at Sandton or Rosebank service may contribute towards better connectivity.
- Linkages by means of extensions of the Gautrain railway lines. The Gautrain has always been planned and designed to enable extensions from Hatfield Station towards the East / South East, from Rhodesfield Station towards East Rand Mall and further east, from Johannesburg Station towards the South or South West, and from Sandton Station towards the West.
- Potentially new railway lines (rapid rail or light rail transit) to serve Gauteng
- Potential linkage with a future high-speed rail link to Durban / Cape Town.

The GMA has not yet done any feasibility studies for such linkages, but has commenced with the identification of the most prominent nodes to be linked. In the interim, more attention is being given to additional parking capacity on the main park-and-ride stations.

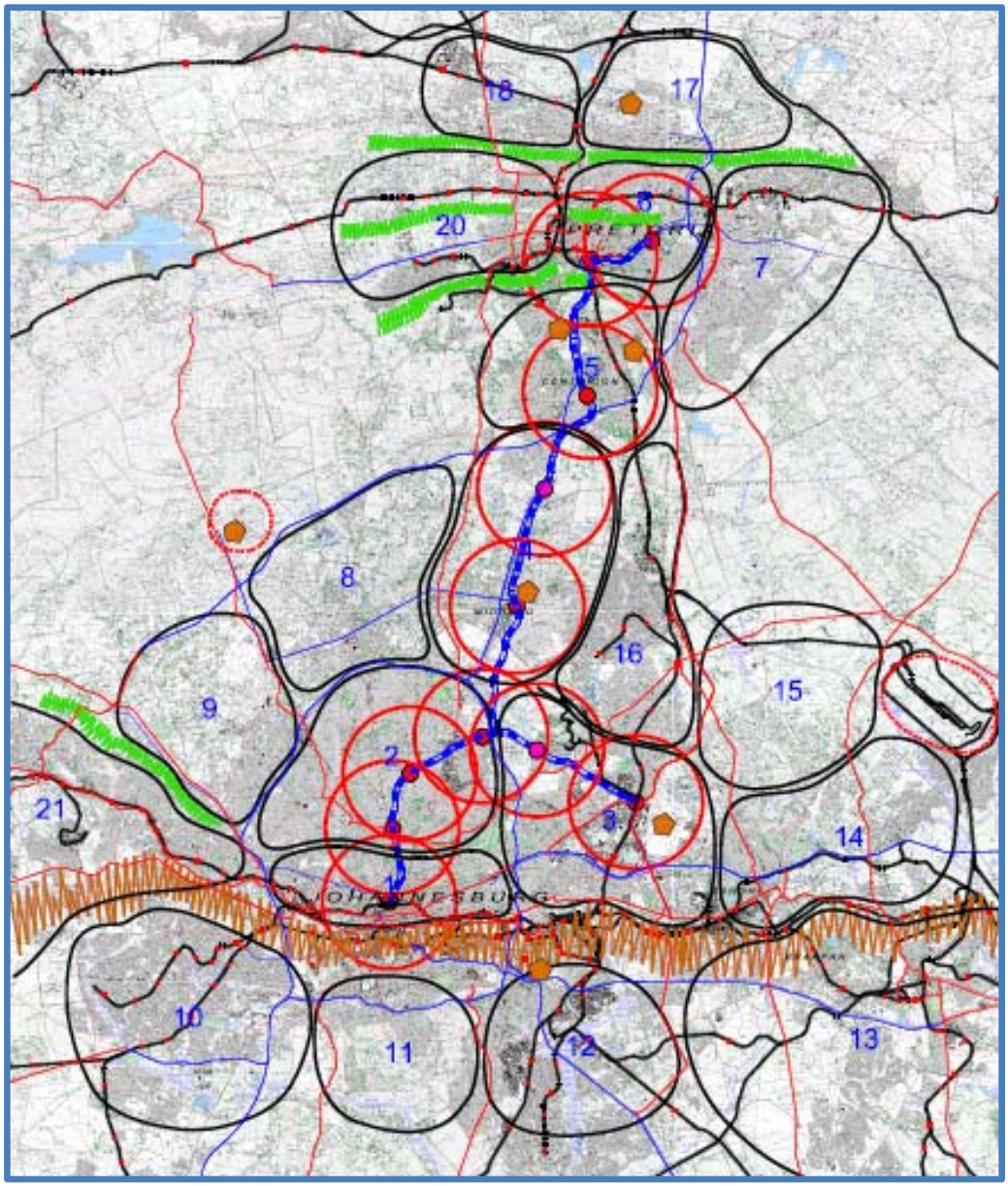
a) Gautrain Development Node Study

The study that commenced recently and which is currently being finalised identified the most prominent development nodes in Gauteng and potential development nodes, as indicated in **Figure 10.5**.

This study found that the existing Gautrain is relatively well located to serve the existing development nodes in Gauteng, and is therefore strategically positioned to enable these nodes to grow to their full potential.

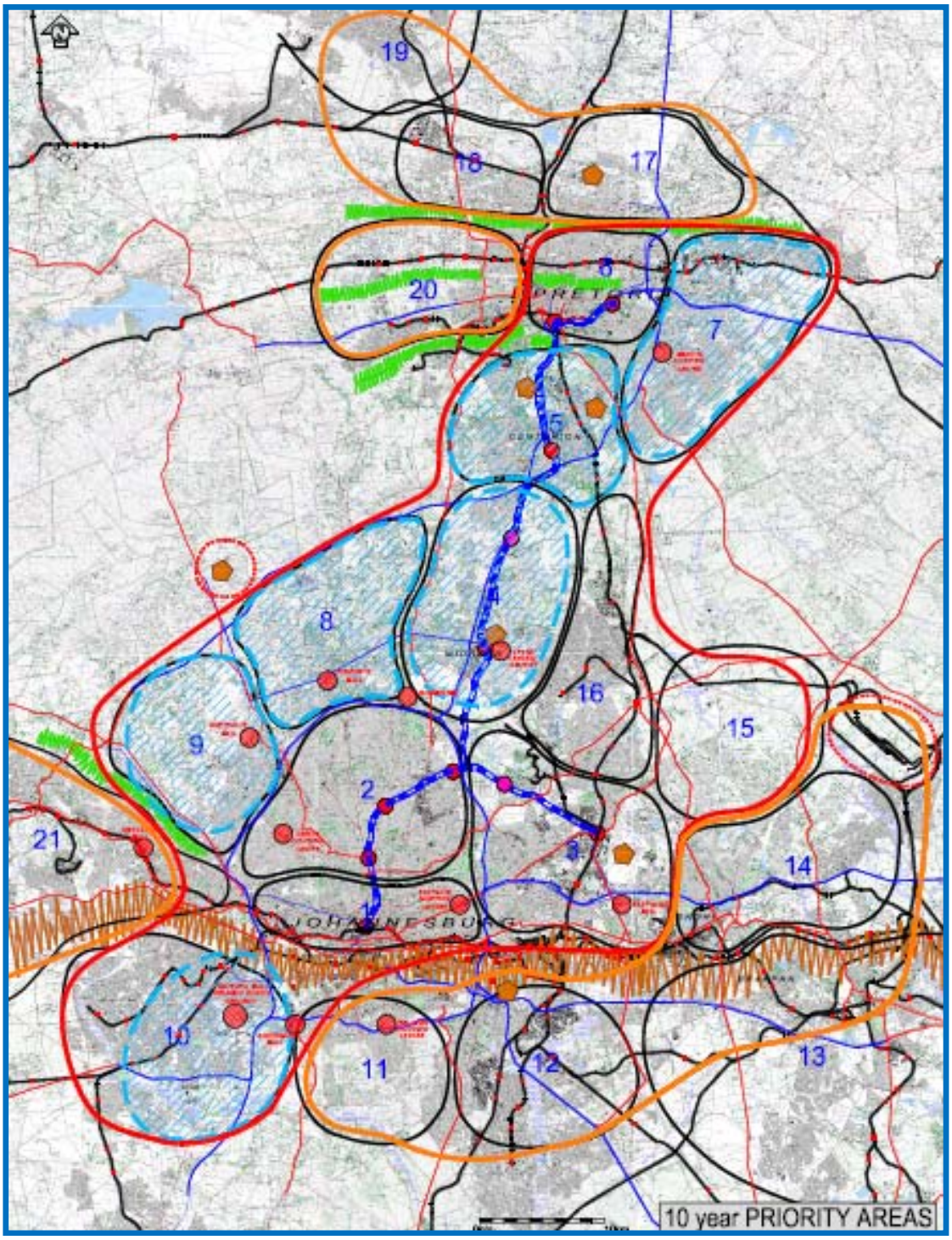
The study also found the most prominent nodes with best economic development potential where improved linkages with the Gautrain should be considered.

Figure 10.5 – Gautrain Development Nodes



The study found that the highest priority nodes where the next linkages with the Gautrain should be sought are in the areas identified **Figure 10.6**.

Figure 10.6 – Gautrain High Priority Nodes



b) Key Modal Transfer Facilities

In essence, each railway station acts as a modal transfer facility. It is, of course, not possible to develop a proper integrated multi-modal public transport system without adequate modal transfer facilities. Rail also relies on proper integration with other modes of transport.

Too often in the past, a taxi rank or bus terminus was constructed next to a railway station, but with little attention to providing a seamless transfer for passengers from one service to another.

In a future multi-modal public transport system with proper seamless transfer between modes

of transport, more attention needs to be given to integration, and proper facilities that provide short, comfortable, easy transfer facilities over paved areas and under roof from one mode to another. It is proposed to develop and maintain a hierarchy of transfer facilities, such as:

- **Transfer Facilities of International / National Significance**
  - Johannesburg Station
  - Pretoria Station
  - OR Tambo International Airport
  - Gautrain Sandton Station

- **Transfer Facilities of Provincial Significance**
  - Germiston Station
  - Kempton Park Station
  - Belle Ombre Station
  - Westgate Station
  - Faraday Station
  - Mabopane Station
  - New Canada Station
  - Oakmoor Station

- **Transfer Facilities of Local Significance**
  - **Figure 10.7** shows the busiest stations in Gauteng South
  - **Figure 10.8** shows the busiest stations in Gauteng North

Figure 10.7 – Busiest Stations in Gauteng South

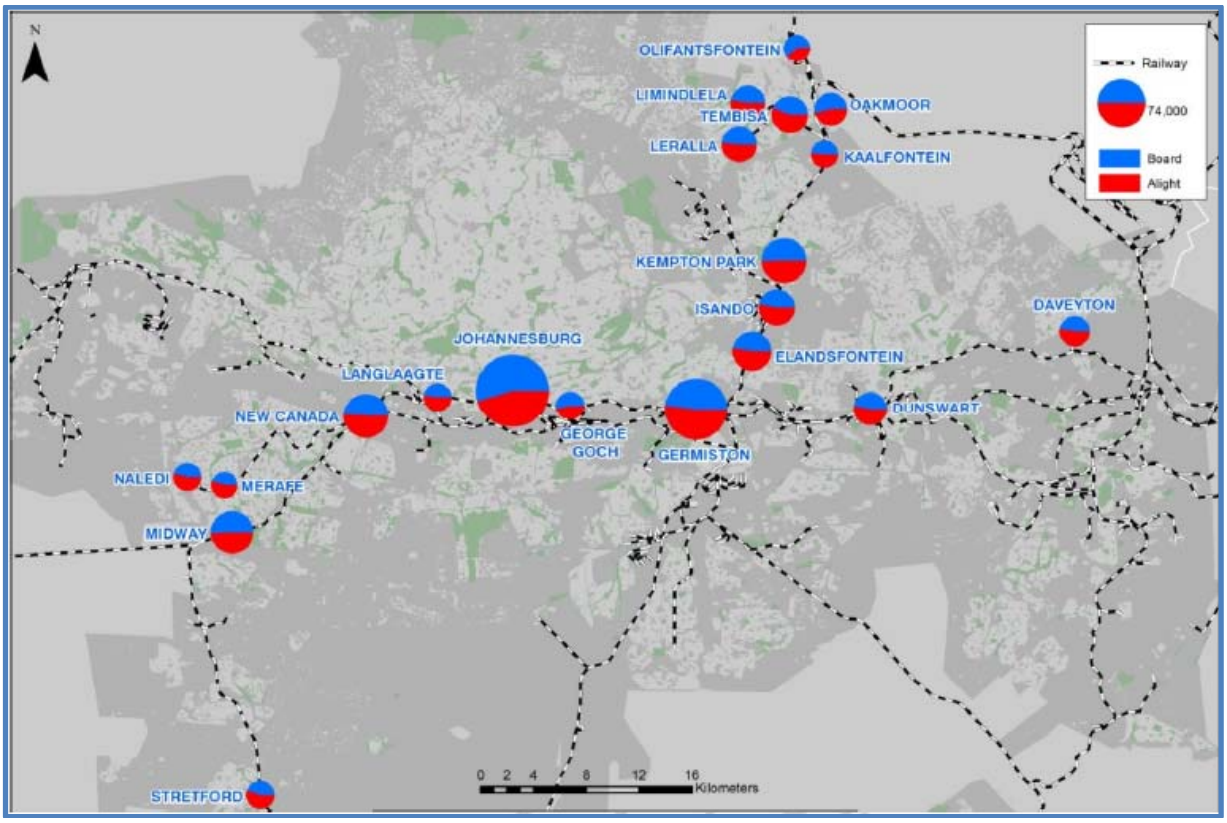
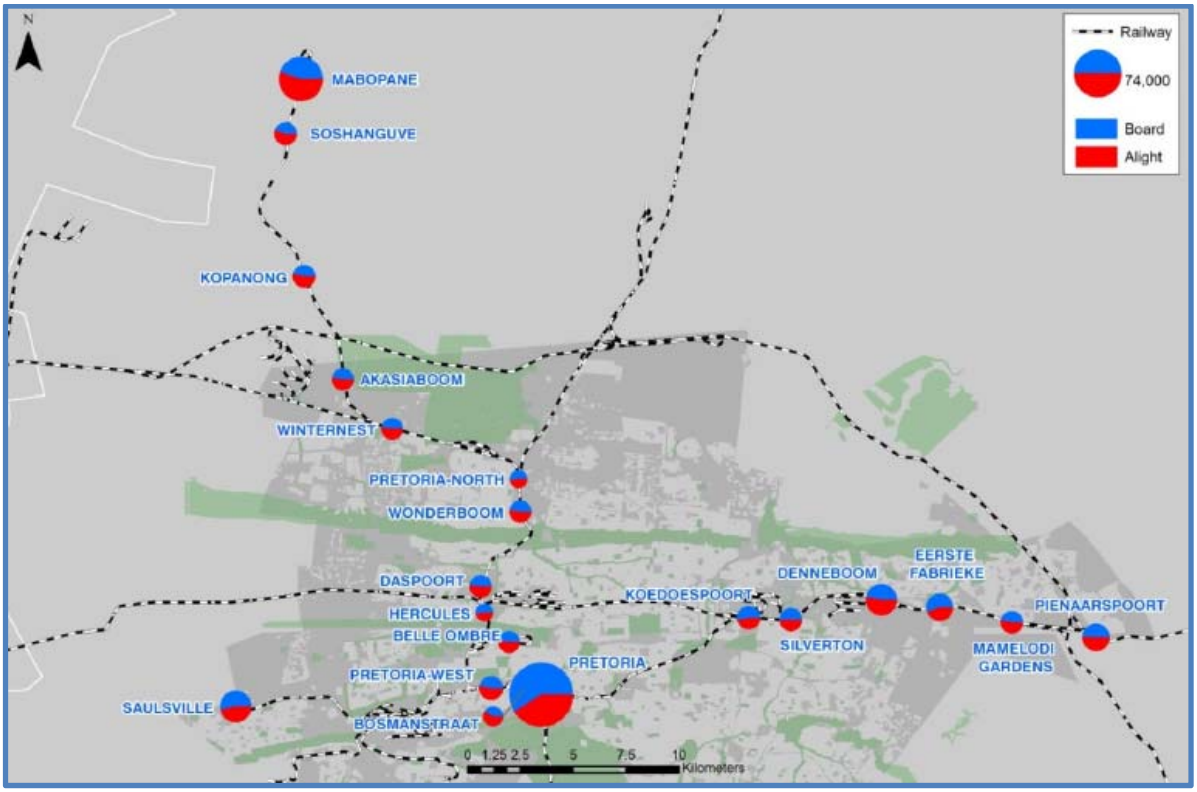


Figure 10.8 – Busiest Stations in Gauteng North



10.3 Current Realities / Status Quo of the Gauteng Rail System

10.3.1 PRASA Commuter Rail

The existing PRASA / Metrorail services were developed over many decades. Most of the main lines over which these services are operating were initially constructed in the first part of the previous century and were at that stage aimed at providing connectivity on a national basis. The suburban rail services in Gauteng (such as the Springs – Randfontein and Pretoria – Germiston – Johannesburg services were developed later (also before South Africa became a republic in 1961). New railway lines were linked to this spine after 1957 and 1961, many to support the apartheid land-use policies as the lower income people living in townships far from the CBDs had to be given affordable / low cost access to their places of employment. This led to the construction of lines such as:

- the Soweto line,
- the Tembisa Line,
- the Attridgeville line,
- the Daveyton line, and
- the Mabopane line.

Other commuter rail services were established with new stations along existing railway lines, such as the Mamelodi services along the Pretoria – Denneboom – Eerste Fabrieke – Pienaarspoort line going towards Maputo.

Some services were withdrawn over time, the most notably are:

- the Pretoria – Rayton – Bronkhorstspruit service,
- the Hammanskraal – Pretoria service, and
- the Alberton – Germiston service.

Such integrated public transport approach must also address and rationalize feeder services to rail stations, without which the rail system cannot achieve its full potential as rapid mass mover and back bone of the public transport system.

The current inadequate passenger rail service provision is a result of four decades of underinvestment in rail rolling stock, infrastructure and operations.

The massive under-investment in rail in Gauteng has not only resulted in ageing and obsolete rail infrastructure and rolling stock, but also resulted in rail being unable to respond and expand appropriately to new growth and development nodes, such as the North-Western quadrant of Johannesburg and the rapid changing urban landscape of outlying areas of Ekurhuleni, Tshwane, Metsweding, West Rand and Sedibeng.

The public transport modal share for rail services by PRASA in Gauteng is currently under 10%, and declined from 17% in 2008/09.

This equates to 1,3 million daily Metrorail passengers in Gauteng, making up almost half of the national daily rail trip volumes in the entire country. The trend over the past number of years indicate rail passenger volumes decreasing by 25% in Gauteng since 2009, although a recovery increase of 10% has been recorded over the past year, with 256 million passenger trips for the 2011/12 financial year.

PRASA Rail's Operational Effectiveness Program is proving to result in the desired impact on service delivery improvements, while the system is being modernized over the next 3 to 5 years.

Interventions through the Operational Effectiveness Program include:

- Preventative and night time maintenance
- Improved communication with customers
- Response teams and capital interventions program to mange service failures
- Improved safety management, security and fare collection
- Improved train availability and scheduling
- Extended hours of services, performance management and training

Challenges affecting the performance of the rail commuter system include:

- Obsolete rolling stock fleet as indicated in **Figure 10.9** – Poor service availability, punctuality (as indicated in **Figure 10.10**) and capacity
- Obsolete signalling system affecting capacity, frequencies and performance and potentially also safety
- Ineffective maintenance regimes with ageing rolling stock fleet and availability of spares
- Poor reaction capabilities for service recovery within an obsolete system
- Ageing electrical infrastructure (sub stations)

- Ageing and failing perway (track) and substructures
- An open system with lack of fencing, ticketing and gate control systems, leading to vandalism and fare evasion
- Effectiveness of personal safety and security
- Accessibility and reach of the commuter system (station accessibility, lack of feeders/integration and lack of rail extensions to serve new settlement patterns and development areas)
- Lack of integrated land-use spatial and transportation planning
- Commuter rail makes use of “deficit subsidies” and there is minimal incentive to perform as losses and inefficiencies are automatically catered for in the deficit subsidy.

Figure 10.9 – Commuter Rail Rolling Stock Age Distribution

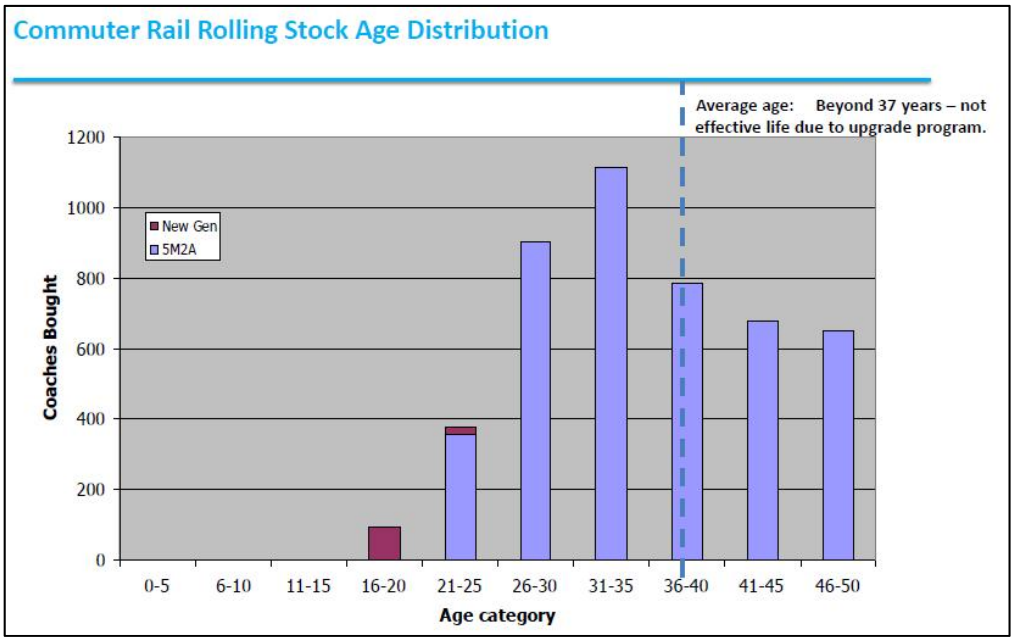
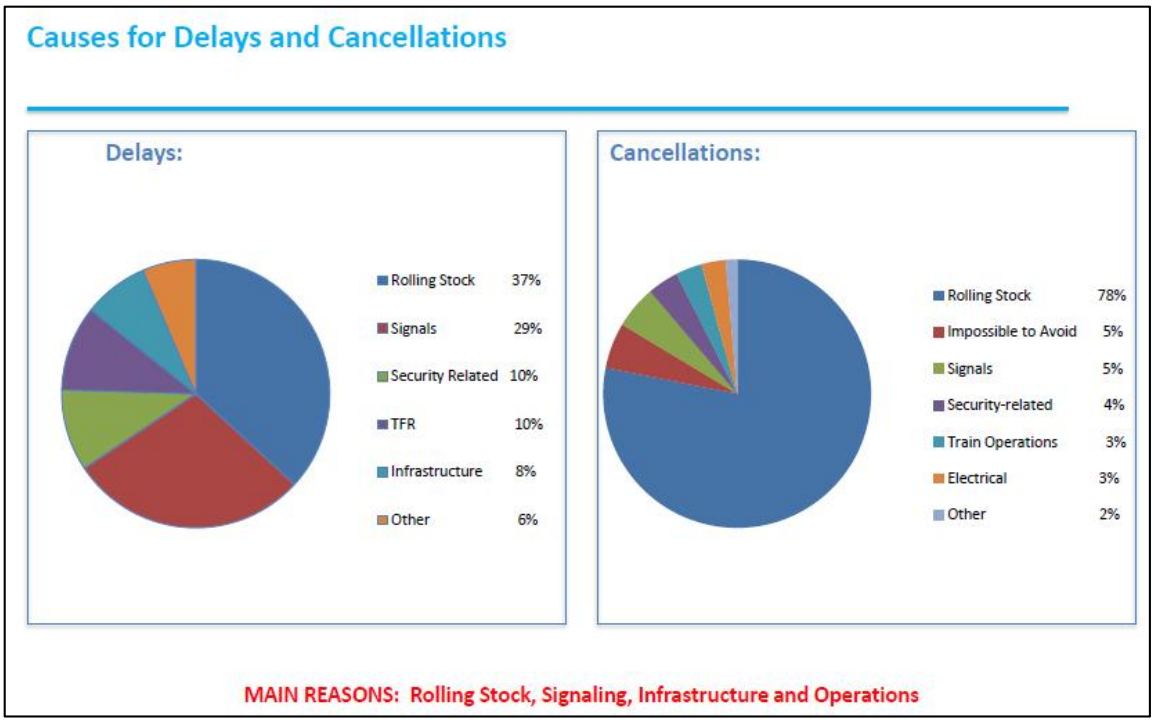


Figure 10.10 – Causes for Delay and Cancellations



Other problems are that the train services are often overcrowded in the high peak periods as indicated in **Figure 10.11**.

Figure 10.11 – Peak Period Overcrowding

The net result of these problems is that the PRASA passengers are generally highly unhappy with their service levels. The service is as a result mostly for the captive who can only afford low fares.

10.3.2 PRASA Long Distance Passenger Transport

Shosholoza Meyl owns over 900 rail coaches, of which 706 coaches are operational and 461 are actively used for passenger transport.

The fleet is ageing and 33% of the coaches are older than 30 years, while all coaches in service are older than 20 years.

In addition a total of 124 locomotives were transferred with this business from Transnet to PRASA, of which only 37 were operational. PRASA Rail has since increased this number to 57 operational locomotives by end of November 2011. The asset indicators are shown in **Table 10.2**.

Table 10.2 – Assets owned by PRASA and operated by Shosholoza Meyl

Region	Stations			Track Km			Coaches
	PRASA Owned	**TFR Owned**	**Total Used**	**PRASA Owned**	**TFR Owned**	**Total Operated On**	**PRASA Owned**
Premier Class	7	0	7	325	2894	3219	77
Tourist Class	12	36	48	325	5782	6107	159
Economy Class	46	49	95	169	9591	9760	675

PRASA Rail, 2011

Shosholoza Meyl is materially reliant on Transnet Freight Rail for the provision of the railway track and support services such as train control to enable it to operate. Shosholoza Meyl serviced twenty-one routes in the past, covering 83 operational stations between major destinations in South Africa. This was done under the ownership of either PRASA or Transnet Freight Rail (TFR). It carried approximately over 4 million passengers per annum, many of whom were migrant workers travelling between the rural areas and the Metropolitan centres of South Africa, as well as migrant workers from neighbouring countries such as Mozambique, Malawi, Zimbabwe, Lesotho & Zambia. The sitter or economy class travellers contributed 87.5% of the total revenue of the business.

The due diligence exercise carried out prior to the Sale of Business Agreement with Transnet, indicated the need for an annual subsidy in excess of R1bn to operate the mainline passenger business. Funding for this service was capped at R500m in the first year and was progressively reduced in the MTEF allocation to PRASA.

Following the 2010 FIFA Soccer World Cup, PRASA had to rationalize the service as the loss in excess of R500m could not be sustained. In addition the service levels from a timekeeping perspective remained poor (below 30% of trains on time at destinations) as a result of access problems related to Transnet, as well as unavailability of locomotives. This resulted in a drop of passengers to 1,5 million per annum.

As from 1 October 2011, a rationalized service covering only 7 routes of 38 trains per week and a further 2 trains per month on Premier Class to Durban was introduced. This was aimed at providing a reliable service linked to the available resources especially locomotives. During high peak periods such as December/January and April additional services are scheduled for seasonal demand.

10.3.3 Gautrain

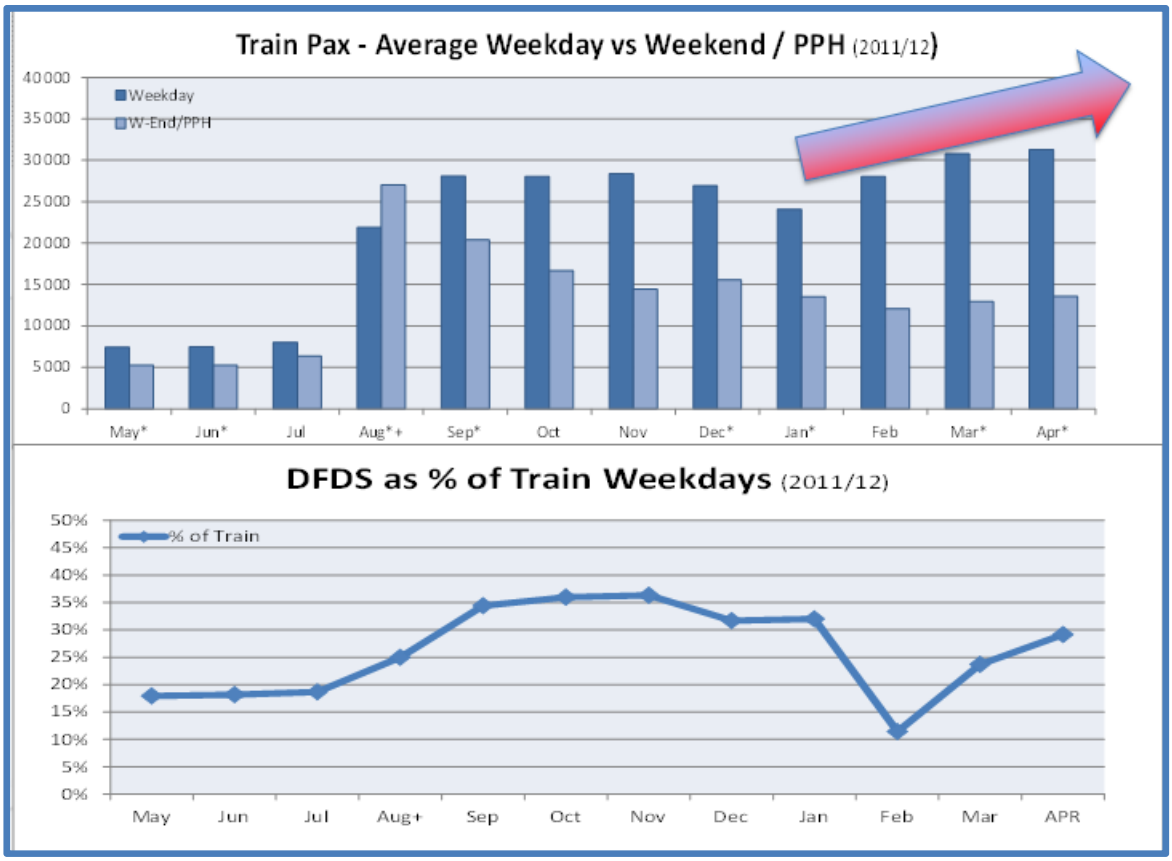
The final phase of the Gautrain services commenced with operations on 7 June 2012, when the section between Rosebank and Johannesburg Park Station was opened to the public. The first phase of the Gautrain commenced with operations on 8 June 2010, shortly before the 2010 FIFA Soccer World Cup. Gautrain transported its 10 millionth passenger on 21 June 2012, shortly after the full system was operational.

The Gautrain has already significantly demonstrated that it has been successful in its objective to promote the use of public transport, as many of its users have never or seldom used public transport in the past. It was also successful in attracting car users and serves tourists as well. **Figure 10.12** shows an upward trend in the use of the Gautrain services, particularly after the major negative impact of the bus driver strike in February 2012.

Since the section between Rosebank and Johannesburg Park Station was opened on 7 June 2012, there has been a further steady increase in the number of passengers on the Gautrain services. This is in line with the expectation of patronage on new passenger railway systems, which typically shows a significant ramping up during the first five years of operations. However, the Gautrain Management Agency will have to ensure that it can provide the necessary service capacity increases in this process.

The expectation also was that the Gauteng toll road system would have been introduced at this stage of the Gautrain development. Previous modelling showed that there will be a significant increase in Gautrain passengers once the toll system is introduced, on the condition that sufficient service capacity exists.

Figure 10.12 – Gautrain Passenger Volumes (Weekday and Weekends)



10.4 Rail Planning and Implementation Initiatives

10.4.1 PRASA Commuter Rail

PRASA's stabilization strategy for the rail commuter system over the past three years included the planning and preparation for an aggressive rolling stock refurbishment program, together with selective station and infrastructure improvements that started in 2008/09 to prevent the rail commuter system from total collapse.

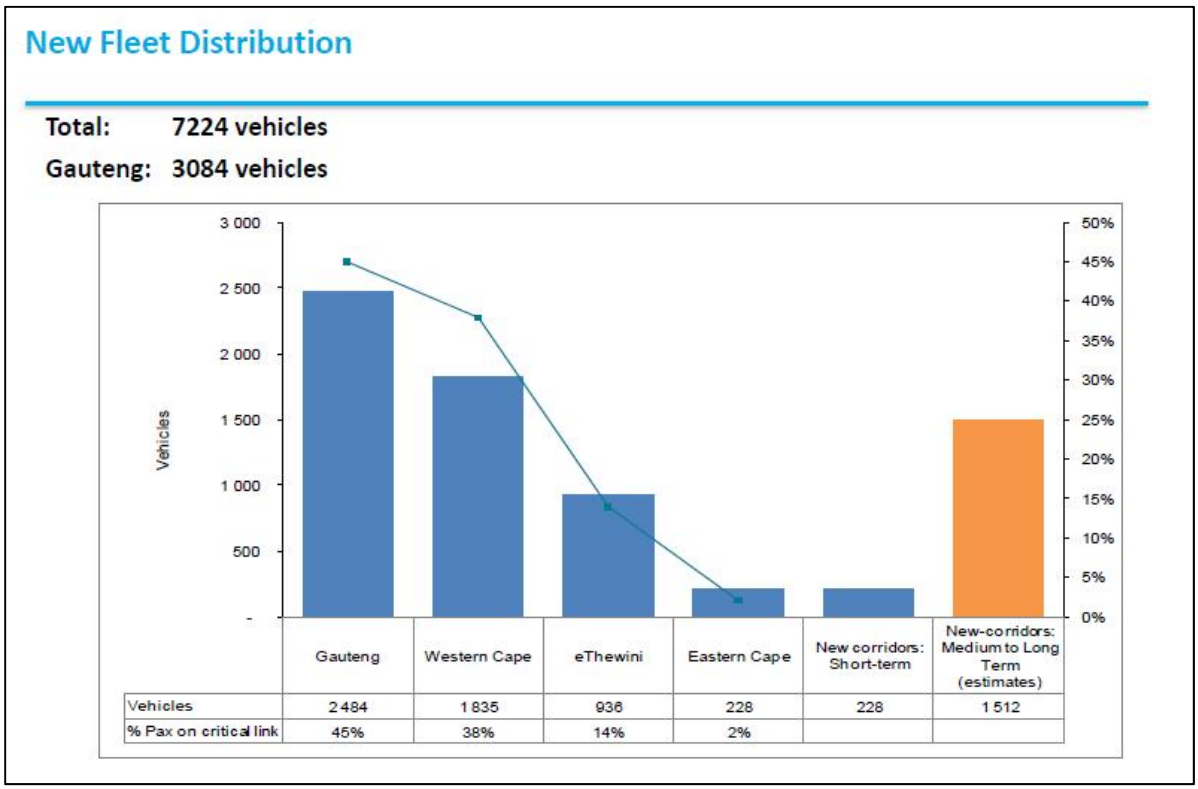
A total of 2 000 coaches at a cost of R7bn was overhauled or upgraded nationally, with 870 coaches completed for Gauteng (Johannesburg and Tshwane). Forty stations were upgraded with operational enhancements and SAPS facilities were created at eleven key stations. The 2010 World Cup preparations provided a further catalyst for major upgrading of six stations, three new stations, improved infrastructure at Nasrec, and providing improved customer communication system at various stations in Gauteng.

The critical priorities for PRASA over the next three to five years include the modernization of the existing passenger railway system and championing the implementation of new

passenger rail technology. The modernization of the signalling, telecommunication system, rolling stock and train operating systems will lay the foundation for a modern, efficient and sustainable rail transport system in Gauteng.

National Treasury has significantly increased capital allocations to PRASA for its infrastructure modernisation program starting in 2012, and totalling R25,9bn over the next 3 year MTEF period. The funding of the infrastructure modernisation program is specifically aimed at fully modernising the infrastructure in preparation of new rolling stock acquisition program. The acquisition program includes new rolling stock manufacturing facilities in South Africa, a specified local content of 65% and an investment of over R137bn over the next 20 years. A total of over 7000 coaches will be manufactured in South Africa. A total of 2484 new coaches and a further 600 coaches for new services are included in the Acquisition Program for Gauteng as illustrated in **Figure 10.13**. The first new trains are expected into system by 2015.

Figure 10.13 – PRASA New Fleet Distribution



The infrastructure investment allocation for the Gauteng rail network is in excess of R10bn over the next 3 years. The investment program includes:

- R3bn for the upgrade of existing trains in Gauteng to ensure continuity of the service until the new trains are introduced into the system.
- R4bn for the signalling modernization over the next 5 – 7 years. Work on Phase 1 of this project valued at R1bn has already started. The project will increase train safety and network capacity optimisation over the short term, and will lay the foundation for full digital signalling and automatic train protection in future.
- Corridor Modernisation project – complete remodelling of Mabopane - Johannesburg – Naledi corridor. 4bn earmarked for track, platform, station and electrical infrastructure rehabilitation
- New gate control systems, electronic display boards and CCTV cameras at major stations to improve access control and security. R900m has been allocated for installations in Gauteng over the next 3 years. New PA systems at 40 stations in Gauteng. Pretoria station completed.
- Station upgrade program: Mabopane (R260m) plus additional 7 station upgrade projects and 20 station improvement projects
- Station modal integration projects in conjunction with Province and authorities: Stretford, Leralla, Vereeniging, Germiston and Roodepoort
- 5 stations identified for Universal access pilot projects
- Corridor public works job creation program: Cleaning of corridors, fencing and walling of stations.
- Three corridors on the Gauteng rail network have been prioritised to spearhead modernisation in preparation of the new rolling stock. The corridors include:
    - Mabopane – Pretoria
    - Pretoria – Germiston – Johannesburg
    - Johannesburg – Soweto

The first new trains expected by 2015 will be deployed on these priority corridors and a total of over R4bn has been earmarked for the modernisation of track and electrical infrastructure, access to stations, station facilities and station upgrades. A number of these station upgrades include joint project development with Gauteng Provincial Government and local authorities to create fully integrated intermodal facilities at stations.

- In order to prepare for increasing demand for rail commuter services, a capacity enhancement project with the doubling of lines, upgraded stations and building a

new station on the Mamelodi – Greenview corridor, to the value of R460m, will be completed within the next 18 months.

- Planning and feasibility work have also commenced on the reintroduction of rail services on:
    - Re-introduction of Hammanskraal services: Line rehabilitation and 3 new stations – R800m
    - Improved integration with Gautrain through Tshwane ring rail and City distribution networks
    - Daveyton rail extension (More than 50% of Ekurhuleni population reside in Daveyton) – R2,5bn
    - Bara link rail extension which includes capacity enhancements to transform Nasrec station as a major connectivity and feeder hub with rail, to serve areas of Ekhaya, Orlando, Bara, and Aeroton - R3bn
    - BRT and Park 'n Ride possibilities already in existence

10.4.2 PRASA Long Distance Passenger Transport

PRASA is also planning to procure 20 new locomotives over the next three years for the mainline passenger services. This has been planned in support of the urgent priorities of PRASA to improve the current service, achieve service excellence, modernization and increase revenue. A budgeted cost of R502m has been included for the purchase of these locomotives over the 2012 MTEF period. This is done in support of Johannesburg – Queenstown, Johannesburg – Cape Town, Johannesburg – Nelspruit and Pretoria – Polokwane routes.

10.5 Gaps and Inconsistencies in Planning and Implementation

10.5.1 Rail integrated BRT planning

The most recent Ekurhuleni BRT planning is an example of an attempt to integrate rail and BRT integrated planning. It is an opinion that:

- Existing and possible future rail as trunk routes should be considered as a given in planning
- the correct mode should be selected for a corridor to correspond to current and future passenger volumes and distance
- BRT trunk routes should not compete or duplicate rail

- The role of feeder and distribution services inclusive of BRT, Bus and Taxi should complement the holistically planned transport network and systems

The stepwise planning of the Ekurhuleni BRT planning is shown in the diagrams as **Figure 10.14**, commencing with:

- Rail
- BRT supporting and augmenting
- Feeder and distribution services

It is however clear that the Vosloorus Triangle proposed ring-rail is not considered as a future rail corridor, as proposed in the GTMA report, with the BRT Planning.

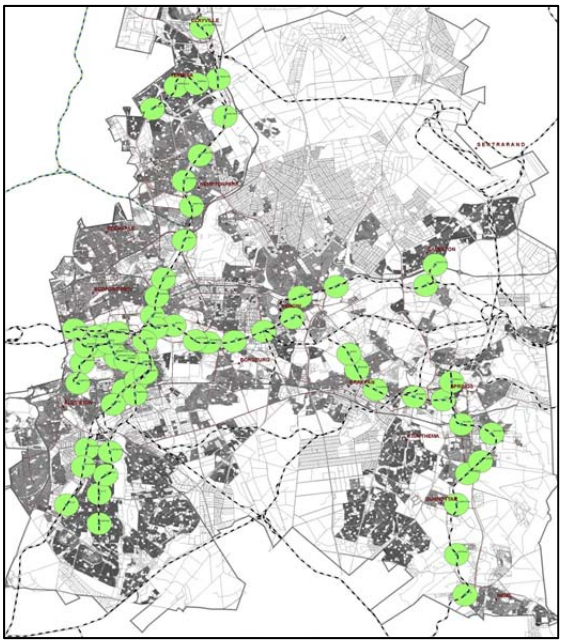
Similarly in Tshwane, it is not clear whether the Akasiaboom - Sandputs and Soutpan Road - M80 rail link was considered as a future rail corridor, as proposed in the GTMA report, with the BRT planning.

Mode specific planning in the Municipalities is not totally integrated with regards to appropriate technology (mode), integrated services, and cross-boundary coordination.

There is significant infrastructure investment in commuter rail. However, there is need for optomisation and integration of the commuter rail service with the road based services. Therefore, the operational plans for commuter rail must be reviewed in context of an integrated public transport system.

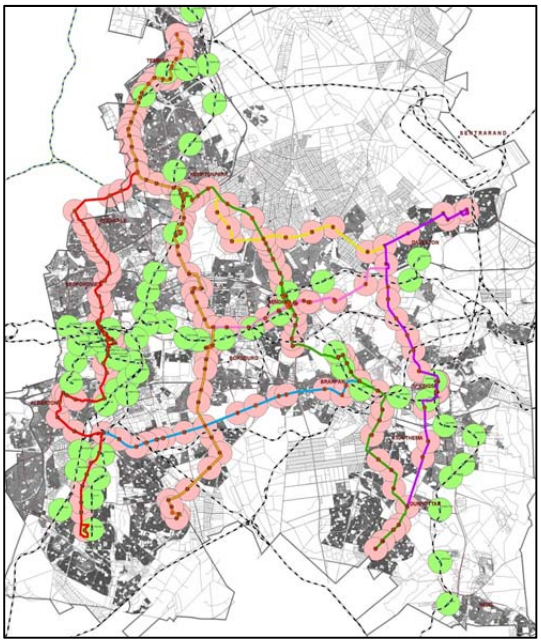
Figure 10.14 – Ekurhuleni Integrated Public Transport System Plan

Rail Network - 1km area coverage



Rail Network - 1km area coverage

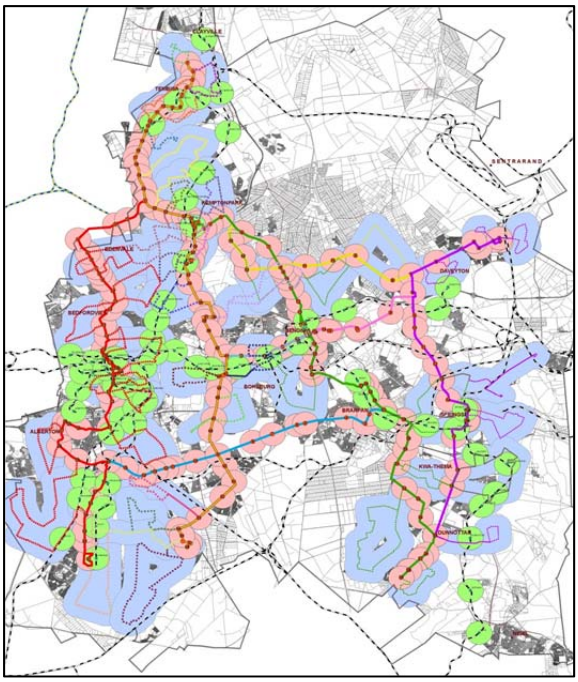
BRT Network - 1km area coverage



Rail Network - 1km area coverage

BRT Network - 1km area coverage

Feeder Network - 1km area coverage



11 FREIGHT LOGISTICS TRANSPORT

11.1 Introduction

A fundamental prerequisite for growth is the expansion of trade. However, it is the transport linkages that enable the exploitation and development of natural and human resources. Therefore, a country or region that has an inefficient and ineffective transport sector, would find it extremely difficult, if not impossible, to trade competitively.

A region that is well equipped to receive, sort and rapidly deliver goods and services cheaply and effectively stands to profit considerably from these abilities. On the other hand, deficiencies in this regard severely retard competitiveness and as a result encourage the transfer of economic activity to more favourable locations.

By providing infrastructure, facilitating collaboration between government and the private sector and by means of appropriate regulation of the freight transport industry, the provincial government could play a considerable role in ensuring that Gauteng is an attractive location for establishing and continuing with sustainable business.

Transportation of freight is a vital element in planning for prosperity, albeit one that tends to have been superficially dealt with in transportation planning departments at all levels of government. The overarching objectives of all freight transport are by definition, the economic efficiency of the movement of goods so that freight transport policy and investment is primarily directed at creating conditions that support that objective. In South Africa a very large proportion of freight transport movement is provided by parastatal government monopoly organisations affiliated to railways, ports, pipelines, and air transport.

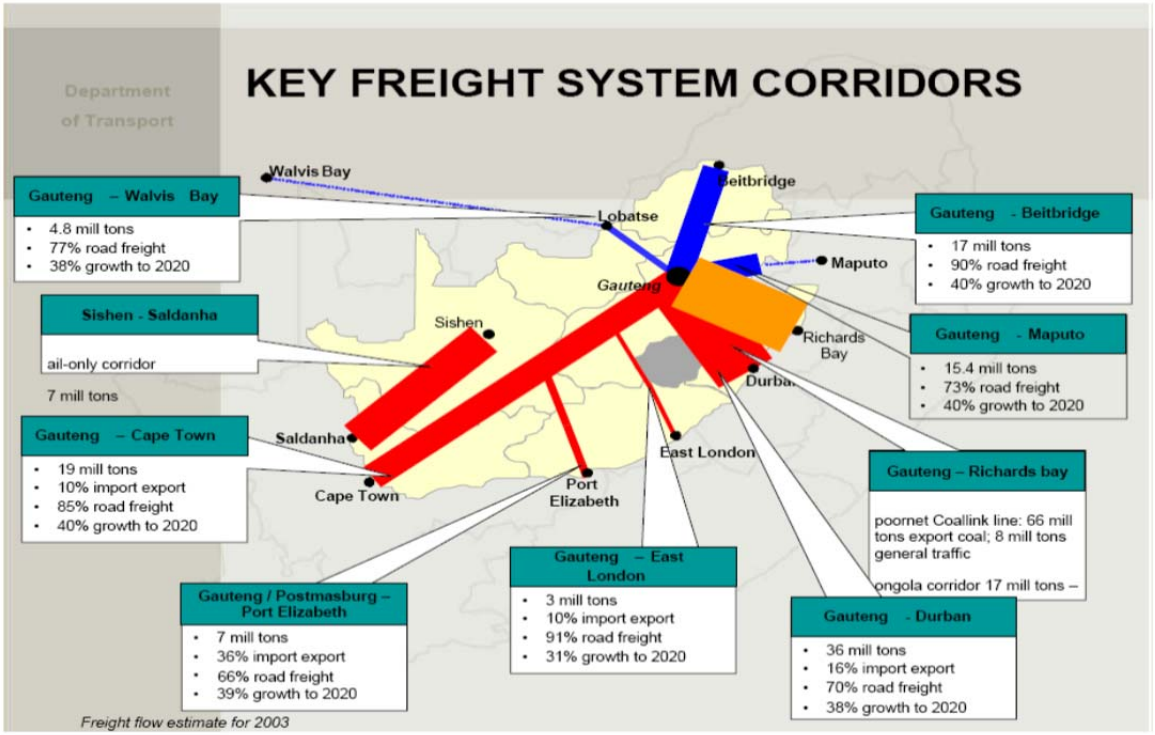
Figure 11.1 shows the importance of the Gauteng Province in the movement of freight throughout South Africa.

In compiling the ITMP25 for Gauteng, the Freight Logistics Plan (FLP) will form an integral part of the total planning process. This report deals with the status quo of freight logistics within Gauteng.

The aspects discussed in this report include:

- The Gauteng freight transport profile
- Planned infrastructure.

Figure 11.1 - Importance of Gauteng in the movement of freight throughout South Africa



Source: DOT presentation at the first Maputo Freight Logistics Forum Multilateral Stakeholders Meeting on 22 May 2007. Data is based on information contained in the DOT's National Freight Logistics Strategy document.

11.2 Modal and Infrastructure overview

11.2.1 Introduction

The provision of sufficient economic infrastructure in Gauteng is critical for the local and national economy, as the province is a hub of economic activity and contributes more than half of all domestic tax collections.

The estimated overall land freight market in South Africa is approximately 1.6 billion tons p.a. (1 593 mt) with 177 million tons on rail and 1 416 mt on road. Nearly 89% (88.9%) of land freight in South Africa is transported by road and just more than 11% (11.1%) by rail. In terms of ton-km, a total of 377bn ton-km is travelled over land with road freight being responsible for 70% and rail for 30% of ton-kms travelled.

11.2.2 Road Freight

Table 11.1 reflects the Gauteng road network as it relates to the national network.

Table 11.1 - Gauteng Road Network

	National Network	Provincial network (paved + unpaved)	Local network	Total
Gauteng	588	6308	28830	35726
National	16197	223878	200106	440181
Gauteng %	3.63	2.82	14.41	8.12

Source: NATMAP

Although data on the share of each transport mode on a provincial basis is not freely available in the public domain, a rough estimate of Gauteng's transport mode share can be derived by excluding sea transport and auxiliary transport activities from the national breakdown. As shown in **Table 11.2**, road freight transport is estimated to be the second largest transport mode in Gauteng, with a share of approximately 32.4% in the total transport sector.

Table 11.2 - Gauteng share of different transport modes

Gauteng share of transport modes by income	Estimated share
Rail	19.1%
All land passengers	8.6%
Road freight	32.6%
Pipeline	1.3%
Air transport	38.6%
Total	**100%**

Source: Economists.co.za

These income shares can be used to derive an estimate of the importance of the Gauteng road freight sector to both the provincial and national GDP. Gauteng road freight comprises only 0.6% of South African gross domestic product. However, Gauteng road freight makes up around about 1.8% of Gauteng's GDP (and Gauteng in turn contributes nearly 35% of South African GDP).

Road freight operations in Gauteng consist of the terminal sections of six different freeway systems that feed into the urban industrial areas of the province. The Gauteng province is the centre of industrial activity in South Africa with the result that large flows of raw materials are received on the six major national routes which are the N3, N4 (east and west), N1 (north and south), N12, R21, and N14.

There are more than 100 registered industrial areas in Gauteng, many of which are very extensive and are major generators of road freight transport. These industrial areas use road freight transport for steel, cement, consumer-manufactured goods, heavy industrial steel and concrete structures, ready-mix concrete, retail and wholesale distribution of foodstuff and meat and vegetables.

One feature of road freight operations in Gauteng is the extent to which bulk commodities such as steel, coal, cement, and bulk grains have moved from rail transport to road. The efficiency of road freight transport in Gauteng is increasingly being reduced because of the congestion on the main through routes in urban areas. In order to improve operational efficiency in the CBD there is a need for urgent reassessment of the accessibility of some industrial areas and in particular, the access to the City Deep container terminal in relation to the newer industrial areas which are increasingly being established at greater distances from the container terminal.

A feature of the management of road freight operations in the Gauteng area has been the inconsistent and ineffective control of overloading. Weighbridge locations are unsuitable and the levels of activity are generally incapable of restraining the practice of overloading. Increasing congestion is leading to conflict between light and heavy vehicles at peak periods so that accident rates involving heavy goods vehicles are increasing all over the province.

Due to the unavailability of reliable data of road freight volumes in Gauteng one needs to adopt a national perspective. **Table 11.3** reflects the movement of road freight on national corridors.

As shown in **Table 11.3**, the major corridor freight movements by road are between Gauteng, Durban and Cape Town. The volumes on the N1 to the North of Gauteng have reduced due to the situation in Zimbabwe and the use of the N11 via Martin's Drift for freight to northern Namibia, Zambia and the DRC. In the evaluation of freight movements on the identified corridor routes it is essential to bear in mind that there are elements of double counting that are unavoidable, for example, the tonnage shown on the N5 between

Harrismith and Winburg may have been duplicated on the N3 at one end or the N1 south at the other, or both.

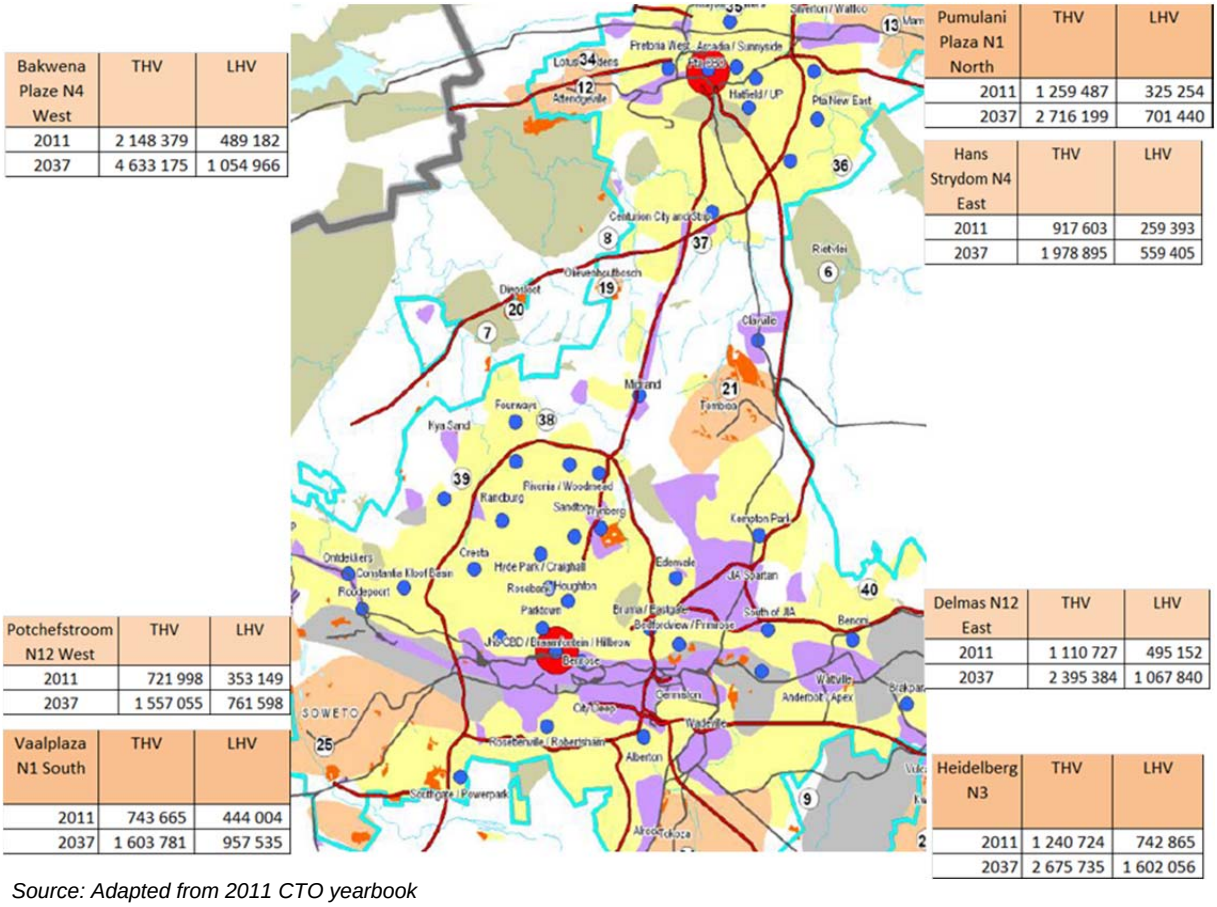
Table 11.3 - Annual Road Freight on National Corridors (2007/08)

	Corridor	Corridor Name	Tonnes P.A. (Millions)
1	N3/N11	Gauteng-Durban	41,5
2	N1 South/N12	Gauteng-Cape Town	12,7
3	N1 North	Gauteng-Musina	9,8
4	N4 West	Gauteng-Lobatse	2,3
5	N4 East	Gauteng-Ressano Garcia	3,2
6	N7	Cape Town-Namibia	2,5
7	N2 South	Cape Town – Port Elizabeth	3,3
8	N2 North	East London-Durban-Pongola	7,4
9	N5	Winburg-Harrismith	6,7
10	N14	Gauteng-Upington	2,4
11	N6	East London-Bloemfontein	1,4
12	N9	George-Colesburg	1,8
13	N10	Britstown-Nakop	0,3
14	N17	Gauteng-Swaziland	3,0
15	N8	Thaba Nchu-Maseru	2,76
		TOTAL	**101,0**

Source: National Transport Master Plan

Figure 11.2 illustrates the number of heavy vehicles moving to and from Gauteng on the road network. If the number of heavy vehicles growth at a rate of 3% per annum it implies that the number of heavy vehicles is more than double what we currently have on the road network. This has a direct impact on the volume capacity ratio of the roads and maintenance practices to follow. The strategy would rather be to channel the freight vehicles around the CBD on well-established freight roads or routes

Figure 11.2 - Heavy Vehicle Volumes on the Gauteng Road Network

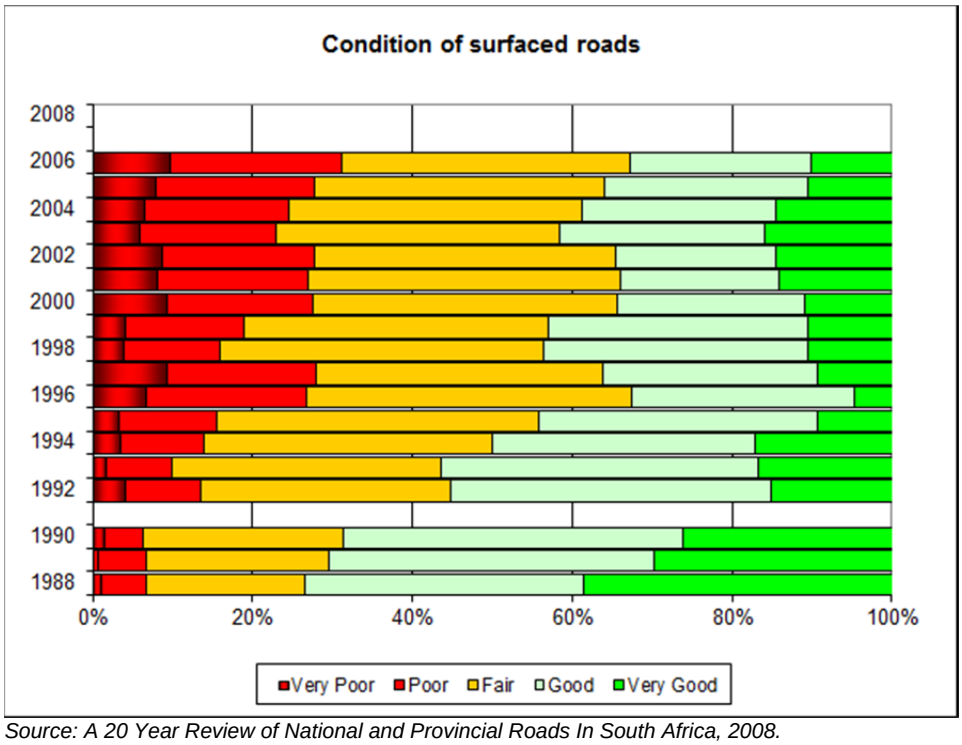


Source: Adapted from 2011 CTO yearbook

Road Conditions in the province is indicated in **Figure 11.3** is of utmost importance in the road freight industry given the impact on maintenance and repair costs, which adds unnecessary costs to the company, the consumer as well as to the cost of logistics in the province and the country.

The CSIR (2009) estimates that a change in road condition from good to bad could bring about an increase of 120.94% in the maintenance and repair cost of a hauler, resulting in an increase of almost 10% (9.97%) in logistics costs.

Figure 11.3 - Road Conditions in Gauteng Province

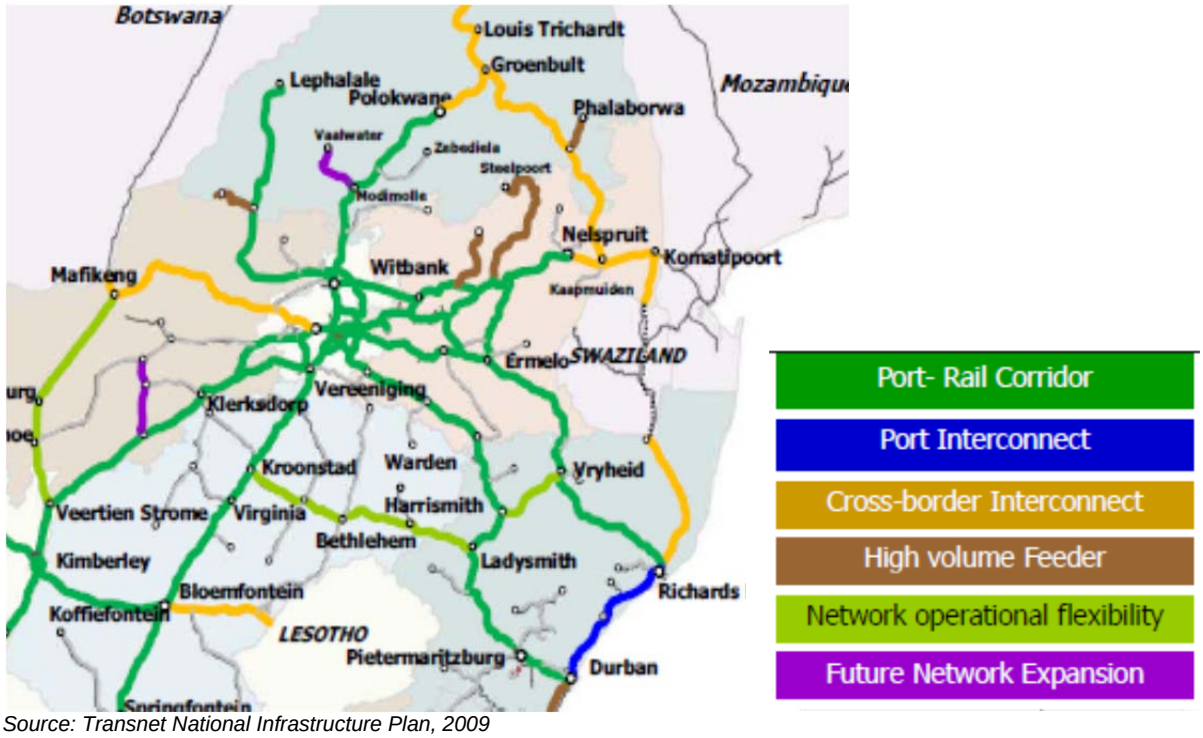


Source: A 20 Year Review of National and Provincial Roads In South Africa, 2008.

11.2.3 Rail Freight

Figure 11.4 shows the relative importance of rail freight from a Gauteng perspective. The figure reflects the core lines only.

Figure 11.4: Importance of Gauteng within Core Line Network



Source: Transnet National Infrastructure Plan, 2009

Figure 11.4 shows that most of the freight movements on the Gauteng core rail line network are focused on the port-rail (NATCOR) corridor.

11.2.4 Air Freight

OR Tambo airport is the largest airport in Gauteng and handles most of the airfreight in the South African economy with levels of about 350,000 tons p.a (NATMAP). The current desire freight lines or corridors that move airport traffic come through a number of roads. Key roads that generally carry airport destined cargo are currently dependant on the major freeway network, like the:

- R21;
- R24;
- N12; and
- N3.

Other routes that form part of the core road network that support freight movement to ORTIA, must be taken into account when looking at freight movement. Generally cargo comes from all over South Africa and gets consolidated/deconsolidate primarily at Isando, Sebenza, Jet Park, Pomona, etc. and the corridors might not be obvious but have an impact on traffic movement that ultimately gets to the airport. Access to the airfreight terminal is through the R21 via Voortrekker Road and at present this access is inadequate as it mixes with traffic that passes through on to the N3 to Durban or any other hub.

11.2.5 Pipelines

The transportation of liquids by pipeline is a major transportation undertaking in Gauteng. There are two main pipelines that supply the interior, via Gauteng:

- The Refined Products Pipeline, a 300 mm line from Durban to Sasolburg (Coalbrook);
- The Crude oil line, a 400 mm pipeline that conveys crude oil from Durban's offshore mooring buoy to the Reef storage and inland refinery.

Pipelines in Gauteng Province emanate from Coalbrook (near Sasolburg) in the Free State and Secunda in Mpumalanga. The pipeline from Coalbrook has road and rail off-take points in Gauteng at Alrode, Langlaagte, Tarlton, Rustenburg, Pretoria West, Waltloo and Benoni. An additional line from Secunda joins this pipeline to the south of Johannesburg and also intersects with a second pipeline from Coalbrook to Witbank, which also passes through

Gauteng. Approximately 3.6 billion litres of refined fuel is transported through Gauteng to various delivery points.

A third pipeline from Coalbrook supplies aviation fuel directly to Johannesburg International Airport. In 2006/07, this line transported 1.15 billion litres which equates to approximately 866 000 tonnes. Products transported include, gas, aviation turbine fuel, crude oil, diesel, alcohol, and various grades of petrol. The pipelines from the coast currently move approximately 8,7 billion litres of refined products and crude oil per annum. The refined products line had the potential for expanding up until about the year 2007 whereas the crude oil line was already running at near capacity in 2005.

The presence of the pipelines in the province constitutes a major transportation asset, as the large volumes transported that would otherwise be moved by rail where possible, or by road, thereby increasing road usage and congestion. The location of the pipelines is shown in **Figure 11.5**.

Figure 11.5 - Location of Pipelines

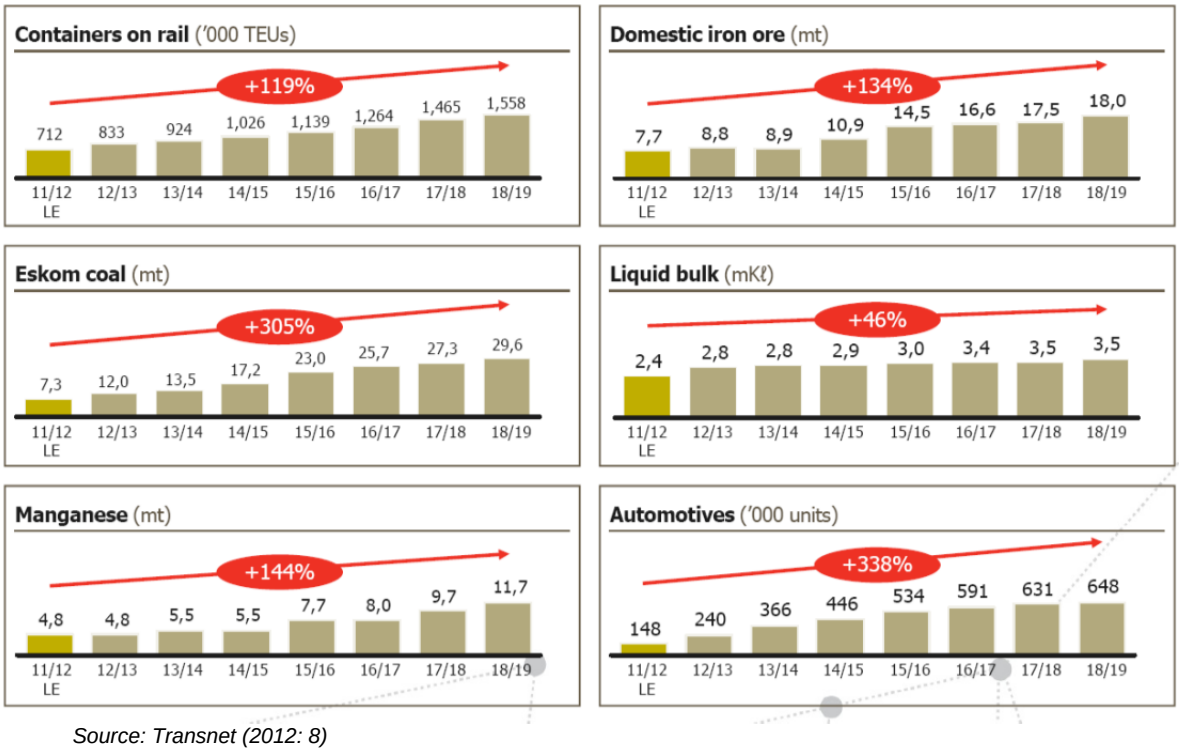
Source: National Transport Master Plan

11.3 Transport Trends

One of the biggest freight transport trends is related to the expected modal shift from road to rail. According to Transnet (2012) their Market Demand Strategy a strong growth in general freight is expected for the rail industry (refer to **Figure 11.6**).

Figure 11.6 indicates significant growth in various commodities which influences rail infrastructure requirements. The expected growth in containers and automotive demand will have a direct impact on the road and rail system in Gauteng. Fuel will largely move from long distance haulage to distribution from consolidation points. This growth will directly influence Gauteng due to the national linkages of the rail network.

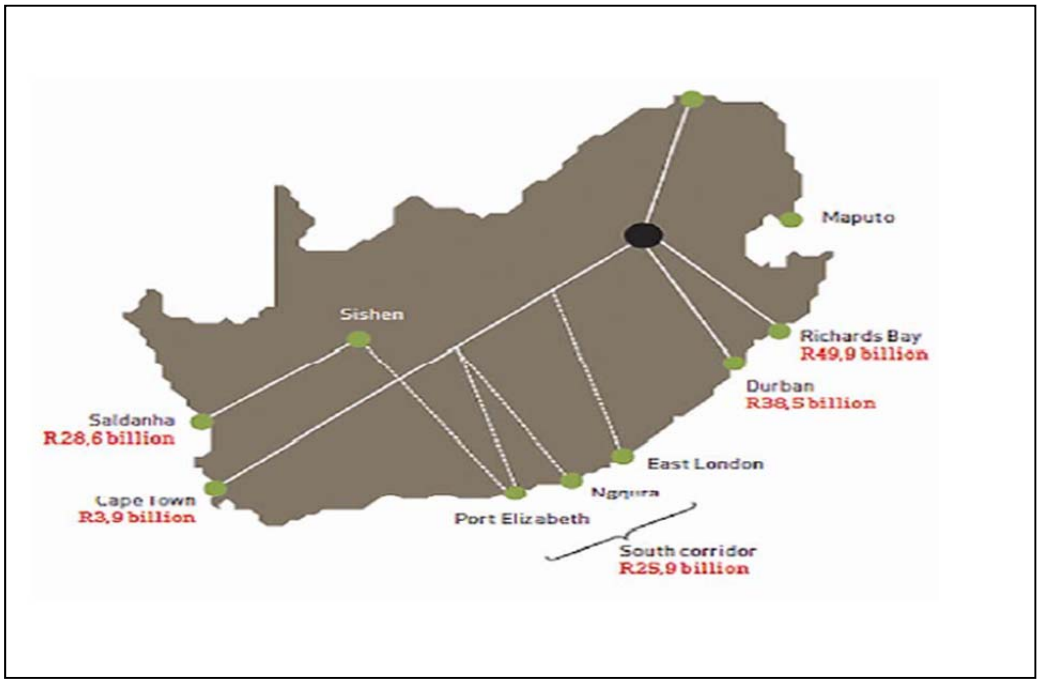
Figure 11.6 - Expected Growth in Rail freight (2011 to 2019)



Source: Transnet (2012: 8)

Figure 11.7 indicates that the R38.5bn will be invested on the corridor between Gauteng and Durban to enable Transnet to transport the increase in import and export containers.

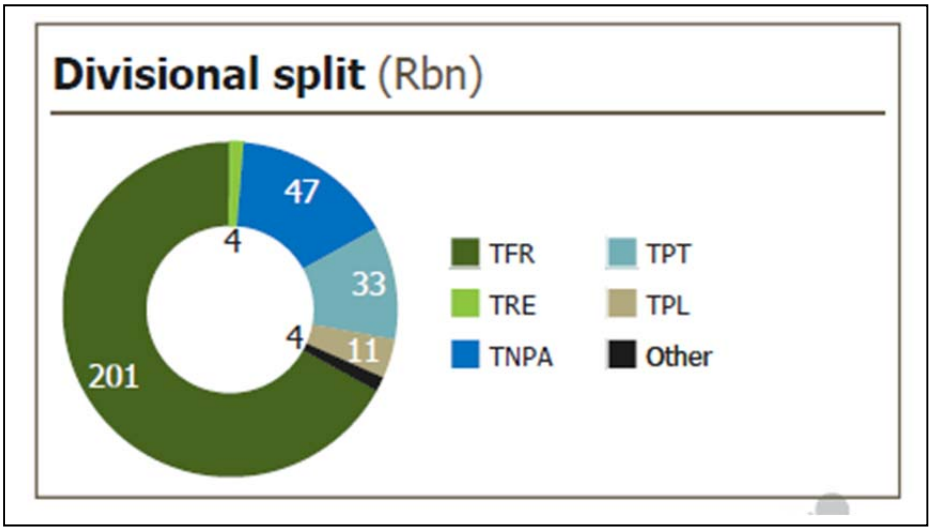
Figure 11.7: Transnet 7 year Capital Investment by Region



Source: Transnet (2012: 15)

Figure 11.8 indicates that the largest component of the future Transnet investment is directed at rail infrastructure.

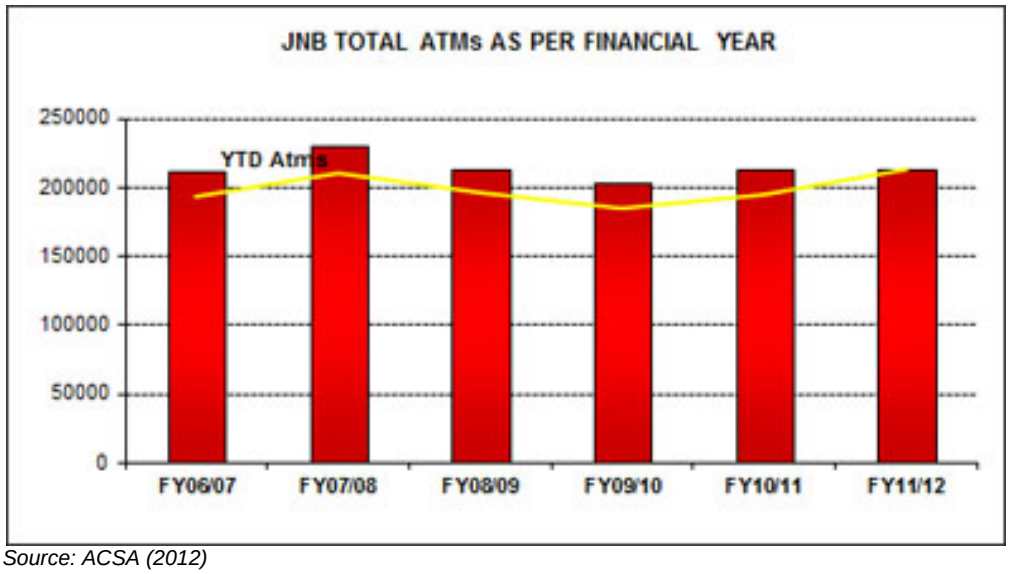
Figure 11.8 - Investment in Transnet Freight Rail (2011 to 2019)



Source: Transnet (2012: 6)

Air freight volumes are not expected to show significant increases in the short term. **Figure 11.9** depicts the relative constant aircraft movements at OR Tambo International Airport. The bulk of air cargo is belly freight of passenger planes and as such it is deduced that growth rates will be relatively low.

Figure 11.9 - Aircraft Movement Statistics per financial Year for OR Tambo International



Source: ACSA (2012)

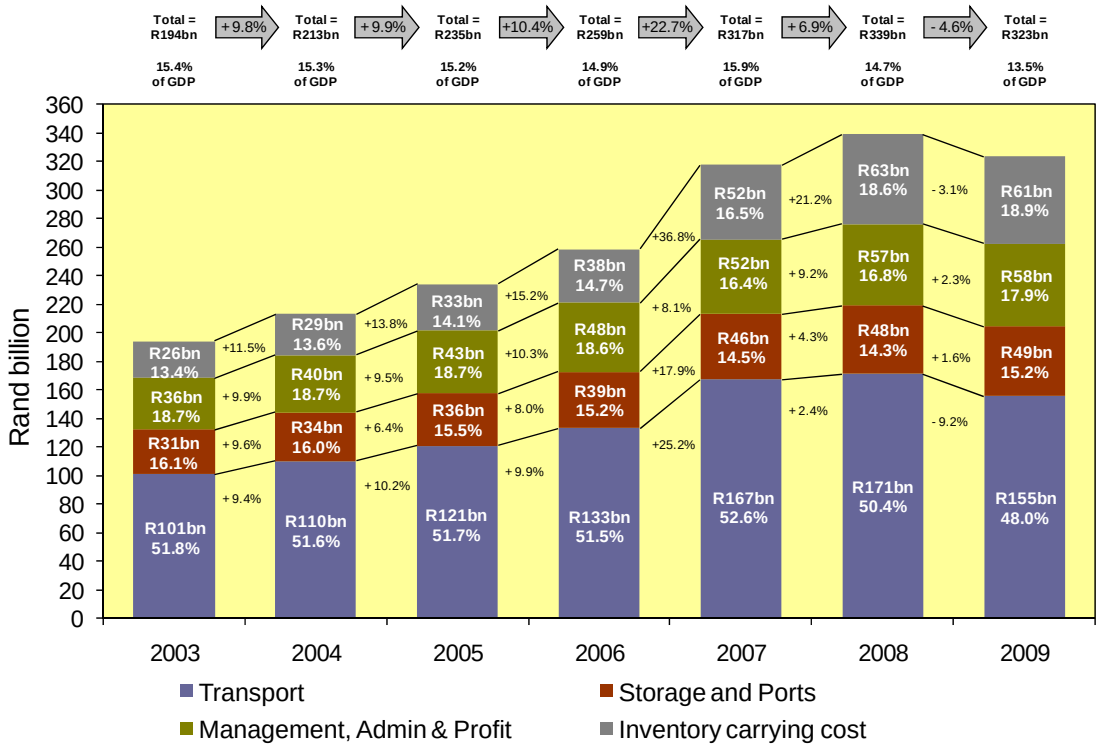
11.4 Logistics Costs

The State of Logistics survey was initiated which endeavoured to, inter alia, calculate the costs of logistics at a national level as a percentage of GDP. **Figure 11.10** reflects the logistics costs for South Africa for the period 2003 to 2009[1]. The cost of logistics is calculated and presented as a percentage of GDP. In 2009 the percentage was 13.5% which is the lowest of this period while the highest percentage was in 2007 when the fuel price was very high and contributed significantly to this high percentage.

Four logistics components are used to calculate these costs namely transportation costs, storage and ports costs, inventory carrying costs as well as management, admin and profit. The latter component is in fact a derivative. The transportation costs are clearly the largest component contributing to the country's logistics costs (48% of the logistics cost of 2009). Two of the main reasons for this are, firstly, that the major economic activity in the country takes place in Gauteng which is in the centre of the country implying freight needs to be transported over large distances to the various ports. The internal logistics cost of the country is thus higher than what would normally be expected. In addition most freight is transported on road and over this period, from 2003 to 2009, the growth in freight has been mainly on road.

[1] CSIR, 2010. 7th State of Logistics survey.

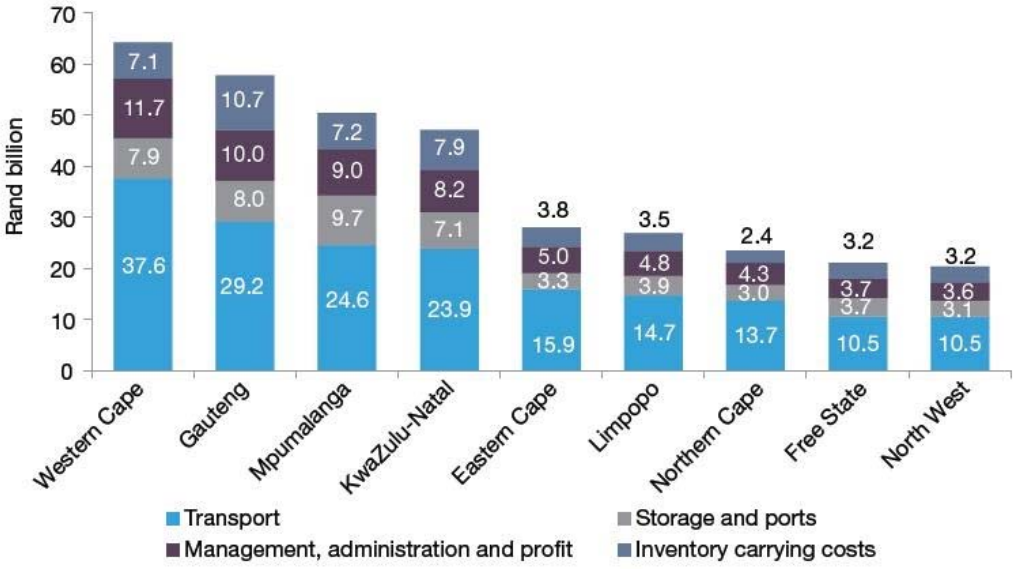
Figure 11.10 - Logistics Costs of South Africa



Source: CSIR (2010)

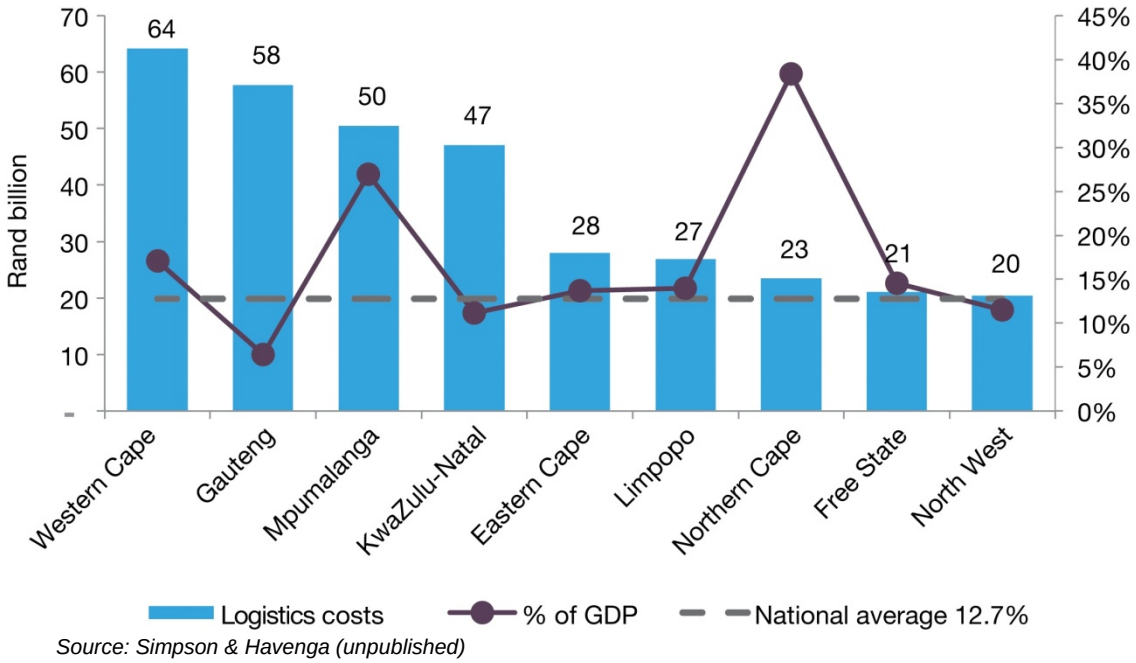
In a recent unpublished study (Simpson and Havenga, unpublished) the logistics costs per province were analysed and is indicated in **Figures 11.11 and Figure 11.12**.

Figure 11.11 - Logistics Costs per Province Broken Down into Cost Components



Source: Simpson & Havenga (unpublished)

Figure 11.12 - Logistics Costs as a Percentage of Provincial GDP



Source: Simpson & Havenga (unpublished)

It is deduced that although Gauteng has the second highest logistics cost, the logistics cost as percentage of provincial GDP is the lowest of all the provinces. According to Simpson and Havenga (unpublished) this is ascribed to the lower relative transport costs and a more mature tertiary sector. Gauteng does, however, have the highest inventory carrying cost.

11.5 Overloading in Gauteng

11.5.1 Introduction

Gauteng is essentially the hub of economic activity in South Africa and a large percentage of road freight enters and leaves the province. Because of the nature of the road network in Gauteng, there are numerous alternative routes. Overload control in most cases therefore have to take place on an area as well as a corridor basis. Although particular routes and corridors could be identified as the major heavy vehicle routes in Gauteng, heavy vehicle traffic patterns would change substantially as soon as overload control was implemented on certain routes.

Experience has shown that overload control on a single route is largely ineffective unless alternative routes are monitored as well. Typically, when a weighing exercise commences heavy truck drivers, with the aid of long distance radios and cellular phones, select alternative routes. This is done in order to avoid the operational weighbridge and implications associate therewith. In Gauteng, it is especially difficult to control all possible routes because of the large number of available routes in the province.

An analysis of fifteen years of overload data (1995 to 2009) has shown that approximately 18% of all vehicles weighed at static weighbridges in South Africa were overloaded, while approximately 4% was overloaded beyond the prosecution tolerances. The data for Gauteng shows similar percentages.

2011 data from the Heidelberg TCC shows that approximately 27% of the vehicles weighed at this TCC were overloaded, while approximately 5% was overloaded beyond the prosecution tolerances. The average overload per overloaded vehicle was approximately 640kg.

Weigh-in-Motion (WIM) data for six HSWIM sites on provincial roads in Gauteng for the period 2005 to 2008 showed a large variation in the percentage of overloaded heavy vehicles. The highest extent of overloading occurred on the R573 (Moloto Road, north-east of Pretoria), with approximately 30% of heavy vehicles overloaded in the north-bound direction and 15% in the south-bound direction, based on the data for the third quarter in 2008. The R25 south-bound, which links Bronkhorstspruit with the East Rand, is another road with a high extent of overloading of approximately 17 %, based on data for the third quarter of 2008.

11.5.2 Existing Weighbridges

There are currently 19 weighbridges in Gauteng. Two of these are operated by SANRAL, four are provincial weighbridges, twelve are municipal weighbridges and one is a private weighbridge.

The two weighbridges operated by SANRAL, namely the Heidelberg TCC on the N3 and the Donkerhoek TCC on the N4 are operated on a continuous basis. In excess of 150 000 vehicles are weighed at the Heidelberg TCC per annum, while in excess of 50 000 vehicles are weighed at the Donkerhoek TCC per annum.

The four provincial weighbridges are operated on an ad-hoc basis. Three of these were computerised in 2010, but very little weighing is currently taking place. The fourth provincial weighbridge is located at the Boekenhoutkloof Traffic Training College and is mostly used for training purposes.

The municipal weighbridges are all located at vehicle testing stations and are mostly used for tare weighing for vehicle registration purposes, although most of them could be used for law enforcement purposes as well.

The private weighbridge is located just off the N1 at the Wallmansthal interchange north of Pretoria. This weighbridge is utilised by both provincial and metropolitan (Tshwane) traffic officers for overload law enforcement.

11.5.3 Gauteng Overload Control Strategy

An overload control strategy was prepared for the Gauteng Department of Transport and Public Works by the CSIR in 2000 and was updated in 2003. In this strategy seven major corridors for the movement of heavy vehicles were identified as indicated in **Table 11.4**. At the stage that the strategy was prepared, the nineteen current weighbridges were all in existence.

Table 11.4 - Gauteng Major Corridors for the Movement of Heavy Vehicles

Routes	Locations
N3/R23	Johannesburg – Durban
N4/N12	Pretoria/East Rand/Jhb – Nelspruit/Maputo
N1/R103	Pretoria/Johannesburg – Pietersburg/Beitbridge
N4/R514	Pretoria/Johannesburg – Rustenburg/Botswana
N12/N14/R501	Johannesburg – Potchefstroom/Kimberley/Namibia
N1/R59	Johannesburg – Bloemfontein/Cape Town

11.5.4 Proposed overload control on the GFIP road network

A number of the weighbridges proposed in the Gauteng Overload Control Strategy are located on national routes now forming part of the GFIP. An investigation into overload control on the GFIP was undertaken on behalf of SANRAL. As part of this investigation, the conventional approach to inter-city overload control, with static weighbridges at strategically located TCCs was considered. Five different TCC options were investigated for the GFIP road network, but none of them was economically viable. This is mainly due to the many “escape routes” within the GFIP area, relatively short travel distances of less than 200km, the scarcity of available land and the high capital and operational costs.

An alternative approach, known as “Virtual Weigh Stations” (VWS) was also investigated and it was proposed as a more appropriate solution for overload control on the GFIP road network. A VMS is a weigh-in-motion system that provides vehicle records for enforcement, traffic surveillance and/or data collection in real time and provides a way to unobtrusively monitor heavy vehicle traffic. The system automatically weighs vehicles as they travel at normal speeds along a roadway, classifies them based on weight and axle spacing and determines when vehicles are in violation of regulations.

The driver of such a vehicle can then be instructed to exit the freeway at the next safe location (technical shelters with access from the freeway). The vehicle will then be weighed on a mobile scale and, if found to be overloaded, directed to the nearest static weighbridge. A number of these technical shelters have been provided on the GFIP road network.

11.6 Freight Transport and Logistics Problem Areas

This section focuses only on the problem areas directly related to freight transport and logistics. General transport problems that also affect freight transportation, such as congestion, are not discussed in this section. Problem areas include:

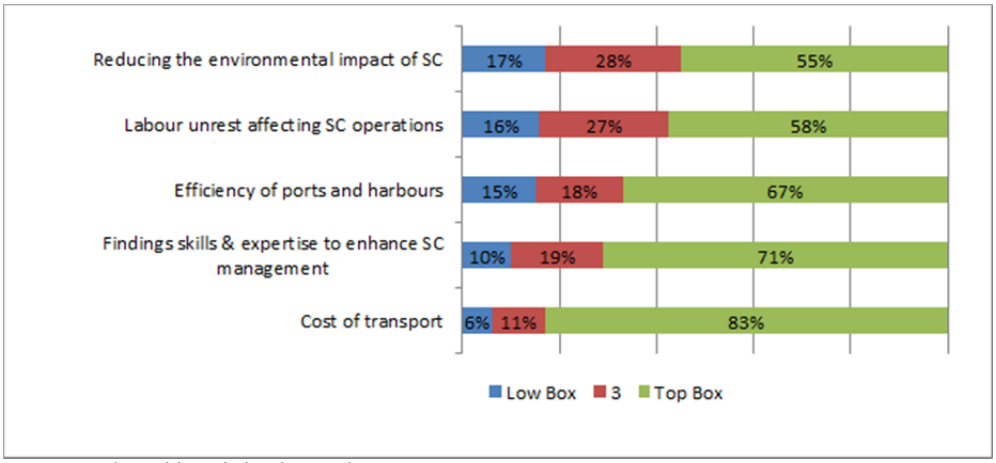
- Supply chain constraints
- Overloading
- Infrastructure requirements.

11.6.1 Supply Chain Constraints

The Supply chain foresight 2012 (Barloworld Logistics: 2012) identified the top five constraints to supply chain as experienced by industry and is indicated in **Figure 11.13**.

It is evident that the cost of transport features as the greatest supply chain constraint, while the efficiency of ports and harbours also serves as a significant constraint. Although these constraints apply to the country as a whole the significant role of the Gauteng economy implies that these factors are highly applicable to Gauteng.

Figure 11.13 - Top 5 Constraints to Supply Chain



Source: Barloworld Logistics (2012:6)

11.6.2 Overload Control

The main problem with overload control in Gauteng is the underutilization of existing weighbridges. Although not ideally located, the existing provincial and municipal weighbridges give reasonable cover of the road network in the province. However, these weighbridges are not fully utilised to do overload control on a regular basis. The municipal weighbridges in particular are not being used for overload control. The verification of the scales, which has to be done every six months, is also problematic. If the verification is not done at the required interval, the weighbridge cannot be used for overload law enforcement. Equipment breakdown can also result in weighbridges not being operational for lengthy periods, mainly as a result of the government procurement process.

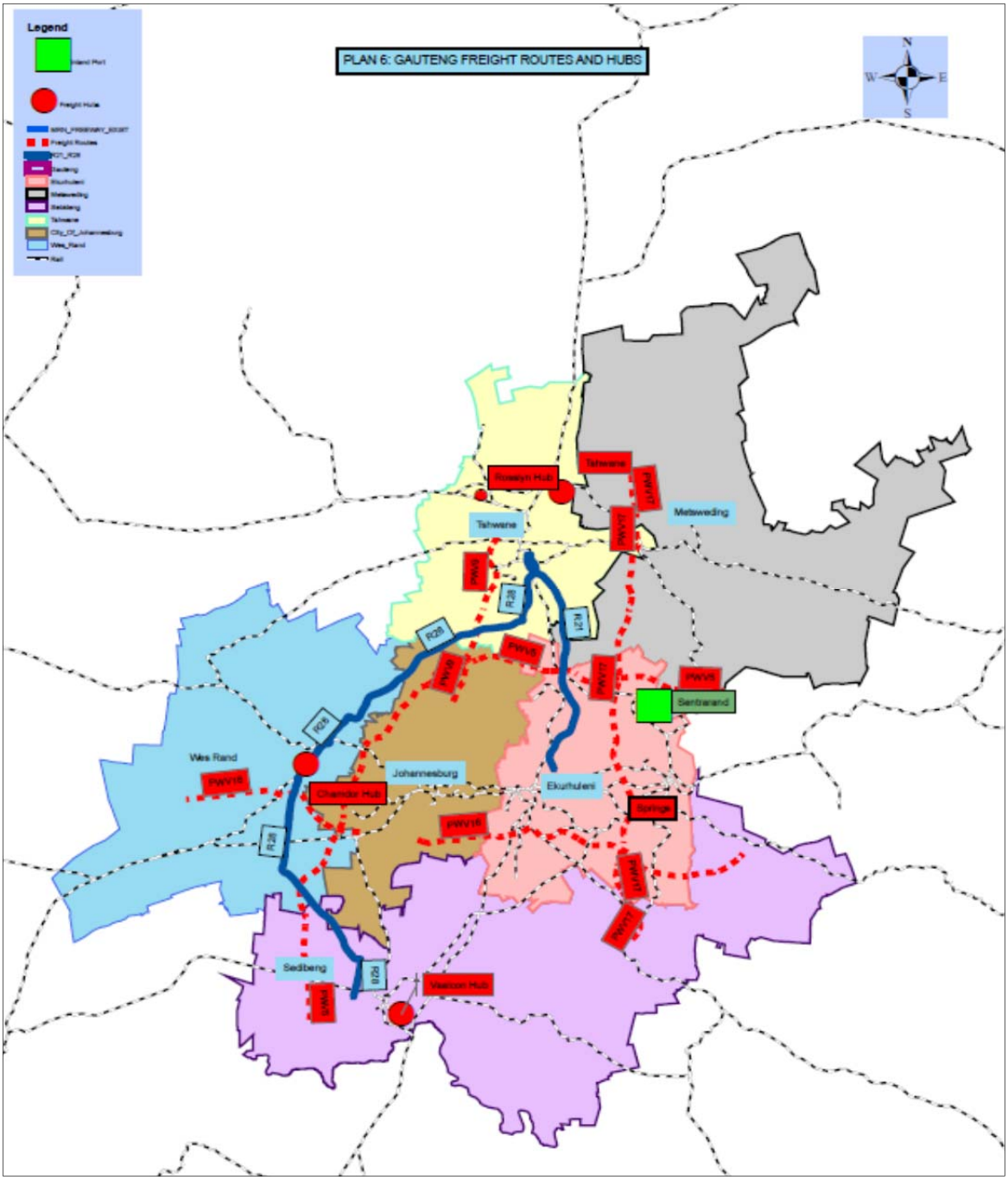
Another challenge in Gauteng is the large number of available routes in the province, making it especially difficult to control all possible routes with conventional static weighbridges and alternatives should be investigated, such as the concept of Virtual Weigh Stations being implemented on the GFIP road network. This could also address the other problem with conventional static weighbridges, namely the high capital and operating costs.

The above problems are futher exacerbated by the fact that the last update of the Gauteng Overload Control Strategy was done in 2003 and the whole strategy needs to be reviewed. During such a review it would be of utmost importance that the proposed overload control on the GFIP road network be taken into consideration as this would have a major impact on the number and position of the static weighbridges and the WIM sites that would be required to adequately control overloading in Gauteng. Alternatives to conventional static weighbridges should be investigated as part of the strategy review.

11.6.3 Logistics Infrastructure Requirements

The Gauteng Freight Implementation Strategy proposed the development of a Strategic Freight Network and Nodes as reflected in **Figure 11.14**.

Figure 11.14 - Proposed Strategic Freight Network and Nodes



Source: Gauteng Freight Implementation Strategy, 2005

According to a study commissioned by Blue IQ (2010) which prioritised freight projects it was found that certain logistics hubs require further investigation due to their relative importance for Gauteng, namely:

- Sentrarand Logistics Hub,
- OR Tambo Logistics Hub (existing),
- Chamdor Logistics Hub (new),
- City Deep (existing),
- Tamboekiesfontein (new) or Tambo Springs (new), and
- Tshwane Hub (new)

In addition it was found that certain road freight routes also required further investigation, namely:

- Road PWV 17
- Road PWV 5
- Road PWV 18

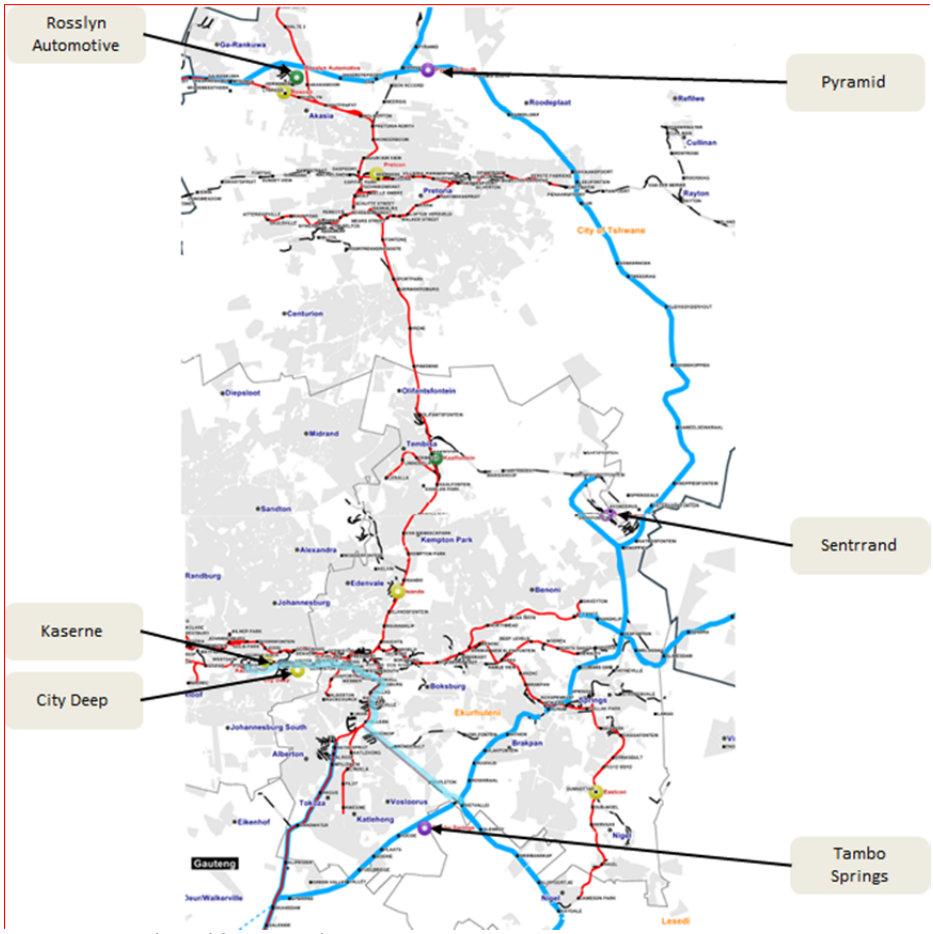
This infrastructure is very expensive but the above study found that a 22,5% reduction in congestion caused by freight vehicles may be achieved by developing the entire logistics network.

In its National Infrastructure Plan Transnet proposes the development of the Gauteng Freight ring as well as a number of logistics hubs which are shown in **Figure 11.15**.

The blue line represents the ring rail while the red lines represent the commuter lines.

City Deep, an import and export container facility, operates close to capacity (±225 000 TEU's in 2010) and due to its old infrastructure needs to be upgraded before a significant improvement in capacity can be achieved. Kaserne handles currently local container traffic but provides the opportunity of constructing a new terminal on the vacant land, but, due to the road and rail limitations as well as the associated industrial development around such a terminal the maximum number of containers which can be handled are limited to approximately one million TEU's per annum. This constraint will accelerate the development of freight intermodal facilities outside the CBD (i.e. Tambo Springs, Sentrarand and Pyramid).

Figure 11.15 - Gauteng Freight ring and Freight Hubs (TFR perspective)



Source: Adapted from Google

11.7 Planned Infrastructure

Certain logistics infrastructure projects are being planned for Gauteng. These projects include:

- Logistics hubs
- Weighbridges
- Rail infrastructure
- Air cargo infrastructure.

Current logistics hubs being considered for Gauteng include:

- West Rand Logistics Hub
- Tambo Springs Hub
- Vaal Logistics Hub
- Tshwane Intermodal Freight Hub.

11.7.1 West Rand Logistics Hub

Blue IQ Investment Holdings (Pty) Ltd conducted a feasibility study pertaining to the establishment of a logistics hub and related freight infrastructure in the jurisdiction of the West Rand District Municipality (WRDM) of Gauteng, South Africa. This study was a joint project by the Blue IQ, Gauteng Department of Roads and Transport, West Rand District Municipality and the Development Bank of Southern Africa (DBSA).

The West Rand Logistics Hub will be an intermodal (road and rail) logistics hub with a focus on general freight as well as containers. It is proposed to establish an Industrial Development Zone (IDZ) with the aim to support industrial development around the hub. Phase 1 of the development will be road based only, while phase 2 will provide a rail linkage to the facility. Facilities will include warehousing, truck stop and administration offices.

The principle objective of the study was to assess the feasibility of the development of a logistics hub in the West Rand.

Although the feasibility study was completed, project implementation is currently delayed. This is due to the fact that the selected site could not be obtained from the landowner concerned. There is a current initiative underway to identify an appropriate site which is owned by Government.

11.7.2 Tambo Springs Hub

The Tambo Springs Hub is a private initiative to establish a logistic hub close to the petrol port north of Heidelburg. The objective of the project is to provide an intermodal facility with warehousing for the Gauteng South region and to promote regional economic development. Project buy-in from relevant stakeholders, such as Government institutions, Transnet and business, are required prior to the commissioning of feasibility studies.

Various pre-feasibility studies have been concluded including land use planning/ town planning.

11.7.3 Vaal Logistics Hub

The Vaal Logistics Hub (VLH) is an initiative by the Sedibeng District Municipality, The Emfuleni Local Municipality and the North-West University. The VLH is an intermodal hub (road, rail and air) that will consist of a container depot, an IDZ, and an international airport. The objective of the project is to lower inland transport costs and to promote regional economic development. Project buy-in from relevant stakeholders, such as Transnet and business, are required prior to the commissioning of feasibility studies.

Relevant stakeholders (business, local government and academic institutions) are currently considering signing a memorandum of understanding.

11.7.4 Tshwane Intermodal Freight Hub

The area earmarked by the City of Tshwane can be developed as an intermodal freight hub with road and rail linkages; and an airport. The hub will be an intermodal hub that includes road, rail and also air modes of transport.

The freight hub has the objective to serve as a regional freight logistics hub for the Southern African region[2]. Land ownership remains one of the major issues. The project is intended to be implemented in three phases, namely:

- Inception phase – Land acquisition and civil works.
- Phase 1 – Truck stop, container terminal, aviation and warehousing.
- Phase 2 – Second phase of warehousing.

[2] Presentation by T Nkoana at Blue Logistics Infrastructure Workshop on 28 October 2009.

11.7.5 Weighbridges

The Gauteng Overload Control Strategy proposed the following thirteen additional weighbridges as reflected in **Table 11.5**.

Table 11.5 - Proposed New Weighbridges for Gauteng

Weighbridge	Route on and additional routes/roads covered
Meredale	N1; M1; R553; R82
Benoni	N12; R23
Kliprivier	R59; R550; D1073
Tembisa	R21; M57; K27; P38/1
Akasia/Rosslyn	R566; R80
Kempton Park	M39; R25; D1511
Vanderbijlpark	N1; R553; R54; R28; R57
Westonaria	N12; R28
Bronkhorstspruit	N4; K175; R25
Eikenhof	R82; R550; D405
Randfontein	R28; D93
Carletonville	R559; D92; R501
Devon	N17; R29; R550; P36/3

None of these proposed weighbridges has been established to date. The Gauteng Overload Control Strategy also recommended that twenty-five HSWIM sites are required to provide an adequate indication of overloading trends in the Province. Currently there are seven permanent SANRAL HSWIM sites in Gauteng and six provincial HSWIM sites.

Additional HSWIM sites proposed in the strategy that have not been established yet are reflected in **Table 11.6**

Table 11.6 - Proposed New HSWIM Sites for Gauteng

Route	Description
R23	Benoni
R59	Kliprivier
R101	Bon Accord
M39	near Chloorkop
M1	Houghton
M2	Benrose
R553	Golden Highway
R42	Heidelberg to Nigel
N14	P126-1
N14	P158-2
R82	South of Eikenhof
R51	Bapsfontein
N4	West
P89-1	Carletonville
N14	West

11.7.6 Rail Infrastructure

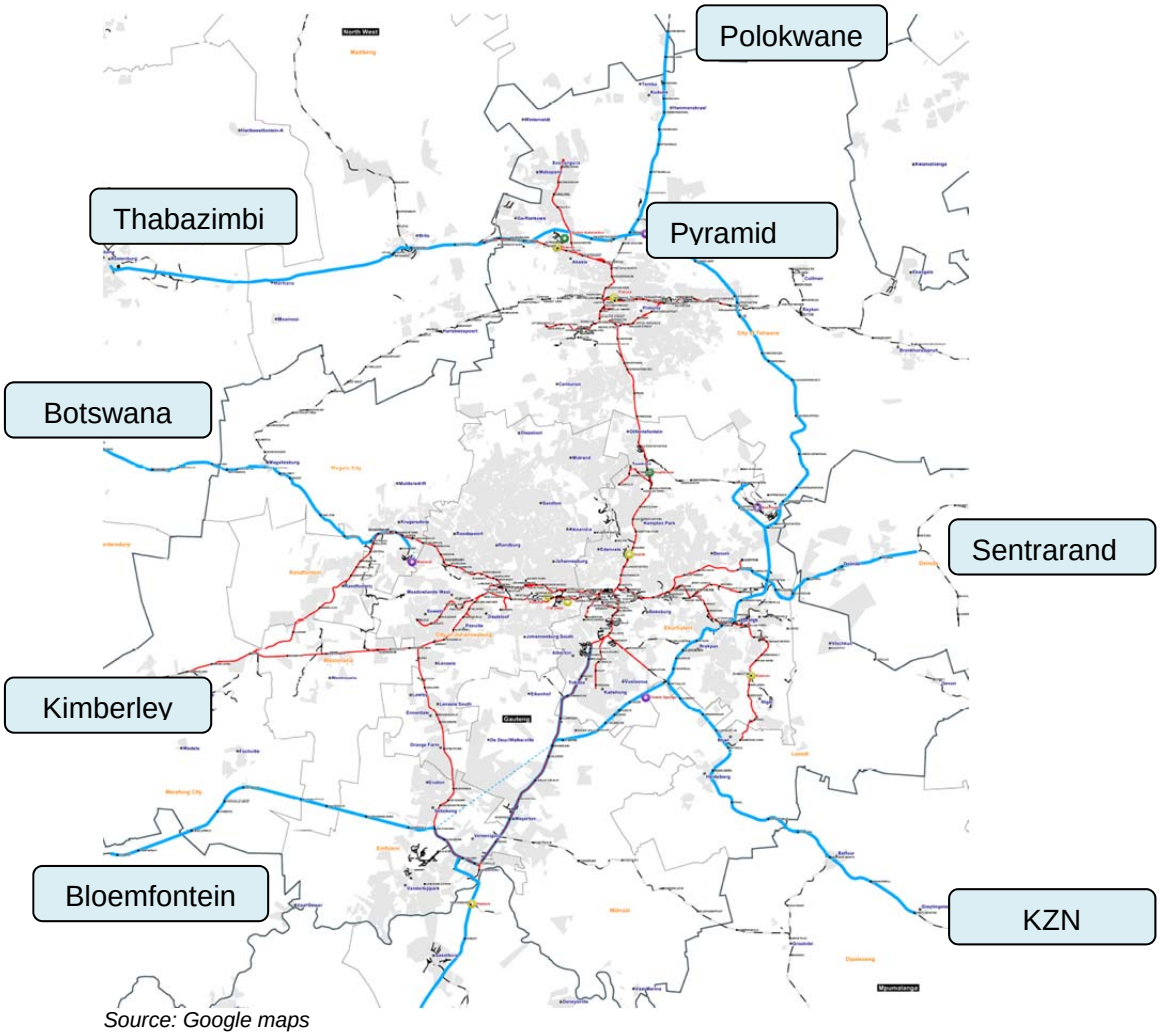
According to Transnet (2009) Gauteng is the centre of most regional and port connections in South Africa. Due to complex flows and limited bypass routes the need for a freight ring was identified. Transnet stated (2009) that a freight ring has the potential to:

- Facilitate uninterrupted flow of freight
- Provide a key link between hubs and terminals
- Provide dedicated freight routes segregated from PRASA routes.

Figure 11.16 indicates the Gauteng Freight ring (Blue lines). The red lines indicate the commuter lines. The Gauteng freight ring will separate freight and commuter activities to a large extent. The rail ring enters the Province from Durban and stretches from Vereeniging in the south through Pyramid in the north and then westwards towards Thabazimbi in the west. This ring is connected to Sentrarand and Pyramid South which are existing marshalling yards. The rail ring is also connected to City Deep, the current import and export container facility

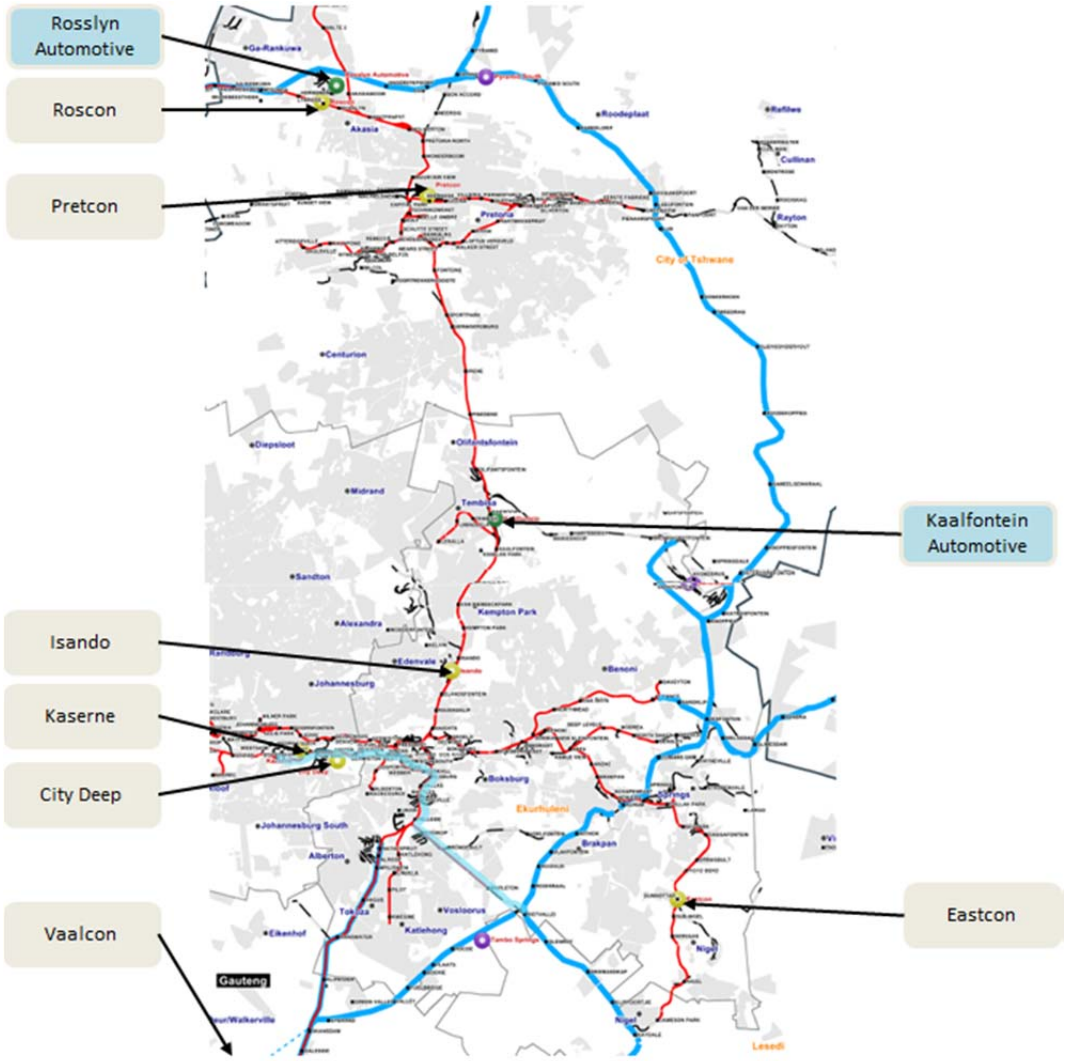
The proposed Gauteng intermodal terminals which are indicated in red will provide sufficient terminal capacity up to 2050. The phasing of these terminals is subject to demand and the supply to final destinations. **Figure 11.17** gives an indication of the existing container terminals in Gauteng. These terminals are constrained by inadequate equipment, infrastructure and road access. Some of these terminals could be phased out in the near future and their existence will be determined on either demand and/or activities in and around the immediate precincts surrounding the terminals.

Figure 11.16 - Gauteng Rail Ring



Source: Google maps

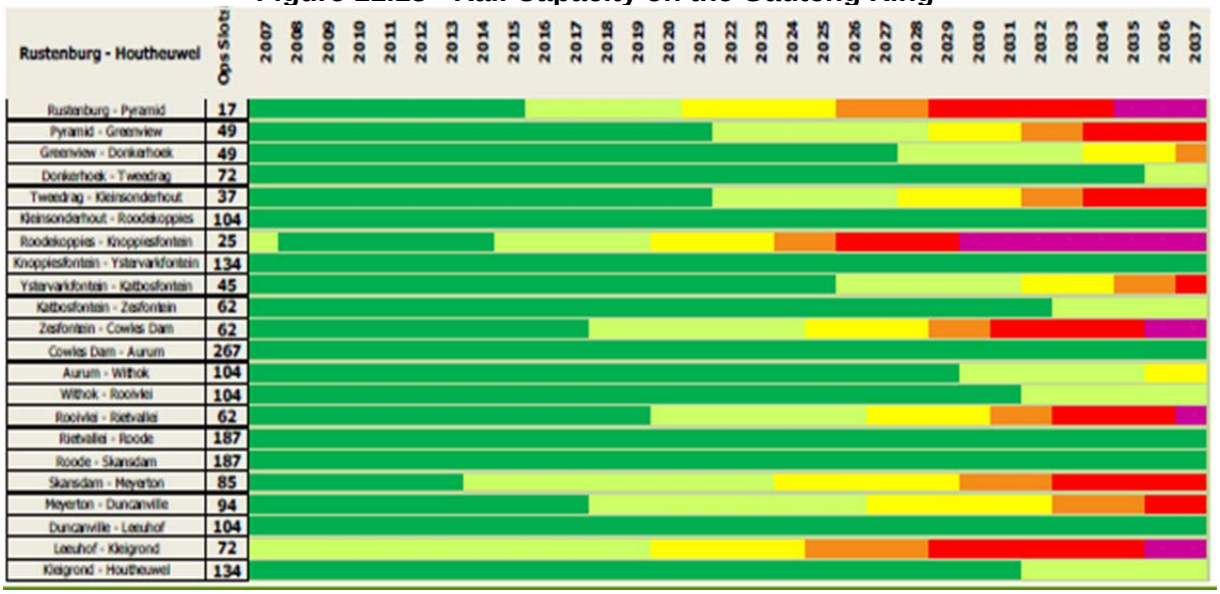
Figure 11.17 - Existing Gauteng Terminals



In **Figure 11.17** the blue areas represent the automotive terminals.

Figure 11.18 depicts the available rail capacity on the Gauteng ring. This capacity is subject to Transnet take-up of market share and Transnet growth strategy as illustrated in **Figure 11.18**.

Figure 11.18 - Rail Capacity on the Gauteng Ring



Source: Transnet NIP 2007

Based on the capacity analysis as indicated in **Figure 11.18** the interventions as identified in **Table 11.7** are required to provide sufficient capacity for the planned demand up to 2037.

Table 11.7 - Intervention on rail infrastructure

Location	Intervention	Needed by
Pendoring to Rustenburg	Double existing single track sections, 25kV and CTC	2027
Pyramid South to Wildebeeshoek	Double existing single track sections, 25kV and CTC	2027
Freight Ring to Maputo Corridor)	New single track chord from South to East	2015
Baviaanspoort to Leeufontein	Double existing single track sections, 3kV and CTC	2032
Tweedracht to Kleinzonderhout	Double existing single track sections, 3kV and CTC	2033
Roodekoppies to Knoppiesfontein	Double existing single track sections, 3kV and CTC	2025
Ystervarkfontein to Katbosfontein	Double existing single track sections, 3kV and CTC	2036
Zestfontein to Cowles Dam	Signal infill scheme to reduce headway to 8mins	2027
Aurum - Rooivlei	Signal infill scheme to reduce headway to 8mins	2037
Rooivlei - Rietvallei	Signal infill scheme to reduce headway to 8mins	2027
Houtheuwel to Skansdam	New double track 3kV DC, CTC signalling	2029

Source: Transnet NIP 2007

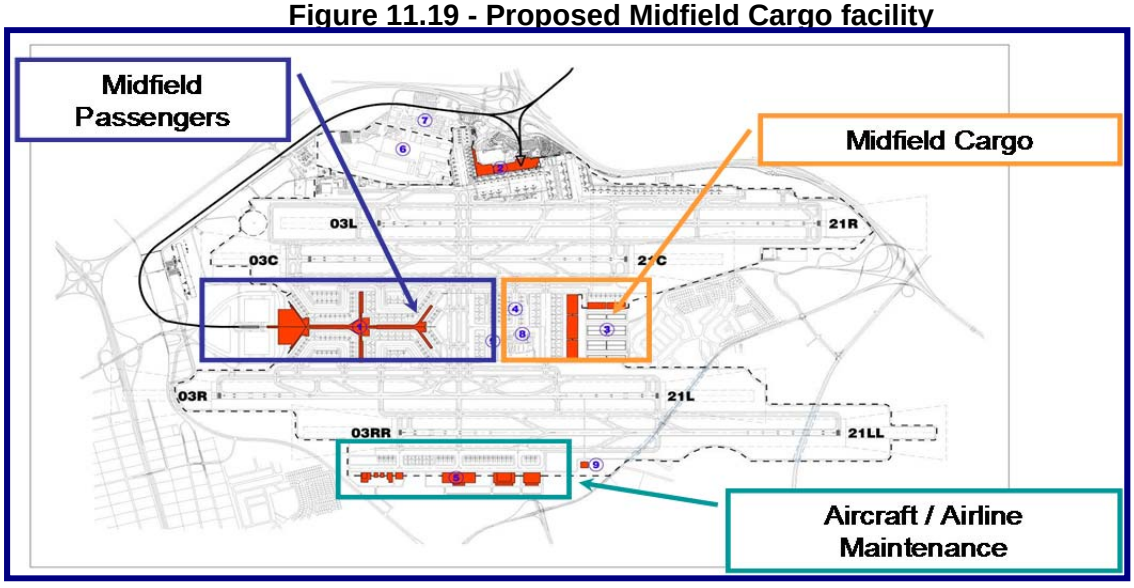
The intervention as indicated in **Table 11.7** can be accelerated depending on market demand and supply. It is important that capacity is provided in time to support market growth and stimulation.

11.7.7 Air Cargo Infrastructure

Although the Tshwane Intermodal Freight Hub and the Vaal Logistics Hub are proposed air cargo hubs for Gauteng, the most significant air cargo operations remain at O.R. Tambo International Airport. Cargo operations at O.R. Tambo International have grown significantly over the last 40 years and air freight has reached such volumes that the airport is looking to establish a new cargo hub. Dubbed 'Midfield Cargo', the new facility will be located between the two runways and is viewed as a long-term solution to current and future capacity demand, as discussed in the airport's master plan. With O.R. Tambo handling some 300,000 tonnes of cargo in 2009 airport planners are looking to create new synergies in the handling of logistics and the new facility will allow the gateway to handle 1 million tonnes of cargo annually.

As per the national intention of consolidating ORTIA as the preferred hub for the region, the airport masterplan calls for the consolidation of all air freight activity in a cargo terminal in the so-called Midfield Terminal as indicated in **Figure 11.19**.

Figure 11.19 - Proposed Midfield Cargo facility



Source: ACSA 2006. O.R. Tambo International Airport Integration Report, Third Draft

An air freight study commissioned by ACSA has indicated the upward potential and confirmed the benefits of ultimately consolidating air cargo in this way. By being in the Midfield, a much better orientation, size and general layout for future cargo can be obtained. Such terminal would also be located centrally in the airport, thereby serving both the existing passenger terminal precinct as well as the future midfield passenger terminal. At the same time, the existing cargo precinct could see re-investment in general airport-related commercial developments that integrate with Ekurhuleni's ideas for Rhodesfield, to the west of the R21.

12 ROAD NETWORK PLANNING

12.1 Investing in Infrastructure

The Government's "New Growth Path" outlines an approach to accelerate growth and employment, focusing on job-creation targets and sector-based actions that will help to achieve them. Jobs drivers are identified as:

- Continuing public investment in infrastructure, creating employment directly in construction, operation, maintenance and the production of inputs, and indirectly by improving efficiency across the economy.
- Targeting more labour-absorbing activities in the agricultural and mining value chains, manufacturing, construction and services.
- Promoting innovation through "green economy" initiatives.
- Supporting rural development and regional integration.

Government believes that prudent macroeconomic policy that takes into account global volatility and the need to sustain growth will support the New Growth Path. While many countries are tightening their fiscal belts, it is thought that South Africa's macroeconomic approach affords government the space to grow expenditure at a moderate pace to support social and economic priorities. Public spending in support of social programmes has been strong and, if combined with more rapid job creation, will significantly increase inclusion and income equality.

As shown in **Table 12.1** public-sector spending on infrastructure has increased from 4.6 per cent of GDP in 2006/07 to 9.8 per cent of GDP in 2010/11, and is expected to average 8.4 per cent of GDP over the forecast period, totalling R808.6 billion. Economic services make up 82.1% of infrastructure development over the medium term, of which transport and logistics investment, which covers transport network expansion and upgrades, continues to hover at 25% of the total investment.

Table 12.1 - Public sector infrastructure expenditure and estimates by sector (R Million)

	2010/11	2011/12	2012/13	2013/14	MTEF Total	% of Total
Sector	Revised Estimate	Medium Term estimates				
Economic Services	228 657	216 181	219 380	228 507	664 067	82.1
Energy	102 782	96 500	98 140	96 769	291 409	36.0
Water and sanitation	20 990	26 836	25 367	28 196	80 400	9.9
Transport and logistics	80 530	67 452	69 096	75 554	212 102	26.2
Other economic services	24 356	25 393	26 777	27 987	80 157	9.9
Social services	26 249	29 519	34 932	44 268	108 719	13.4
Health	8 546	10 256	15 114	20 624	45 993	5.7
Education	6 757	9 155	10 092	11 487	30 735	3.8
Community facilities	6 045	6 360	5 873	7 952	20 185	2.5
Other social services	4 902	3 749	3 853	4 205	11 806	1.5
Justice and protection services	3 100	3 322	7 080	10 171	20 573	2.5
Central government administrative and financial services	2 104	3 827	7 946	3 474	15 248	1.9
Total	260 109	252 850	269 337	286 420	808 608	100
Percentage of GDP	9.8 %	8.7 %	8.4 %	8.1 %		

Source: Budget Review 2011

12.2 Principles and Departure Points

It is envisaged that the GDRT develops an Integrated Road Network that, inter alia:

- Underpins and support growth corridors and nodes,
- Creates a hierarchy that provides mobility roads (Class 1 and Class 2) and roads providing accessibility (Class 4 and 5) with Class 3 roads that provided a balance between mobility and accessibility.
- Provides a road network that allows continuity of travel across the province;
- Provides for acceptable levels of service during peak hour travel i.e. LOS D or better;
- Provides for adequate levels of safety;
- Promote environmental sustainability through the modes and technologies deployed on the Network,
- Provides for heavy vehicles, private vehicles and public transport;
- Provides for non-motorised users on the Class 2 to 5 network;
- Provides priority measures for higher occupancy vehicles where appropriate;

- Provides a safe and reliable strategic road network system which would optimize the movement of freight and passengers;
- Manage congestion and focus on the promotion public transport through the efficient and effective use of existing and future freeway road space

12.3 The Gauteng Road Network

The total road network in Gauteng represents about 7.6% of the total South African road network which is about 448000 km excluding local streets. SANRAL is responsible for a road network of 15600 km (2.9%) of the total road network in South Africa and 14% of the surfaced network. The national roads under SANRAL's jurisdiction comprises of both toll and non-toll roads.

The Gauteng Province has a total road network of about 34200 km of which 1.4% is national roads, 14.1% provincial roads and the remainder are local municipal road i.e., 84.5% of the total road network. **Table 12.2** indicates the mix and split of roads in the Province.

Table 12.2 - Approximate extent of road networks in Gauteng

Road Authority	Length (km)	Network Split
National Roads	470	1.4%
Provincial Roads	4 830	14.1%
Local Roads	28 885	84.5%
TOTAL	*34 185*	*100%*

12.4 The Gauteng National Road Network

12.4.1 Background

The national road network in Gauteng, albeit a small percentage of the road network carries large traffic volumes and provides the mobility network and especially freight network for the Gauteng Province The national network is managed by the South African National Roads Agency. SANRAL is an independent, statutory company registered in terms of the Companies Act. The South African government, represented by the Minister of Transport, is the sole shareholder and owner of SANRAL.

SANRAL operates in terms of its founding legislation, The South African National Roads Agency Limited and National Roads Act (Act No. 7, 1998). It is governed by a Board of

eight people, six of whom are appointed by the Minister of Transport; the Chief Executive Officer, who is appointed by the Board; and a representative of the Minister of Finance.

SANRAL has a distinct mandate – to finance, improve, manage and maintain the national road network (the "economic arteries" of South Africa). SANRAL introduced and consolidated the concept of Public Private Partnerships that culminated in the internationally acclaimed Maputo Development Corridor, the N3 Corridor and the Platinum Corridor.

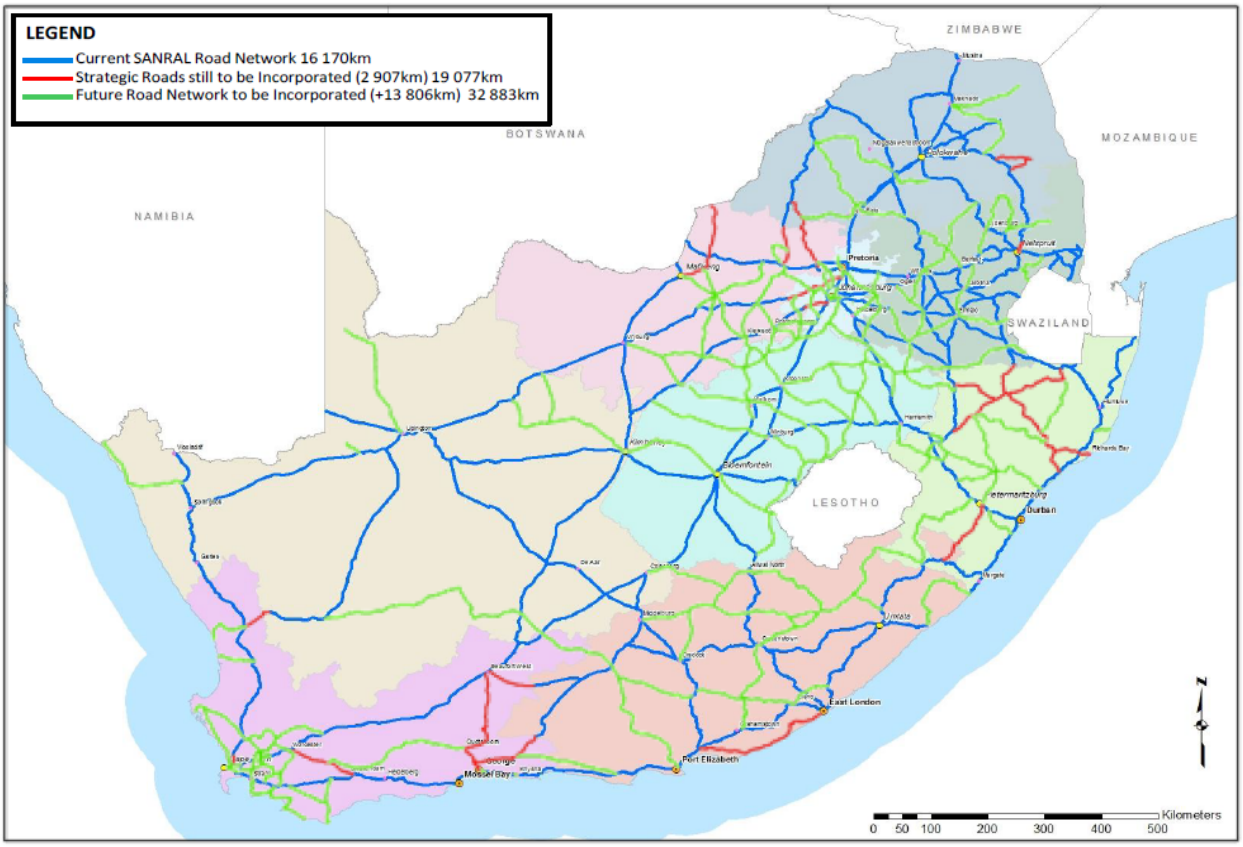
SANRAL has two primary sources of income. Non-toll roads are funded from allocations made by the National Treasury. Toll roads are funded from borrowings on the capital and money markets – bonds issued on the Bond Exchange of South Africa (BESA) in the name of the South African National Roads Agency Limited, or through the concession of roads to private sector consortia.

SANRAL manages assets worth in excess of R30 billion, without land values.

The SANRAL road network is shown in **Figure 12.1**, indicating the current SANRAL road network of 16 170 km, the strategic roads (2907 km) that will be incorporated to increase the national road network to 19 077 km.

The former Minister of Transport Mr Mr S Ndebele said that SANRAL's mandate should be broadened and the organisation repositioned so that it could provide support to provinces where capacity remained a problem. *"We cannot have as a country a good national road network whilst provincial and municipal roads remain in a sorry state,"* he said. It is thus anticipated that SANRAL will further increase their road network with a further 13 806km of mostly strategic provincial roads to a total road network of 32 883 km.

Figure 12.1 - Proposed SANRAL Road Network



12.4.2 Gauteng Freeway Improvement Project

(a) Overview of the Project

The Gauteng Freeway Improvement Project (GFIP) comprises different phases to upgrade and implement new freeways of an ultimate 560km freeway network. The first phase, comprising the upgrading of 185km of the most congested freeways has been completed in 2012.

Apart from widening of the freeways, the GFIP project also ensured that bottlenecks at interchanges are resolved. For the first phase of the GFIP, 34 interchanges were significantly upgraded, including infamous interchanges such as the Allandale, Rivonia, William Nicol, Gillooly's and Elands interchanges. The Albertina Sisulu Highway (R21), previously a provincial road has been incorporated into the GFIP and has been declared as a national road in April 2008.

Apart from the R21 the following other highways has been upgraded to minimum four lanes per direction:

- N12 between Gillooly's and the border between Gauteng and Mpumalanga;
- N1 between Golden Highway and Proefplaas IC;
- N4 between the Proefplaas IC and Swartkoppies;
- N3 between Heidelberg IC and Buccleugh Interchange; and
- N12 between Diepkloof IC and the Elands Interchange

With the planning of the Gauteng Freeway Improvement Project, SANRAL took other transport modes into consideration (the Gautrain, Metrorail and Bus Rapid Transport) and strived to create links with other transport modes to provide citizens with the choice of using public transportation or car-pooling that will alleviate congestion caused by single-passenger vehicles.

The project was approved by cabinet in 2007 after which SANRAL followed the Intent to Toll process. Amongst other requirements, SANRAL widely advertised the details of the project, the intent to toll, the proposed toll points, expected toll tariffs, upon which the public were given the opportunity to comment. The comments were considered by the Minister of Transport where after the related road sections were declared as toll roads.

Following the declaration of these freeway sections as toll roads, SANRAL could continue to raise funding from the capital markets and procure contractors to commence with construction.

Figure 12.2 indicates the extent of GFIP Phase 1. Figure 9.3 shows the further phases of the GFIP project.

Figure 12.2 - GFIP Phase 1

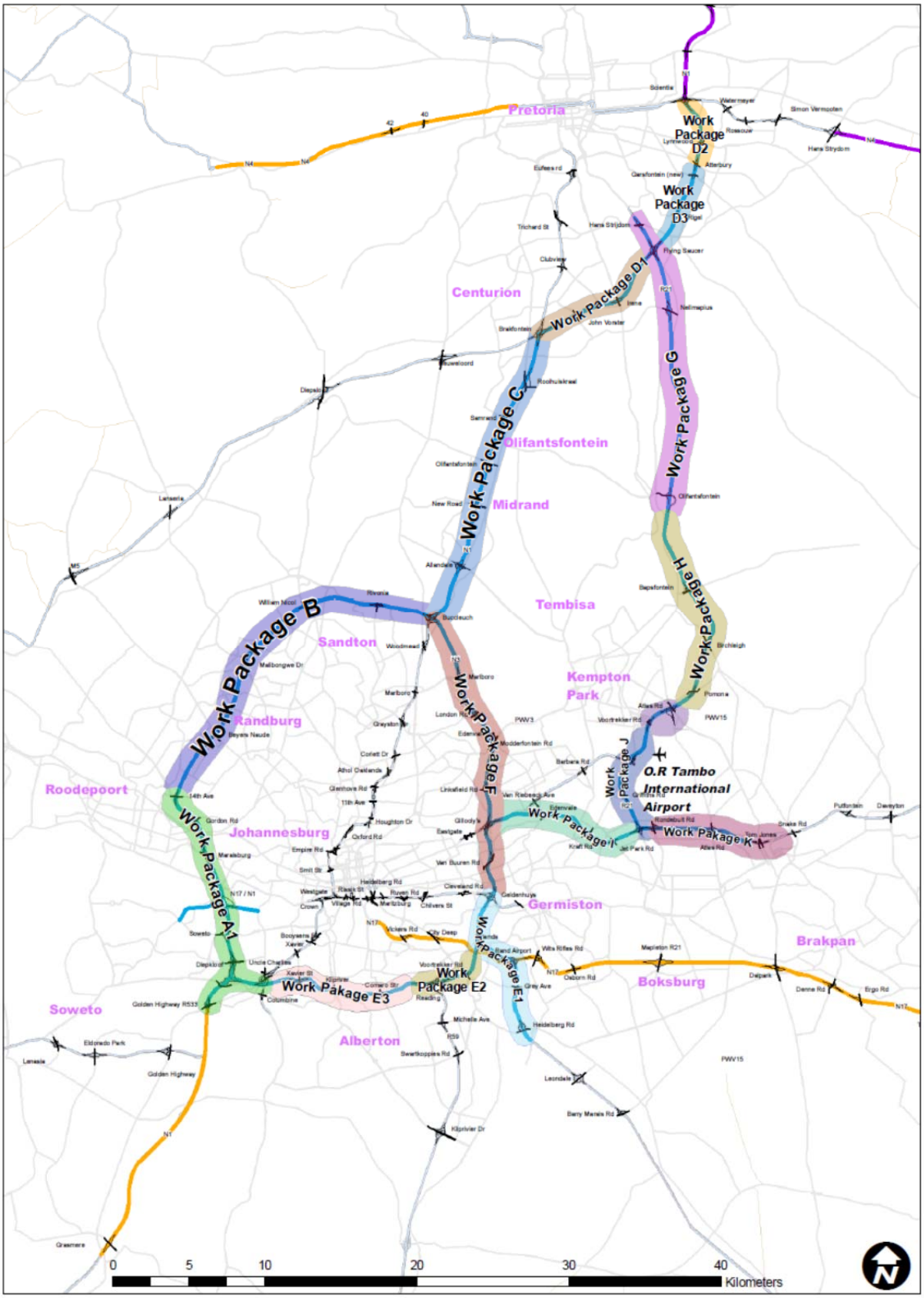
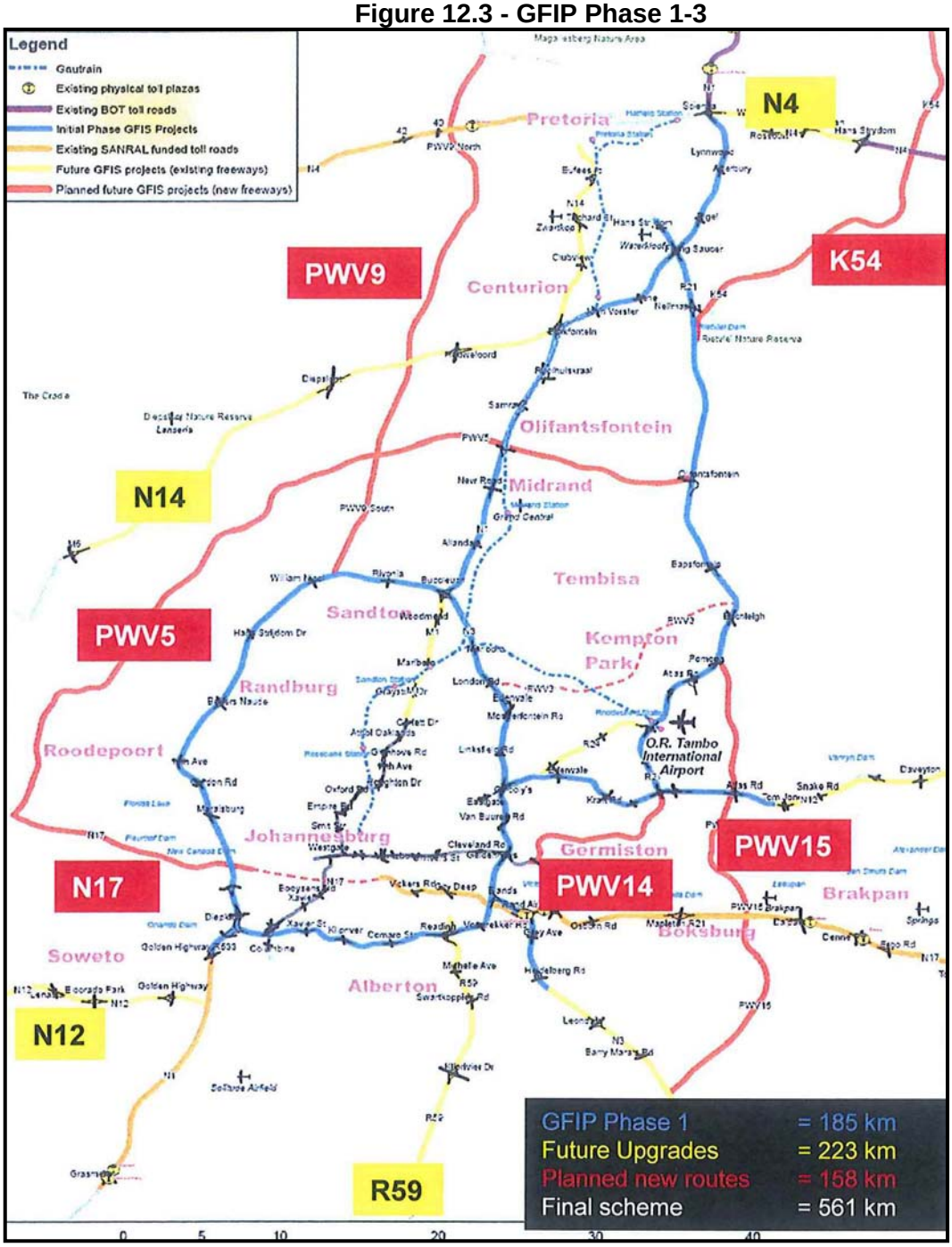


Figure 12.3 - GFIP Phase 1-3



All the roads listed in the further phases of the GFIP project have been highlighted in the various planning documents as priority routes and vital for the further development of the Gauteng Province. Considering the importance of the freeway mobility network, the following extract from SANRAL's 2011 Annual Report with regard to the funding of the GFIP roads as a toll roads in important. The implications of the significant delay of the implementation of the further phases of the GFIP project has major implications for the Gauteng Province as both the GDRT and the Metropolitan, District and Local Councils relied on the GFIP network as the backbone mobility road network of the province. The delay in toll collection impacted the implementation of GFIP Phase 2.

It should further be considered that it takes at least 2-3 years to undertake the detail design of a section of a freeway and the Environmental Impact Study if the road reserve is available and even longer if sections of the road reserve still have to be expropriated. “Since the publishing of the toll tariffs there was a great deal of public debate on one of South Africa’s major transport infrastructure projects – the GFIP. The Gauteng project responds to the needs of a growing economy and a transforming society in our economic heartland. From its inception in 2005, the project was based on the “user-pay” principle. This approach is applied to several segments of the road network. The network design includes space for a dedicated high-occupancy vehicle lane.

12.5 The Gauteng Provincial Road Network

12.5.1 Extent of the Road Network

The network classes according to RIFSA can be seen in **Table 12.3**.

Table 12.3 - Network by RIFSA Class

Class	Type of roads	Length (km)	% of network
1	Primary Distributor	274	7%
2	Regional Distributor	1 173	32%
3	District Distributor	1 031	28%
4	District Collector	926	25%
5	Access Road	1 89	5%
No Data	No Data	107	3%
	Total	3 700	100%

The current road lengths, by road type of provincial roads under jurisdiction of the Department, are shown in **Table 12.4**.

Table 12.4 - Network Length by Road Type

ROAD TYPE	ROAD LENGTH (KM)	SINGLE CARRIAGEWAY LENGTH (KM)
Freeway Dual Carriageway	196	392
Freeway Single Carriageway	13	13
Dual Carriageway	396	792
High Standard Single Carriageway	715	715
Average Standard Single Carriageway	2 222	2,222
Low Standard Single Carriageway	158	158
Total	3 700	4 292

The paved road network of GDRT has decreased in length due to the recent transfer of some roads to SANRAL. This includes the R21 from the Tshwane Metropolitan Municipality past OR Tambo International Airport.

12.5.2 Condition of the Road Network

The Gauteng Pavement Management System shows that about 80% of the total road network in Gauteng has a pavement structure older than 20 years, which is normally considered the design life of a pavement. In other words, 3100 km have already reached the end of their design life. In the 20 years since 1985, the proportion of substandard roads has increased from 4% to 24% and the proportion of those in acceptable or better condition has reduced from 96% to 76%. In order to maintain and preserve the provincial road network diligently, about 100km to 200 km of road (for a 40-year to 20-year life span target respectively) should be reconstructed or rehabilitated each year. Since 1990, the rate of repair/rehabilitation has decreased markedly, averaging only 22 km per year.

During the 2009 visual assessment the total length of the paved provincial network assessed was, 4092 km. This represents 95% of the paved carriageways shown on the RNMS as being under jurisdiction of GDRT. The assessment data, expressing the condition of the surfacing, the structural condition and functional condition through the degree (seriousness) and extent of occurrence of distresses, are used to calculate a single Visual Condition Index (VCI) for each visual segment. This index expresses the condition of the road segment as a percentage between 0% for very poor, to 100% for very good. The VCI is furthermore grouped into five condition categories that are used to describe the condition distribution of the visual segments in the road network. The categories adopted in GDRT (and the rest of South Africa) are:

- Very Good = 86% to 100%
- Good = 71% to 85%
- Fair = 51% to 70%
- Poor = 36% to 50%
- Very Poor = 0% to 35%

Figure 12.4, Figure 12.5, and Figure 12.6 shows the VCI for the road network, the road class and per area respectively.

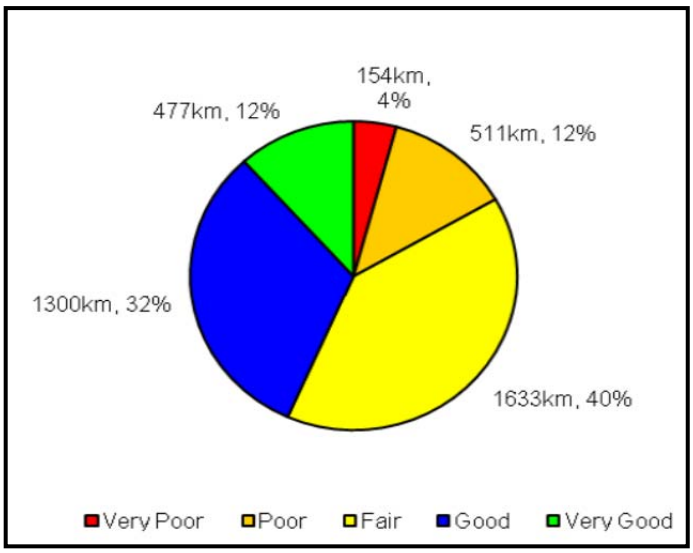


Figure 12.4 - VCI Distribution of the Network (% Length and km) for 2009

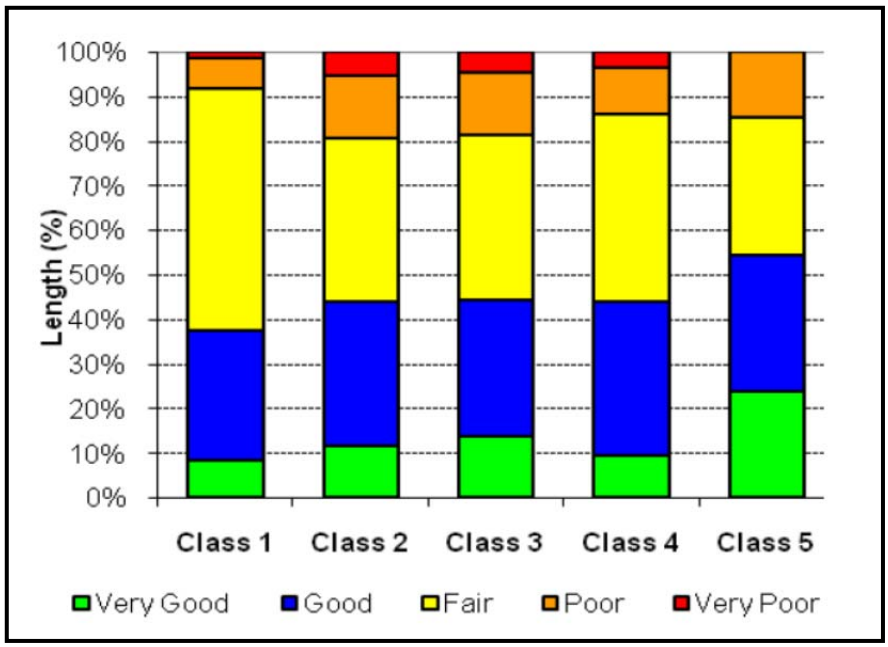


Figure 12.5 - VCI per RISFSA Road Class (% Length) for 2009

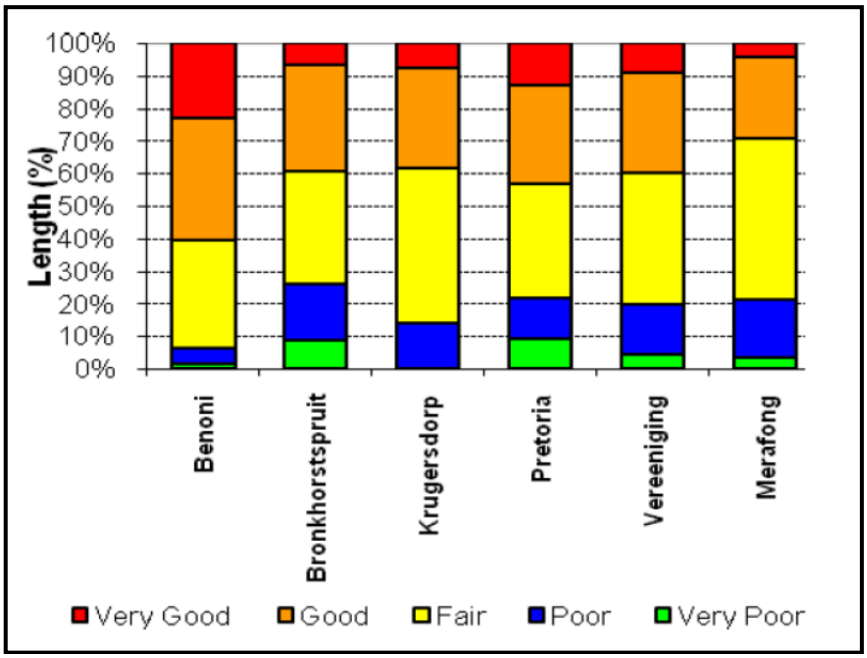


Figure 12.6 - VCI per Area (% Length) for 2009

12.5.3 NATMAP Road Network Planning Priorities

The National Transport Master Plan identified the following key strategic road projects for the Gauteng province:

Strategy 1: Develop a link between Johannesburg and Rustenburg via Lanseria Airport and the N4 Platinum Corridor

The Lanseria Airport region is envisaged to become a significant mixed-use node in Johannesburg within the near future. This node will serve the entire north-western quadrant of Johannesburg and most likely be similar in size to Midrand. Due to the size and significance of this node, regional linkages will be of critical importance. These regional linkages will not only involve linkages to surrounding nodes, such as Midrand, Sandton and Centurion, but will also involve linkages to nodes further afield, such Brits and Rustenburg. This requires linking the Lanseria node to the N4 Platinum Corridor.

The current Oberon Road (R512) link will most probably be insufficient to harness the full potential of linking Lanseria to Rustenburg. The PWV3 alignment, planned by the provincial government, is ideally suited to link Johannesburg and Rustenburg via Lanseria Airport and the N4 Platinum Corridor. This will require national government to consider the PWV3 as an extension of the N4 corridor. This freeway between Lanseria and the N4 will have to be

designed to cater for freight haulage, because it will link the commercial sector of Lanseria, the industrial sector of Brits and the mining sector of Rustenburg.

Strategy 2: Provide a link between Sandton and the N4 Platinum Corridor

Additional linkages between the core economic region (Johannesburg, Tshwane and OR Tambo triangle) of Gauteng and the N4 Platinum Corridor will be necessary to support and supplement the current N1 linkage. The planned PWV9 freeway is of relevance and can be considered as an extension of the N4 corridor, linking Johannesburg to the N4 corridor. Linking Sandton to the N4 Platinum Corridor will also improve the linkages between former settlements of exclusion and the economic opportunities found within the core economic region of Gauteng. Constructing this long-awaited freeway will enable the settlements of Soshanguve and Winterveld to access employment opportunities in Centurion, Sandton and Fourways. Also, it will help integrated the larger Johannesburg-Tshwane urban conurbation.

Strategy 3: Link the N3 to the N4 Maputo Corridor through Ekurhuleni, specifically catering for freight haulage.

Consideration may be given to linking the N3 south of Heidelberg to the N4 Maputo corridor south of Roodeplaat Dam. This will create a linkage between the Durban harbour and the N4 corridor (to link to localities such as Brits and Rustenburg), bypassing the Johannesburg and Tshwane metropolitan areas. This link will also provide the strong industrial sector of Ekurhuleni to directly access to the N4 corridor. This will require this link to be designed for freight haulage. In particular, this freight route will pass the Sentrarand rail junction, which was earmarked by Transnet to become a future alternative container depot to City Deep. This freeway will facilitate road to rail transfer at Sentrarand. The proposed link between the N3 and the N4 freeway will also improve the linkage to former settlements of exclusion. The alignment of this road will pass the settlements of Kwa-Thema, Tshakane and Daveyton, located in the Ekurhuleni Municipality, and Mamelodi, located in the Tshwane Municipality. The planned PWV17 freeway alignment will be suited for the proposed link between the N3 and N4 freeway, as it links all the settlements and industrial areas mentioned above. Accepting the PWV17 as the appropriate link will require National government to consider the PWV17 to be an extension of the N4 corridor.

12.5.4 Provincial Road Network Planning

The most recent review of the Gauteng Strategic Road Network was undertaken in 2010.

The Gauteng Strategic Road Network (GSRN) 2010 Review has produced the following:

- The Strategic Road Network map
- An updated Transportation Demand Model (GTS 2000)
- A Prioritization plan for Class 1, 2 and 3 roads
- A review of Geometric Design Standards
- A schedule of Planning Issues requiring upgrading or amendment

During the process, the following documents were consulted:

- Gauteng Strategic Road Network Review, Phases 1, 1a and 1b
- Strategic Agenda for Transport, Gauteng
- Intergovernmental Transport Charter
- Gauteng Transport Study, GTS 2000
- Gauteng (Strategic) Integrated Public Transport Network (GSPTN)
- Gauteng Spatial Development Plan (GSDP)
- Growth and Development Strategy for Gauteng
- 2010 TDM
- Gauteng Roads Development Plan
- Towards an Integrated Public Transport Strategy for Gauteng Province
- Local Authority Integrated Transport Plans (ITP), Integrated Development Plans (IDP) and Strategic Development Frameworks (SDF)
- Gauteng Road Design Manual and Typical Plans
- National Transport Master Plan (NATMAP)
- Transnet National Infrastructure Plan (TNIP)
- Gauteng Strategic Secondary Road Network

Extensive consultation was also held with all relevant role-players including officials from:

- The Gauteng Provincial Departments
    - Roads and Transport
    - Agriculture and Rural Development
    - Economic Development
- Limpopo Province

- Northwest Province
- Freestate Province
- Mpumalanga Province
- Johannesburg Metro
- Tshwane Metro
- Ekurhuleni Metro
- West Rand District Council
- Sedibeng District Council
- Metsweding District Council
- Local Councils
- SA National Roads Agency
- Passenger Rail Association SA

The Strategic Road Network map of all national, provincial and municipal Class 1, 2 and 3 roads to a scale of 1:150 000 was developed through the following process:

- Review of previous work, including Phase 1
- Decision on which roads were considered strategic and hence qualify for inclusion on the map
- Consultation with authorities
- Production of an initial map
- Modelling of the network to test compatibility and ability to serve existing and future land use and public transport
- Testing of the roads for environmental acceptance
- Required amendments to alignment or preliminary design of existing routes and conceptual alignments of new routes

A Prioritization plan was developed considering:

- An evaluation of the modelling;
- A prioritization procedure taking into account economic importance, social values, national and provincial policies, public transport, commuter needs and traffic volumes; gave the top twenty Class 1, top thirty Class 2 and top forty Class 3 routes listed in **Table 12.5**, **Table 12.6**, and **Table 12.7** respectively, and also indicated on **Figure 12.8, Figure 12.9, and Figure 12.10** respectively.

Table 12.5 - GSRN Top Twenty Class 1 Priority Roads

	Route	From	To
1.	PWV9 Southern	N1	N14
2.	PWV5 Eastern / Central	PWV9	R21
3.	N17 Western	Soweto	M1 Crownwood
4.	PWV14 Entire	M2	N12
5.	PWV16 Eastern	K133	N3
6.	PWV9 Remainder	N14	K16
7.	PWV5 Central	N12	PWV9
8.	PWV15 Northern	N12	R21
9.	PWV13 Entire	N3	PWV14
10.	PWV2 Eastern	N1	PWV17
11.	PWV17 Northern	PWV2	N4
12.	PWV17 Central	N4	PWV5
13.	PWV5 Eastern	R21	PWV17
14.	PWV15 Southern	N12	N3
15.	PWV17 Central	PWV5	N12
16.	PWV1 and 8	PWV12a / N17	N14
17.	PWV12a / N17	PWV1	PWV5
18.	PWV6	N1	PWV17
19.	PWV3 Eastern	N3	R21
20.	PWV3 Western	N14	N1

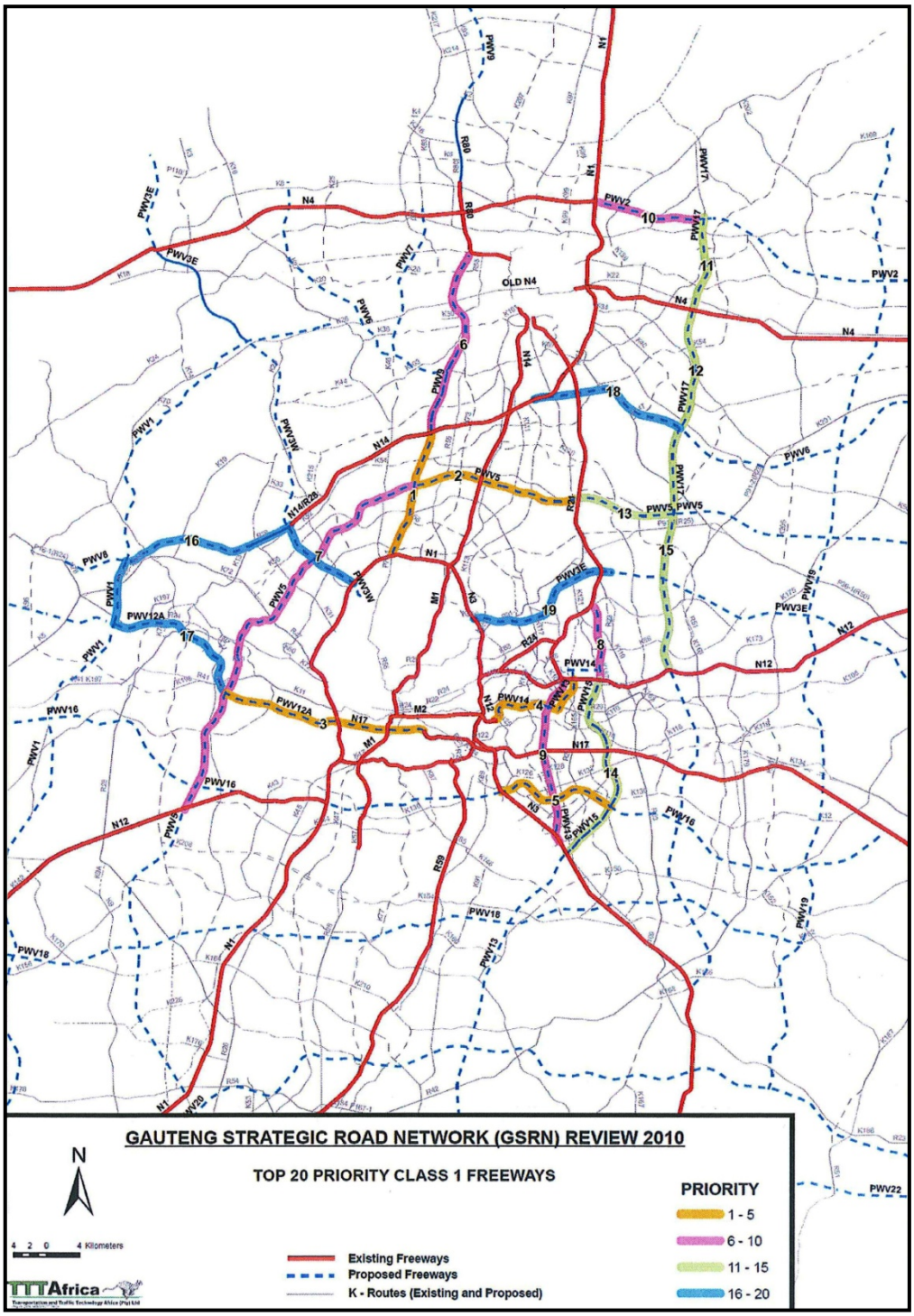


Figure 12.8 - Gauteng SRN Class 1 Road Priorities

Table 12.6 - GSRN Top Thirty Class 2 Priority Roads

	Route	From	To
1.	K57	K142	K158
2.	K71	K103 North	D49
3.	K105	K220	K121
4.	K145	K22	K34
5.	K69	K34	K16
6.	K71	N14	P206-1 (M1)
7.	K111	Nellmapius	PWV5
8.	K60	K74	K46
9.	K46	K60	N14
10.	K60	K46	K73
11.	K73	K71 North	K60
12.	K101	K38	K71
13.	K109	K101 South	K101 North
14.	K43	K142	K122
15.	K56	K101	K117
16.	K60	K71	K105
17.	K11	Old P42-1	K102
18.	K139	K14	K16
19.	K69	Rubenstein	Atterbury
20.	K54	PWV6	D964
21.	K97	PWV2	K14
22.	K121	K105	K68
23.	K58	K71	K117
24.	K56	K72	Cedar
25.	K16	30th Avenue	Baviaanspoort
26.	K54	K52	K101
27.	K216	PWV9	K95
28.	K117 / K127	N17	K88
29.	K115	K58	Terrace
30.	K27	K46	K101

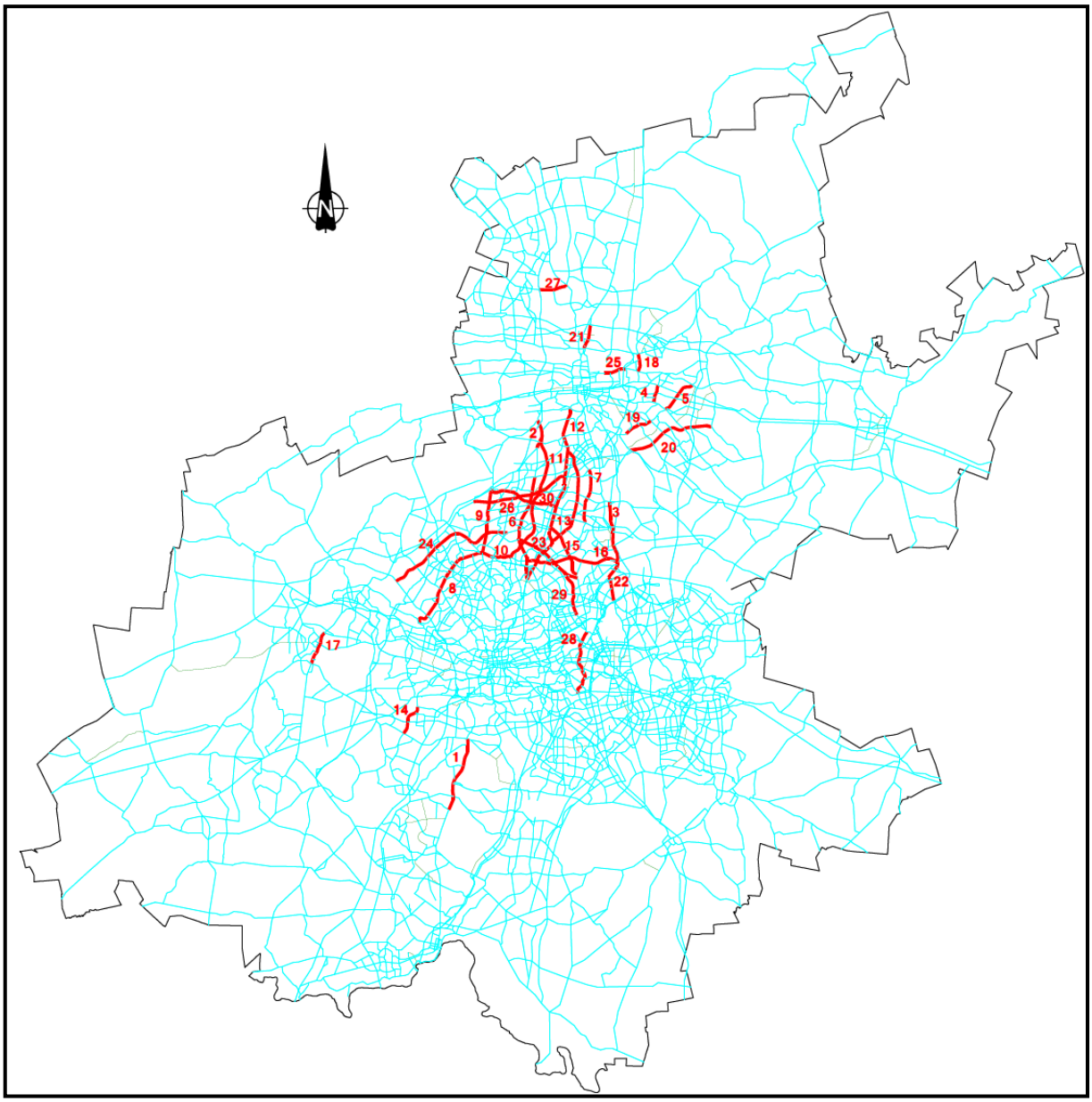


Figure 12.9 - Gauteng SRN Class 2 Road Priorities

Table 12.7 - GSRN Top Forty Class 4 Priority Roads

	Route	From	To
1.	Upgrade D2150	Stretford Station	K45
2.	De Villebois Mareuil	K151	K40
3.	Portion of Midvaal Spine Road	K164	K210
4.	Main / New Canada Rd	Main Reef Rd	Soweto Highway
5.	Wit Deep Rd	Main Reef Rd	Commissioner Street
6.	Link Odendaal-Westlake Rd	Main Reef Rd	Vincent Rd
7.	D162 / D665	K211 / K213	Homestead
8.	Olievenhoutbosch Rd	Botha Ave	R21
9.	Dualling Jan Smuts Ave	7th Ave	Bompas Rd
10.	North-south Class 3 Spine Rd Savannah City	K158 / D786	K47
11.	Olievenhoutbosch Rd	Brakfontein Rd	Nellmapius Drv
12.	East-west Class 3 in Savannah City	D2150	P1-1 / K57
13.	East-west Class 3 in Klip River Housing Project	D786	D766 / K2529
14.	Trichardts Rd	Kingfisher Rd	Barry Marais Rd
15.	K101 (Old Warmbaths Rd)	K212	Tshwane Border
16.	Kelvin-Northway Link	Bowling Ave	Marlboro Drv
17.	D92	Welverdiend	P61-1
18.	Link N4 West to PWV9	DF Malan Drv	PWV9
19.	Samrand Rd	Rooihuiskraal Rd	K71
20.	Thami Mnyele	Brian Mazibuko West	K105
21.	Alexander Rd	Henry Rd	K16
22.	Main Rd, Comptonville	Golden Highway	Columbine Ave
23.	Andrew Mapheto / Rev RTJ Namane	DM Morakane	Axel
24.	Pretoria Rd	K109	K68
25.	Spencer Rd	Main Reef Rd	Modise Street
26.	Road D223	K34	K16
27.	Zwane St Class 3 Link with Hendrik v Eck Blvd	Zwane Street (Sharpville)	K55
28.	Ravenswood	K90	K155
29.	Trichardts Rd	Ridge	Paul Smit

	Route	From	To
30.	Ascot Rd North of K174 & Portion of Kariba Street	K174	Sharpville
31.	D2377	K40	D670
32.	Stanley / Knights	Main Reef Rd	Pretoria Rd
33.	Bierman	MC Botha	Sontonga
34.	Dely / Brooklyn Rds	Lynwood Rd	Lois
35.	8th St Vrededorp	Brixton Rd	Solomon Street
36.	D1197	P1-1 / K57	D904
37.	D37 / D2106	K14	K6
38.	Class 3 Road in Ratanda	K135	K174 / P25-1
39.	Ndabeztha	Vlakfontein Rd	Modjadi
40.	Lintvelt Ave	Lavender Rd	Wonderboom Airport

12.5.5 Gauteng Department of Roads and Transport – Current Road Projects

The current (2012/13) budget allocation of the GDRT is R4.36 billion, which includes R1.245 billion for infrastructure. The infrastructure budget is further allocated as follows:

- Maintenance R783 million
- Construction R276 million
- Design R72 million
- Transport Branch R114 million

It can be seen that a relatively small amount is available for road upgrading and new roads. The road upgrading list as prioritised by the GDRT is shown in **Table 12.8**.

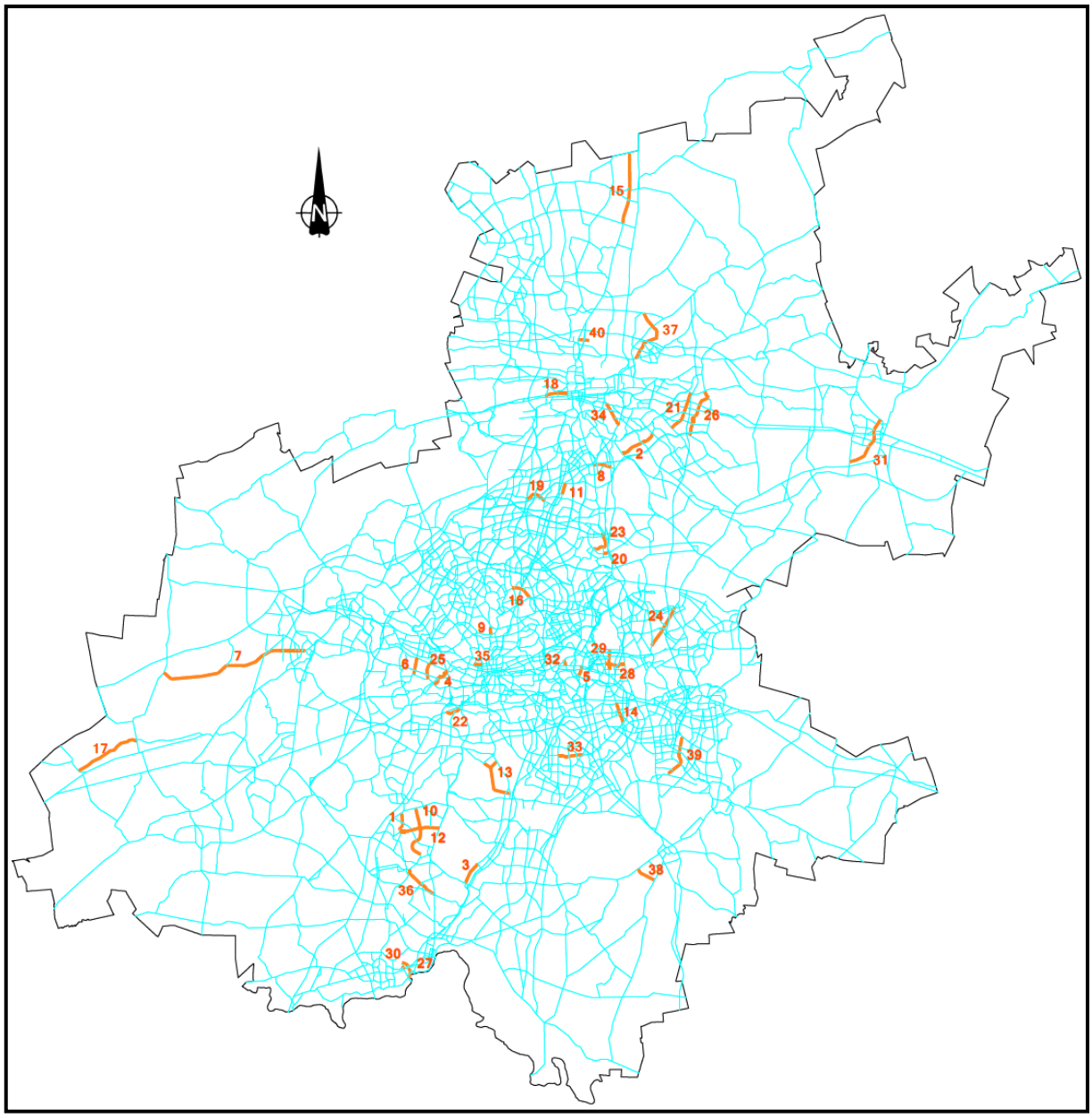


Figure 12.10 - Gauteng SRN Class 4 Road Priorities

Table 12.8 - GDRT Road Priorities

No	Project	Description	Funding Source	Municipal Area
1	K71 (R55)	K71 Between K103 (Wierda rd) and Laudium (doubling of existing road) (P66-1)	DRT	TMM
2	D2529	Surfacing of Cayman road as an access road to the Eye of Africa Development	DRT	Sedibeng
3	K46	K46 William Nicol: Doubling of road K46 from Fourways to PWV 5 (Erling road) (P79-1)	Dept / Developer	JMM
4	K46	K46:PWV 5 to Diepsloot/N14: Doubling of road	Dept / Developer	JMM
5	K15 (R512)	Doubling of Adcock Str(R55) from Dobsonvile to Protea Glen. (Last section) (D524)	DRT	JMM
6	K72/P126-1	K72/P126-1: Construction of P126-1 N14 interchange including 3km approaches		Mogale City
7	K142	Construction of road over rail to provide a link with Lenasia Protea Glen	DRT / JMM / PRASA	JMM
8	K133 (P4-1) (R103)	Doubling of road K133 (P4-1) between road P58-1 (R554) and road P140-1 (Nigel road)	DRT	EMM
9	K97 (R101)	Link between N4 to P1-3. Construction of (R101) northwards	DRT	TMM
10	P1-1 (K57) (R82)	P1-1 (R82) Old Vereeniging road: Upgrading of road to new dual carriage road from D766 (Eikenhof) to D1073 (Walkerville)	DRT	Sedibeng
11	P1-1 K57 (R82)	P1-1 (R82) Old Vereeniging road : Upgrading of road between Walkerville (D1073) and De deur (K164)	DRT	Sedibeng
12	K164 (R551)	D473 (K164): Upgrading of the intersection at De Deur. (from D904 to D905) Vereeniging	DRT	Sedibeng
13	K148 / N3	Construction of interchange K148 / N3 and access to Tambo Springs	DRT / Developer	EMM
14	K154 (D1313)	Upgrading of road K154 from a gravel road to a surfaced dual carriageway road. Gauteng Highland (Eikenhof) 850m	Developer	Sedibeng / Midvaal
15	K154 (D1313)	Upgrading of road K154 from R59 toK57 (R82)	Developer	Sedibeng / Midvaal
16	K11	Construction of new road linking Meyerton to Sebokeng to link to industries		Sedibeng
17	K60 (P70-1)	Section between Megawatt Park and (Kyalami Rd to Corporate Park) Kyalami/N1		JMM
18	K60	Construction of a single carriageway between Rivonia Rd K73 (M9) and Main Rd (PWV9)		JMM
19	K60	New road from P66-1 (R55) across N3 to D51 (Allandale road) M39	DRT / SANRAL /	JMM
20	K60	Access Rd to Ivory Park and Tembisa between K56 (D51)and Chapman Rd (K117)		JMM
21	K60	Access Rd to Ivory Park and Tembisa between Chapman RD (K117) and K105		JMM
22	K101	Upgrade of interchange K101 (M39)(R101) (P1-1) and K58		JMM
23	P219-1 (K43)	Upgrading of Klipspruit Valley Rd (M10 between N12 and Nirvana Rd (Lenasia South) To improve the link between		JMM
24	K69	Upgrading and doubling of Hans Strijdom from the N4 to Mamelodi to K54		TMM
25	K69 / K34	Construction of interchange Lynwood / Hans Strijdom ()		TMM
26	K198	Construction of new road from Leratong to Corlett St (Witpoortjie)		JMM
27	K170	Construction of interchange at N1/19 and Golden High way, Access to Sebokeng and Evaton		
28	K16	New Rd from Wattloo to Mamelodi (K69)		TMM
29	K101	Doubling of existing road P1/2 from K54 (R101) to Lenchen Pra Ave (Rooihuiskraal)		TMM

No	Project	Description	Funding Source	Municipal Area
30	K101	Doubling of existing road P1/2 from N1 to road D795 (Midrand)		JMM
31	K101	Doubling of existing road between road 795 and New Rd		JMM
32	K101	Doubling of existing road P1/1 (R101) from K103 (M10) to the end of dual carriageway 1853 (Eeufees road)		TMM
33	K101	Doubling of Road P1-1 (R101) from M10 (K103) to N1		TMM
34	K103/K69	Doubling of existing road (Waterkloof Air Force Base Pta) K103 (M10) From Kloofsig to R21		TMM
35	K122	New road south of Naturena from road K45 (Golden Highway)(Nance field) to P1/2 (Vereeniging road)		
36	P91/1	Doubling of R91-1 (R25) Wikus to M57 (P58-1)		
37	P3-6 (N12)	Doubling of P3-6 and railway bridge from P41-1 (R501) to Provincial Border		
38	P2-5 (K54) (R513)	K54 (P2-5) From Tsamaya road to K22 Zambezi Ave to Tsamay Ave, from D713 to K54 Road rehab.		TMM
39	K102	Phase 4: New Construction (Hopewell St) from Maimane St to 56th St. Dobsonville.		JMM
40	K102	Phase 5: New construction (Hopewell St) from 56th St. Dobsonville to Roodepoort		JMM
41	K14	Upgrading of P2-5 (R513) Chris Hani to Cullinan		TMM
42	P66-1 (K71) R55	Doubling of road P66-1from N14 Diepsloot to Kyalami		JMM
43	K77	Elizabeth road to K154 (Part of Highlands project)		Sedibeng / Midvaal

12.6 Gauteng Local Municipality Road Networks

Figure 12.11 indicates the metropolitan, district and local municipality borders in Gauteng. The City of Tshwane includes the previous Metsweding District Municipality from 2011 and is now responsible for the municipal road planning, upgrading and maintenance in the area.

Figure 12.11 - Geographical contexts of metropolitan, district and local municipalities in Gauteng

12.6.1 Road Network City of Tshwane

The City of Tshwane Metropolitan Municipality (CTMM) has a well-developed road network, although many roads in the previously disadvantaged areas to the north are not paved. CTMM is also centrally situated on the national road network with direct links to Mozambique, Botswana and Namibia along the east-west N4 route, and with Zimbabwe along the south-north N1 route.

The CTMM is currently responsible for all Municipal Roads in Tshwane (a limited number of Class 2 roads, but mainly Class 3 and lower order roads).

There are 5209 km surfaced municipal roads (lane-kilometres) and 2231 km gravel roads in the CTMM. The surfaced road network consists of 18% primary roads, 13% secondary roads, 19% are main tertiary roads and 49% are minor tertiary roads. The gravel road network consists of 4% secondary roads, 4% are main tertiary roads and the remainder is minor tertiary roads.

The main road network follows a radial system centred on the CBD of Pretoria, which is the dominant economic node. The strong urban decentralisation trend towards suburban nodes during the last few decades has created a demand for concentric roads. The greatest deficiency in the main road network is the lack of a continuous major ring road around the city, with supporting routes, to serve suburban nodes.

The N1 eastern by-pass, the N14 (Krugersdorp freeway) and the new N1/N4 Platinum toll route, form part of the ring road to the south, east and the north. The remaining missing link is the planned north-south PWV9 to the west, which could also forms the central mobility spine of the Mabopane-Centurion Development Corridor (MCDC).

The responsibility for the main road network is shared between South African National Roads Agency Limited (SANRAL), GDPTRW and the CTMM. The pace of growth and the lack of funds at metropolitan level resulted in the increased use of the national and provincial roads by local urban traffic. This situation is exacerbated by the negative impact on urban traffic of tolling the urban sections of the existing N1. This calls for a more integrated approach between the various spheres of government to the planning, management and funding of roads. These tolls are overloading some of the Tshwane roads whilst the Tshwane transport budget cannot cope with the imposed burden.

The existing road infrastructure is over-extended in parts of the city which are experiencing development pressure. This is particularly evident in areas like Olievenhoutbos, Irene/Highveld, Menlyn, Hatfield, Brooklyn and Zambezi/Montana.

Backlogs in regard to unpaved roads are significant, especially in the northern parts of Tshwane, such as Ga-Rankuwa, Mabopane, Soshanguve, Winterveld, Temba and Hammanskraal.

It is also worthwhile to mention that the overall structural index of CTMM surfaced roads has decreased since 1991 from 0,9 to 0,85 and the surfaced index from 0,75 to 0,72 over the same period due to a lack of funds for road maintenance. In other words, the quality of the roads has decreased in the said period.

12.6.2 City of Johannesburg

The road network of the City of Johannesburg can be seen in **Figure 12.12** and comprises of 9247km roads, of which approximately 10% (922 km) are gravel. The Johannesburg Roads Agency is responsible for approximately 1800 traffic lights and malfunctioning is a common problem due to rain, power cuts and power distribution faults.

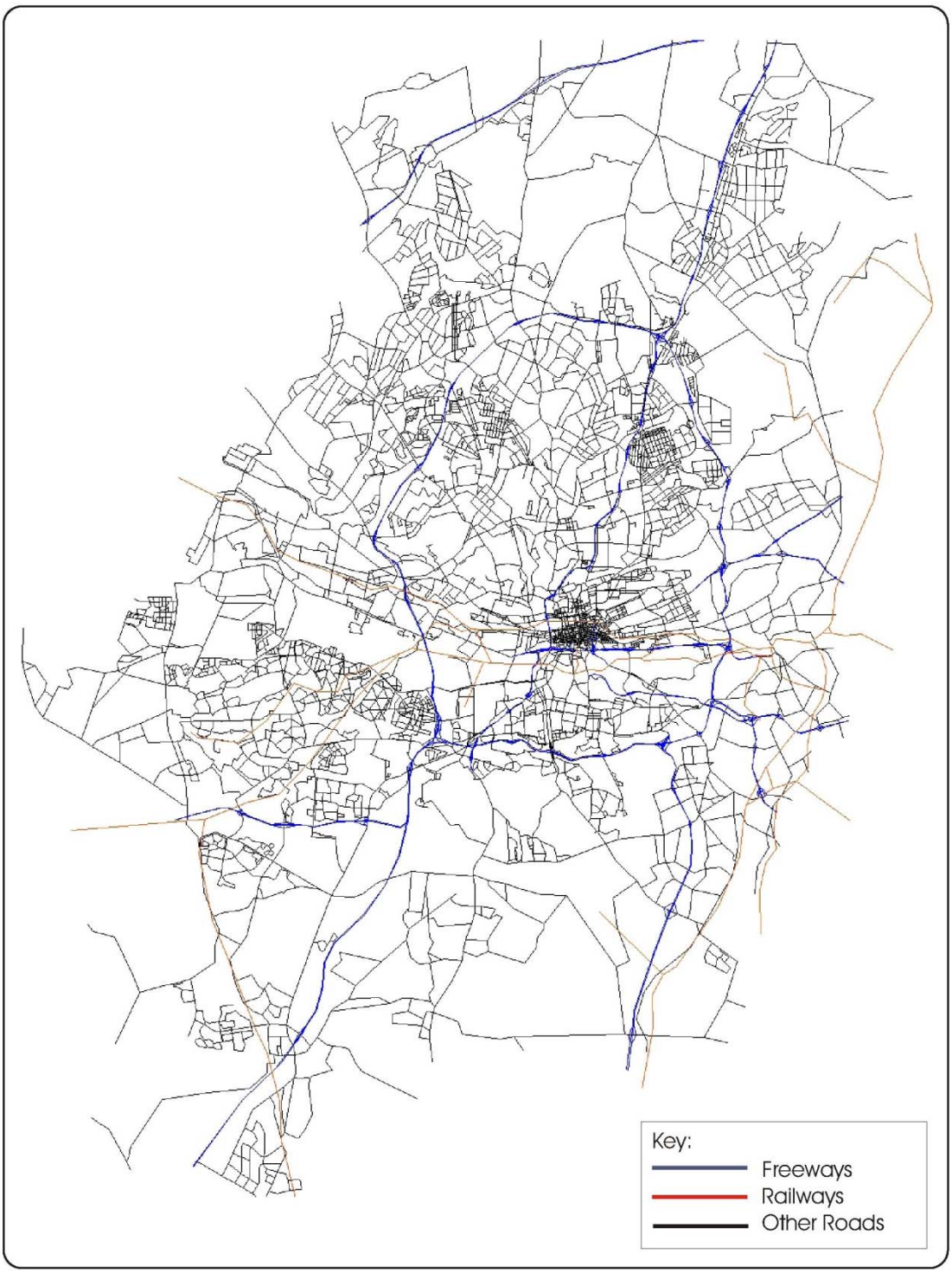


Figure 12.12 - City of Johannesburg Road Network

The City of Johannesburg is divided into 11 regions. These regions can be seen in **Figure 12.13**. A summary of the road condition in each region is given in **Table 12.9**.

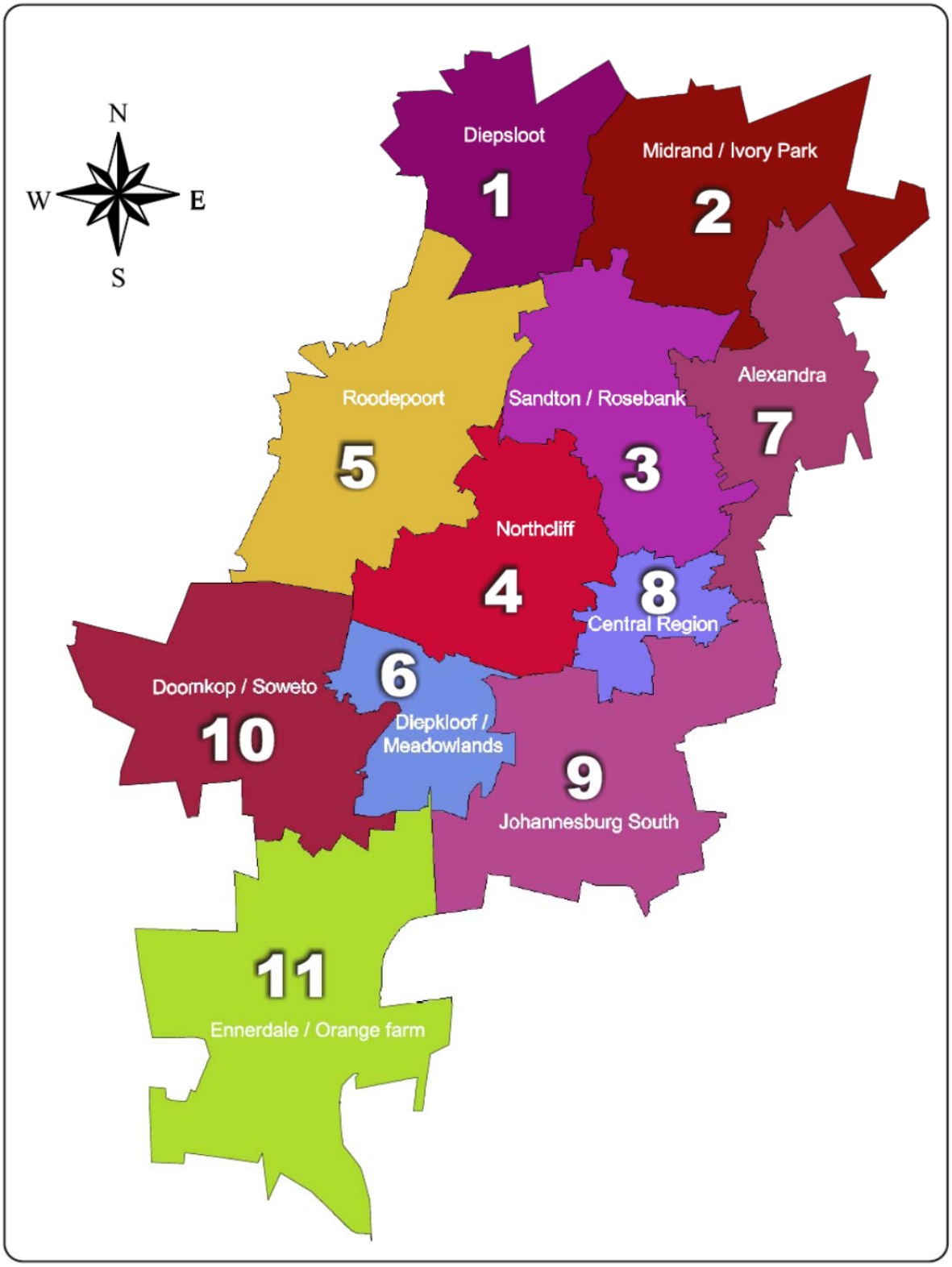


Figure 12.13 - City of Johannesburg Regions

Table 12.9 - Summary of Road Condition

Region	Very Poor		Poor		Average		Good		Very Good	
	Total (km)	% per Region	Total (km)	% per Region	Total (km)	% per Region	Total (km)	% per Region	Total (km)	% per Region
Region 1	-	-	-	-	-	-	-	-	-	-
Region 2	5	5,6	21	23,6	49	55,0	10	11,3	4	4,5
Region 3	10	1,1	74	7,9	452	48,5	257	27,6	139	14,9
Region 4	6	4,3	15	10,8	73	52,5	32	23,0	13	9,4
Region 5	2	3,7	6	11,1	24	44,4	12	22,2	10	18,6
Region 6	10	1,9	30	5,6	120	22,4	235	43,9	140	26,2
Region 7	2	0,5	29	7,6	181	47,5	118	31,0	51	13,4
Region 8	1	0,8	11	9,0	61	50,0	38	31,2	11	9,0
Region 9	13	1,3	95	9,3	353	34,5	364	35,5	199	19,4
Region 10	6	2,0	29	9,9	67	22,8	132	44,9	60	20,4
Region 11	6	1,6	29	7,6	180	47,4	127	33,4	38	10,0
Total	61	1,6	339	8,6	1560	39,5	1325	33,5	665	16,8

Notes: At the time of compilation of the above data no information was available for Region 1 (Diepsloot). It is noted from the information presented above that Region 9 (Johannesburg South) has more kilometres of roads in a very poor and poor condition. Region 9, interestingly also includes more kilometres of roads in very good condition, although it will be noted that this is a relatively densified area within the City. On a percentage basis, Region 6 (Sandton/Rosebank) has a higher proportion of roads in a very good condition than any other region.

12.6.3 Ekurhuleni Metropolitan Municipality

Ekurhuleni Metropolitan Municipality (EMM) has some 8300 km of roads, including 6700 km of surfaced roads and 1600 km of gravel roads. The great length of roads in the EMM is largely the result of the extensive provincial road network of some 1310km.

EMM has the greatest length of freeway, 0.43 lane km per 1000 population compared with 0.29 in Johannesburg and 0.42 in Tshwane. Freeway and arterial road provision per square kilometre in EMM is comparable with both Johannesburg and Tshwane (0.46 lane km/km² of freeway and 1.05 lane km/km² of arterial road compared with 0.59 and 1.67 in Johannesburg and 0.37 and 1.09 in Tshwane). Considering the amount of vacant and rural land in the EMM, the foregoing indicates good road provision in the EMM with adequate spare capacity.

The extent and condition of the Municipal roads as reflected on the EMM Roads Management System are given in **Table 12.10**.

Table 12.10 - Extent of the Municipal Road network

Road type		Road Class	Very good km	Good km	Fair km	Poor km	Very poor km	Total length km
Paved	Freeways							
	Dual carriageway roads / streets	Primary (P)	672.7	256.2	53.4	42.7	42.7	1067.7
	Access roads	Secondary (S)	609.3	222.5	48.4	29.0	58.0	967.2
	Other single carriageway	Main Tertiary (T) and Tertiary (t)	2775.7	1206.5	269.3	139.8	269.3	4660.6
Sub Total (Paved)			4057.7	1685.2	371.1	211.5	370.0	6695.5
Gravel	Normal urban	Primary (P) and Secondary (S)	0.4	0.0	4.9	0.0	1.0	6.3
	Access roads	Main Tertiary (T) and Tertiary (t)	14.0	87.1	335.6	489.3	255.2	1181.2
Sub Total (Unpaved)			14.4	87.1	340.5	489.3	256.2	1187.5
Total			4072.1	1772.3	711.6	700.8	626.2	7883.0

The extent of National and Provincial roads is estimated at 1310km (Metropolitan Spatial Development Framework, 2005). It should also be noted that the extent of gravel roads is considered to be underestimated in the above table, mainly due to the omission of roads in informal settlements and some outlying areas of the Metropole.

12.6.4 Sedibeng

The SDM comprises of three Local Municipalities (LMs) as indicated in **Figure 12.14**.

- Emfuleni LM (commercial nodes are Vereeniging and Vanderbijlpark);
- Lesedi LM (commercial node is Heidelberg); and
- Midvaal LM (commercial node is Meyerton).

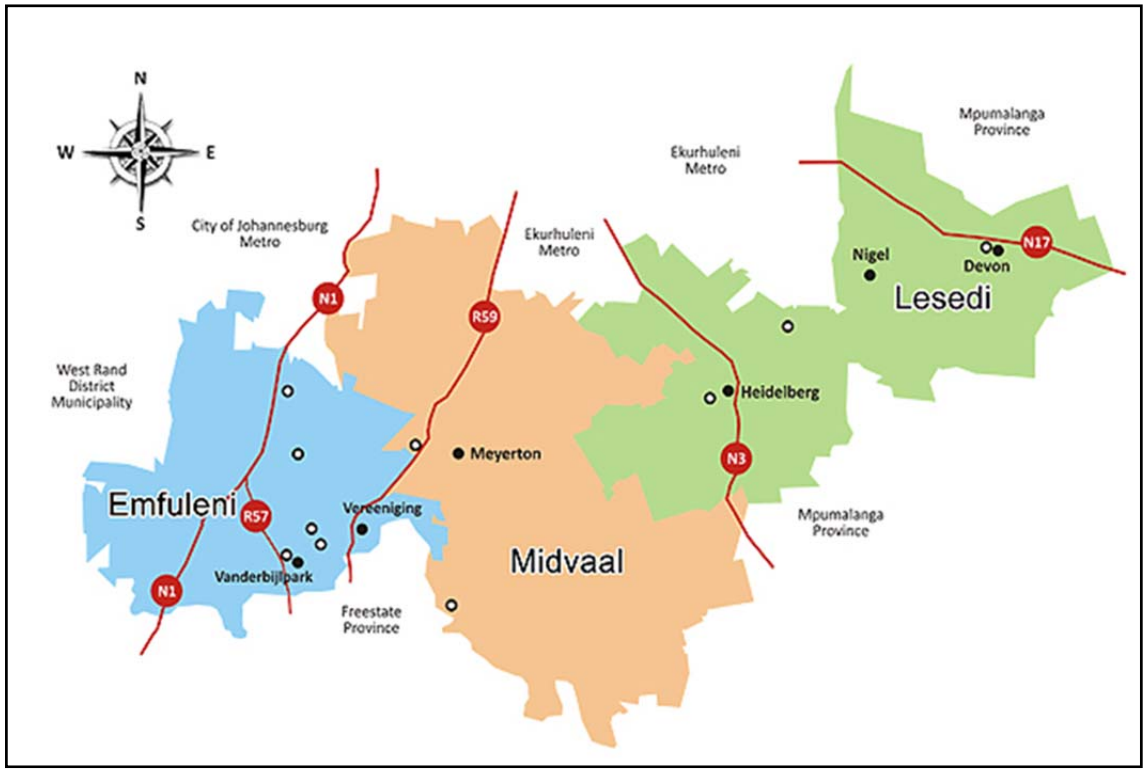


Figure 12.14 - Sedibeng Local Municipalities

The Sedibeng main road network can be seen in **Figure 12.15**. The following road linkages are considered the main **north-south road links** in support of the major nodes in Sedibeng:

- National Route N1 – Linking Vanderbijlpark and the Free State with Johannesburg in the north;
- National Route N3 – Linking Johannesburg/Ekurhuleni in the North to Heidelberg and Mpumalanga towards the south;
- Provincial Route R59 – Linking Vereeniging with Meyerton and northwards towards Alberton in Ekurhuleni;
- Provincial Route R553 (Golden Highway) – Linking Vanderbijlpark through Sebokeng/Evaton towards Johannesburg in the north;
- Provincial Route R82 – Linking Vereeniging with De Deur and Walkerville towards Johannesburg in the north;
- Provincial Route R23 – Alternative to the N1 linking Benoni in the north to Balfour in the south;
- Provincial Route R51 – Linking Springs in the north to Balfour and Vaal Dam in the south; and

- Provincial Route R549 – Linking Heidelberg and Ratanda with Deneysville and the Vaal Dam.

The following road linkages are considered the main **east-west road links** in support of the major nodes in Sedibeng.

- Provincial Route R42 – Main east-west linking Lochvaal in the southwest through Vanderbijlpark, Vereeniging, Heidelberg, and Nigel to Vischkuil/Endicott in the north-east towards Delmas;
- Provincial Route R29 - Linking Devon/Impumelelo with Vischkuil/Endicott and further west with Springs in Ekurhuleni;
- Provincial Route R54 - Linking Vereeniging and Vaal Marina towards the south;
- Provincial Route R551 - Prominent east-west link between Evaton/Sebokeng in the west and Meyerton towards the east, further along to Heidelberg within Lesedi Local Municipality, continuing further along the R42 National Route N1;
- Provincial Route R557- Linking Walkerville in the west with the Suikerbosrand Nature Reserve in the east;
- Provincial Route R550 - Linking Kliprivier with Nigel; and
- Provincial Route R557 - Linking Walkerville in the east with the Grassmere (N1) toll gate and Ennerdale.

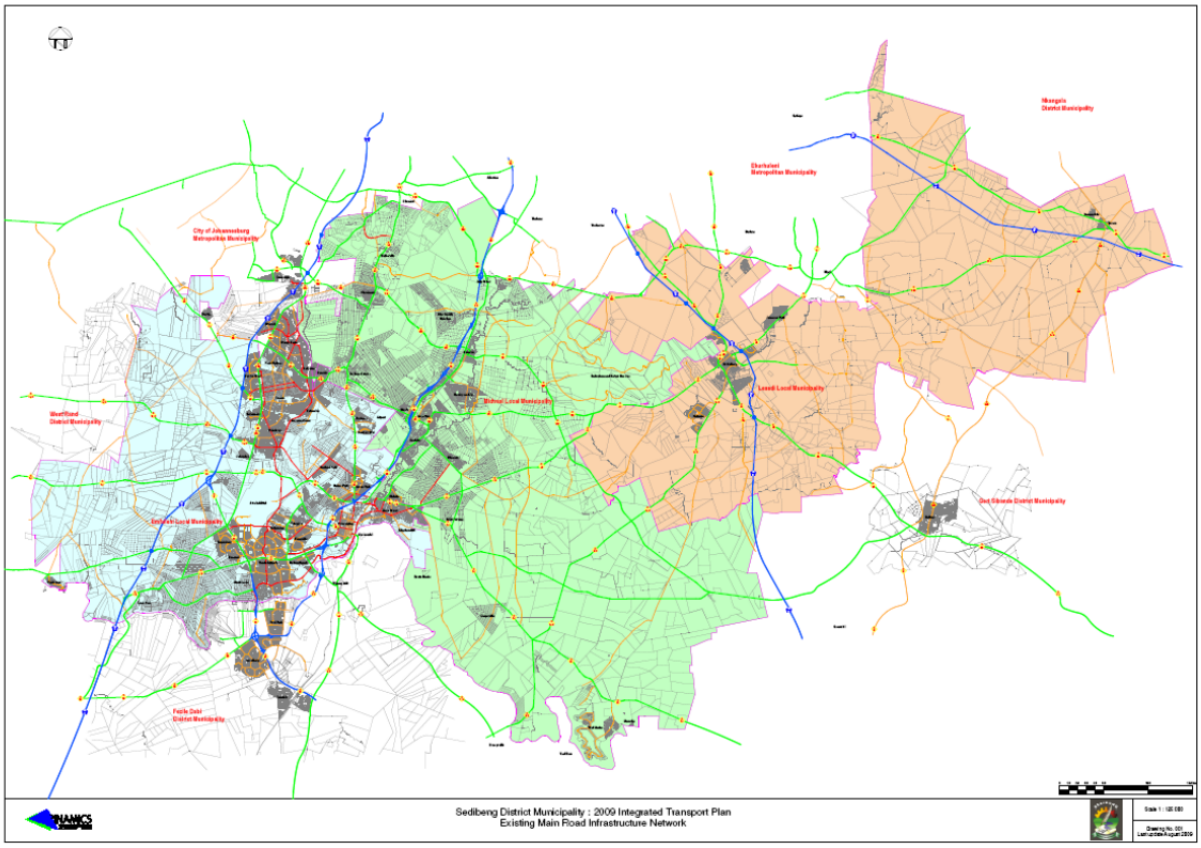


Figure 12.15 - Existing Sedibeng Main Road Network

12.6.5 West Rand District Municipality

The West Rand District Municipality comprises of the four local municipalities i.e., Mogale City Local Municipality, Merafong City Local Municipality, Randfontein Local Municipality and Westonaria Local Municipality. Each Local Municipality is responsible for the upgrading and maintenance of its own road network. **Table 12.11** and **Table 12.12** indicate the extent of roads in the West Rand.

Table 12.11 - West Rand District Municipality Major Road Network

Classification of Roads	Kilometre		
	Paved	Gravel	Totals
Class 1-3: Freeways (National Roads), Major arterials (Provincial) and Minor arterials (Municipal)	185.9	0	185.9
Class 4a: Collector roads (CBD's, Municipal roads)	156.2	6.6	162.8
Class 4b: Collector roads (Residential areas, municipal roads)	159.1	34	193.1
Class 5: Access roads (municipal roads)	871.2	473.4	1344.6
TOTAL	1372.4	514	1886.4

Table 12.12 - West Rand District Municipality Roads and Responsible Authority

Classification of Roads	Municipality				
	Mogale	Randfontein	Westonaria	Merafong	Total
National & Provincial Paved	101	63	22	287	473
National & Provincial Unpaved	0	0	0	110	110
Local Paved	596	333	258	324	1511
Local Unpaved	274	141	100	102	617
Total	971	537	380	823	2711

(a) Merafong City

There are two National and four Provincial roads providing mobility and access function to the local municipalities. These are as follows:

- N12 - The north-south route linking Gauteng and North West
- N14 - Links Merafong City Local Municipality with North West Province, Mogale City LM and Tshwane
- R501- Links Carletonville – Fochville – Parys(Free State)
- R500 - Access from N12 and N14 to Carletonville
- R559 - Links Local Municipality with Randfontein
- R41 – Links Local Municipality with Randfontein

The main freight route, within the local municipality, includes the N12, N14, R500, and R501 which carries significant traffic of heavy vehicles per day in and out of Merafong City LM. **Table 12.13** indicates the road condition in Merafong.

Table 12.13 - Merafong Road Conditions by Road

MERAFONG LOCAL MUNICIPALITY					
Township	Roads		Length of Roads (m)	Condition of Roads	Comments
	PAVED (m)	UNPAVED (m)	-	-	-
Carltonville	141,765	0	141,765	Fair to Good	Keep up maintenance
Khutsong	42,000	57,000	99,000	Fair to Poor	Pave unpaved roads and maintenance of SW and existing roads.
Fochville	65,649	0	65,649	Good	Keep up maintenance
Kokosi	13,293	42,986	56,279	Fair to Poor	Main road into Kokosi turn into a river once it starts raining. It needs to be redesign and constructed. Majority of roads are Gravel.
Wedel	28,900	0	28,900	Fair	Few storm water problem
Greenspark	3,307	1,523	4,830	Fair	Keep up maintenance
Welverdien	28,904	0	28,904	Fair	Keep up maintenance
Total	323,818	101509	425,327		

Merafong City Local Municipality comprises of Carletonville, Khutsong proper, Khutsong South, Fochville, Kokosi, Oberholzer, Wedela and Welverdiend. Carletonville, Welverdiend, Oberholzer and Fochville road conditions are fair to good paved roads. These roads will need maintenance to ensure that they do not deteriorate to the stage where they will need to be rehabilitated.

Khutsong Proper has a good road network on in main roads through the township. The rest of the area has bad and non-maintained gravel roads. In Khutsong Proper, there are road signs as well as speed calming measures. Road sign marking for school areas are visible. The majority of roads in Khutsong Proper and Khutsong South are gravel.

It is the correct time to update the 2002/3 PMS to confirm that the road condition have stayed the same or improved as a result of maintenance effort. It is however expected that the condition of roads have deteriorated as the local municipalities do not have enough funding to maintain the road network.

Table 12.14 reflects the Paved Road Condition as per Visual Condition Index (VCI) for all roads within the Merafong City and also indicates the road lengths within various ranges of the VCI.

Table 12.14 - Paved Condition of Merafong City Roads

Very Good	Good	Fair	Poor	Very Poor
14%	8%	38%	39%	0%

Based on the above table and from the inspections carried out by the consultants, the following can be reported:

- It is urgent that the PMS be updated to reflect the current status as this helps in planning for projects and budgets.
- The road network is in a fairly good condition despite lack of continuous maintenance program due to inadequate funding.
- There are more poor roads in Kokosi Township compared to the neighbour Fochville due to the past apartheid government administration.
- Has a higher present of fair and poor roads.
- There are pockets of pot holes but these are being dealt with as funds become available.

(b) Mogale City

There are two National and Provincial roads providing mobility and access function to the Mogale City Local municipalities. These are as follows:

- N14 - Links Mogale City with North West Province and Tshwane MM
- R28 - Links Mogale City Local Municipality and Randfontein
- M18 - Links with N14
- R563 - Links with N14
- M36 - Mobility with Krugersdorp
- R24 - Links Mogale City with Rustenburg

The main freight route, within Mogale City, includes the N14, R28, and R24 which carries significant traffic of heavy vehicles per day in and out of Mogale City. **Table 12.15** indicates the road condition in Mogale City.

Table 12.15 - Mogale City Road Conditions by Road Type

MOGALE CITY LOCAL MUNICIPALITY				
Mogale City	Segment	Length of Roads (km)	Condition of Roads	Comments
Primary routes	215	93.6	Fair to Good	Keep up maintenance
Secondary routes	509	85.5	Fair to Good	Keep up maintenance
Main Tertiary routes	487	72.3	Fair to Good	Keep up maintenance
Tertiary routes	3,811	568.2	Fair to Poor	Keep up maintenance
Total	5,022	819.6		

In spite of the length of the primary, secondary, main tertiary and tertiary routes that are under the jurisdiction of Mogale City Local Municipality, the 2010 Pavement Management System results show that, the Mogale City Local Municipality to keep the road network in a fair to good condition by instituting a strict maintenance regime policy.

Table 12.16 reflects the Paved Road Condition as per Visual Condition Index (VCI) for all roads within the Mogale City LM and also indicates the road lengths within various ranges of the VCI.

Table 12.16 - Paved Condition of Mogale City Roads

Very Good	Good	Fair	Poor	Very Poor
26%	35%	23%	12%	3%

Based on the above table and from the inspections we carried out, the following can be reported:

- The road network is in a fairly good condition despite lack of continuous maintenance program due to inadequate funding.
- There are more roads in good and very good conditions in the Krugersdorp area compared to the Rietvallei due to the type of development.
- Mogale City Local Municipality has a higher percentage of very good and good roads despite the unpaved roads problems around rural areas of the municipality.
- There are pockets of poor roads and pot holes but these are being dealt with as funds become available.

(c) Randfontein

There is National and Provincial roads providing mobility and access function to the West Rand district municipalities. These are as follows:

- N14 – links Randfontein with Northwest and Tshwane MM
- R28 – links Randfontein, Westonaria and Sedibeng LM in Gauteng
- M13 – links Randfontein with Johannesburg through Soweto
- R41 – links Randfontein to Northwest
- R559 – links Randfontein with Southern Soweto

The main freight route, within Randfontein, includes the N14 and R28 which carries significant traffic of heavy vehicles per day in and out of Randfontein. **Table 12.17** indicates the road condition in Randfontein. South Africa has had an unusually rainy season in the 2008/09 year and thus the majority of the roads in Randfontein are in a state of very poor condition. There is a need to control the load on heavy vehicles as well as to create a road dedicated to heavy vehicles. This will be able to slow down the rapid rate of road deterioration. Randfontein Local Municipality needs to develop road maintenance and upgrading programme in order to minimise the further destruction of the road surface and structure.

Table 12.17 - Randfontein Road Conditions by Road Type

RANDFONTEIN LOCAL MUNICIPALITY										
Road Network	CONDITION OF THE SURFACING					CONDITION OF THE STRUCTURE				
	Very Good	Good	Fair	Poor	Very Poor	Very Good	Good	Fair	Poor	Very Poor
Class 3: minor arterials	18%	22%	19%	19%	14%	41%	44%	4%	6%	5%
Class 4a: Connector Roads (CBD areas)	27%	27%	18%	18%	1%	68%	23%	7%	0%	3%
Class 4b: Connector Roads (Residential areas)	33%	20%	19%	19%	1%	65%	29%	4%	1%	0%
Class 5: Access roads	27%	39%	9%	9%	1%	63%	35%	2%	0%	0%
Total Network	26%	32%	14%	14%	4%	59%	35%	3%	1%	1%

Table 12.18 reflects the Paved Road Condition as per Visual Condition Index (VCI) for all roads within the Randfontein LM and also indicates the road lengths within various ranges of the VCI.

Table 12.18 - Paved Condition of Randfontein Roads

Very Good	Good	Fair	Poor	Very Poor
26%	32%	24%	14%	4%

Based on the above table and from the inspections we carried out, the following can be reported.

- It is urgent that the PMS be updated to reflect the current status as this helps in planning for projects and budgets.
- The road network is in a fairly good condition despite lack of continuous maintenance program due to inadequate funding.
- There are more good roads in Randfontein than they are poor roads.
- Randfontein has a higher percentage of very good and good roads despite the storm water problems around Toekomsrus Township
- There are pockets of poor roads and pot holes but these are being dealt with as funds become available.

(d) Westonaria

There are two National and Provincial roads providing mobility and access function to the Westonaria Local municipalities. These are as follows[)]:

- N12 - the east-west route linking Gauteng and the West Rand
- R28 - links Westonaria and Randfontein

The main freight route, within Westonaria, includes the N12 and R28 which carries significant traffic of heavy vehicles per day in and out of Westonaria. **Table 12.19** indicates the road condition in Westonaria.

Table 12.19 - Westonaria Road Conditions by road type

WESTONARIA LOCAL MUNICIPALITY										
Road Network	CONDITION OF THE SURFACING					CONDITION OF THE STRUCTURE				
	Very Good	Good	Fair	Poor	Very Poor	Very Good	Good	Fair	Poor	Very Poor
Class 3: minor arterials	44%	15%	31%	11%	0%	77%	21%	1%	0%	0%
Class 4a: Connector Roads (CBD areas)	36%	33%	25%	6%	0%	81%	16%	3%	0%	0%
Class 4b: Connector Roads (Residential areas)	37%	31%	19%	9%	4%	72%	22%	3%	0%	4%
Class 5: Access roads	31%	39%	25%	5%	0%	74%	25%	0%	1%	0%
Total Road Network	34%	34%	25%	6%	1%	75%	23%	1%	0%	1%

Although the road condition of the structure seems to be very good, without quick intervention, the condition could deteriorate. The unusual weather change in South Africa is also a factor that has impact on the road surface and structure in the district and Westonaria in particular. The uncontrolled movement of heavy vehicles and the lack of overloading control should be attended to.

Table 12.20 reflects the Paved Road Condition as per Visual Condition Index (VCI) for all roads within the Westonaria LM and also indicates the road lengths within various ranges of the VCI.

Table 12.20 - Paved Condition of Westonaria Roads

Very Good	Good	Fair	Poor	Very Poor
34%	34%	25%	6%	1%

Based on the above table and from the inspections we carried out, the following can be reported:

- It is urgent that the PMS be updated to reflect the current status as this helps in planning for projects and budgets.
- The road network is in a fairly good condition despite lack of continuous maintenance program due to inadequate funding.
- There are more good and poor roads in Bekkersdal Township compared to the Simunye Township due to the incomplete Bekkersdal Renewal Project (BRP)
- Westonaria has a higher percentage of very good and good roads despite the storm water problems around Simunye Township

There are pockets of poor roads and pot holes but these are being dealt with as funds become available.

12.7 Municipal Road Network Planning and Priorities

12.7.1 City of Tshwane

The areas where the Ward Committee meetings called for upgrading of the major roads are of interest. These were, without exception, in the affluent residential areas and followed two general patterns. In the north, demands for additional road capacity tend to be associated with those wards which are impacted by the building of major toll roads (N4 and N1). These include Weavind Park, Montana, Sinoville and Waverley to the east and the Orchards area to the North West. In the south the areas adjacent to the N1, including Rietvlei, Irene and Rooihuiskraal, called for major road upgrading.

There is only limited access to the north of Tshwane caused by the physical barrier, the Magalies Mountain. The accesses are indicated in **Figure 12.16**.

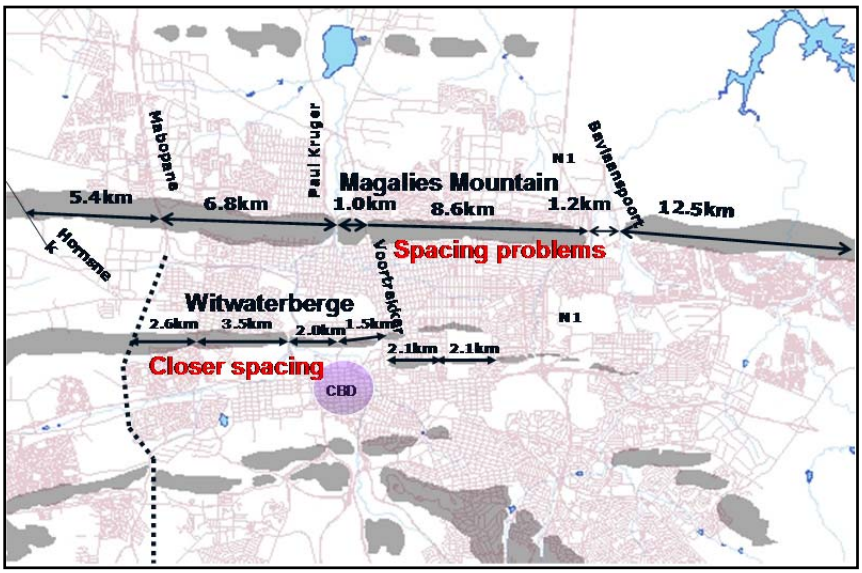


Figure 12.16 - Points of Access through the Magaliesberg

The total traffic on the nine roads (15 lanes) represents 83.5% (18500 Car Passenger Units-CPU) of the total road capacity (24200 PCUs). It is expected that the traffic demand will increase to 39800 PCUs (97%) within the next 15-20 years.

Given the expected demand and the possibility to increase the number of lanes across the mountain by 5 lanes per direction, the overall demand will exceed the supply within the next 10 to 15 years, as shown in **Table 12.21**.

Table 12.21 - Existing and Future Capacity Utilisation

	NORTHBOUND			SOUTHBOUND		
	2004	Increase	Future	2004	Increase	Future
Number of road links	9	1	10	9	1	10
Current/ Available lanes	14	6	20	15	5	20
AM Peak hour vehicles	12,100	5,600	17,700	18,500	18,000	36,500
Average lane utilisation	860	930	890	1,230	3,600	1,830
Equivalent Car Passenger units	13,200	6,200	19,400	20,200	19,600	39,800
Capacity	22,800	10,800	33,600	24,200	9,400	33,600
Percentage lane utilisation	57.9%		57.7%	83.5%		118.5%

Table 12.22 is a list of roads projects for the Province.

Table 12.22 - Projects of Provincial Responsibility

Project Name		Est. Cost (Million)
1	New K97 link (N4 southwards)	R 90.0
2	K14 link (part of area road network development for regional inter-modal facility, which includes the Paul Kruger Street Extension upgrading and re-alignment)	R 60.0
3	Upgrading of Rietvlei Dam Road (as K54) (R21 to Delmas Road)	R 20.0
4	One carriageway of K54 (Garstfontein Road to Delmas Road)	R 32.0
5	Upgrading of Rietvlei Dam Interchange (R21)	R 20.0
6	Doubling of Old Johannesburg Road (K101, from Wawiel Interchange/Eeufees Rd to M31 in the south)	R 70.0
7	Second carriageway of Hans Strijdom East (K69) (from Atterbury Road to Genl Louis Botha Drive)	R 45.0
8	Second carriageway of Hans Strijdom East (K69) (from Lynnwood Road to Mamelodi)	R 50.0
	TOTAL	R 387.00

Note: The PWV 9 is not included in this list, due to the cost estimate exceeding R1.2 billion (previous best estimate). It is a project of its own significance, and is very strongly emphasised in the City Development Strategy (CDS) as important for development in Tshwane. However it is also included in the Gauteng (Toll Freeway Improvement Scheme of SANRAL), and may thereby even become a national project.

The local roads projects included in the summary do not reflect the total backlog that needs to be addressed, but focuses on the more important projects within the areas. The approach to backlog eradication needs to be refined, particularly regarding minimum standards and packaging of projects in such a way as to make a noticeable, significant impact on an area at a time. Thus projects to improve local roads will gain in more

significance and specific budget allocation in due course. The spending on local roads is indicated in **Table 12.23**.

Table 12.23 - Summary of Local Road Projects per area

Geographic Area	Cost (Million)
Akasia	R 4.55
Atteridgeville	R 1.25
Ga-Rankuwa	R 3.2
Mabopane	R 48.40
Mamelodi	R 29.95
Temba/Hammanskraal	R 92.35
Soshanguve	R 13.85

The current main road projects within CTMM address the construction of new links as well as upgrading the capacity of major roads. Projects on the capital budget include:

- Menlyn area road network, including a proposed interchange on the N1 at Garstfontein Road and major expansion of the existing Atterbury Road as well as cross-streets. (The scheme is developed in partnership with SANRAL and the local business community)
- Extend Nelson Mandela Drive (From Edmond street to Soutpansberg Road)
- Doubling of Simon Vermooten Road (between Alwyn Road and N4): To improve accessibility of Samcor Park/Waltloo to the freeway network. This upgrading is supportive of freight movements and an automotive facility.
- Doubling of a portion of Stormvoël Road from Hans Coverdale to Simon Vermooten Extension
- Extension of Derdepoort Avenue to link Stormvoel Road to Zambezi Drive via portion of existing Baviaanspoort Road
- Improving of Hans Strijdom Drive West (P36 Delmas Road up to R21 interchange)
- Doubling of Lynnwood Road (Rubida St to Hans Strijdom Drive)
- Doubling of Church Street (East) over railway line

(a) Strategic Road Network

The Tshwane Strategic Road Network Plan is shown on **Figure 12.17**. It shows the current road network master plan indicating the existing and planned class 1, 2 and 3 road links. The planned road network also includes the important missing link to the west of the CBD, which is the planned north-south PWV9 freeway, as well as the activity spine/street(s) for this corridor.

(b) Completion of the Tshwane Mobility Ring (PWV 9)

The extension of the PWV9 Freeway southwards to create the Western Bypass of Tshwane, will open up a North-South axis for the flow of people and goods. Such a developmental corridor will draw investors who would like to capitalize on the mostly untapped development potential of the western reaches of the City. This attractive location will be close to the capital core, and will be linked to its southern decentralized nodes and the Zone of Choice. At the same time it will complete the Tshwane Mobility Ring (N1, N4 West; PWV9 and N14).

The PWV9 mobility link has been planned to cater for between 5000 to 7000 vehicles per hour, with a cost benefit ratio of more than one (for all scenarios) and the annual economic benefit exceeds R1,2 billion (in 1999 Rand). The extension of the “Mabopane Freeway” across the Magaliesberg creating a link with the old N4 (PWV1), Atteridgeville and further south with Centurion, Midrand, Randburg and Sandton will unlock the Zone of Choice and give it better provincial-wide accessibility.

A major emphasis is at present being placed on enabling the construction of the link through Daspoortrand. A study has been initiated to implement tunnels rather than a massive cutting, as this is more environmentally acceptable (visual impact, severance of communities, noise etc.).

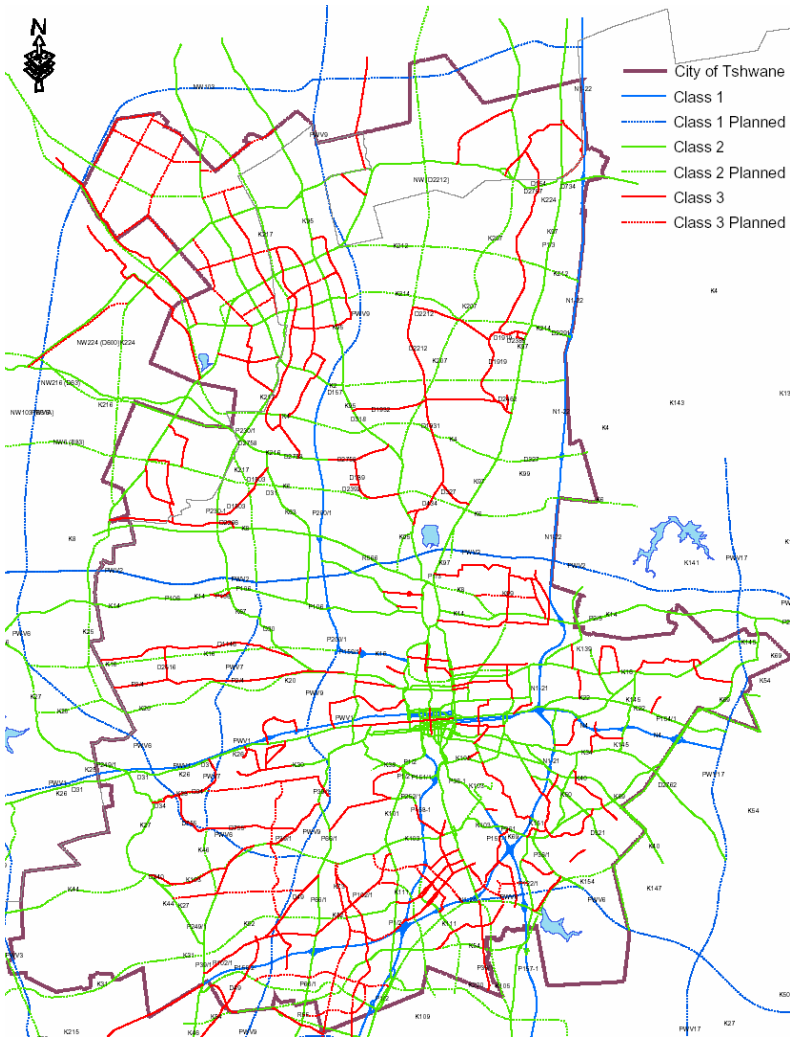


Figure 12.17 - CTMM Interim Strategic Road Network

(c) Planning Projects of a Strategic Nature

There are a number of strategic roads projects. The strategic planning projects include:

- K99 link - Zambezi Drive southwards across the Magaliesberg Mountain to link to the bulk of the area to the south. The alignment options include the road link going south-west (Frates Road and hence towards the CBD and Sunnyside) or south (Codonia Street and onwards to Hatfield). This is a very important link, as it provides only the third north-south option to cross the physical barrier of the mountain. Due to the high cost of this link including tunnelling options, the feasibility as a toll route is being investigated.
- Olievenhoutbosch Road Activity spine (Development and construction of the East section and West section, since the central section already constructed as single carriageway). As indicated above, it is related to the N1 corridor.

- Proposed Rooihuiskraal Road interchange on N14 and regional linkages. An interchange on the N14 freeway at the current Rooihuiskraal Road crossing, as well as new link roads such as the proposed Lenchen Avenue Extension, will improve accessibility of the quadrants and possibly relieve pressure on the Old Johannesburg Road.

(d) Transport lead projects

The City of Tshwane has identified the following lead transport projects:

The K8

The improvement of the K8 and its further extension south of Wonderboom Airport via Third Road and Sakabuka Avenue to Moloto Road (K139), instead of bringing it into Zambesi Drive, needs to be considered seriously. This is necessary to act as a second east-west local spine:

- ensure adequate mobility,
- alleviate traffic on Zambesi Drive,
- give impetus to the further development between Zambesi and the N4, and
- reinforce the public transport network, by providing a road facility which could be developed in part as a high capacity public transport corridor

N4 - K97 Link to Rainbow Junction

The Zone of Choice will be further “opened up” and local access and mobility will be bettered by linking the Rainbow Junction Node with the new N4 toll road through the construction of the much needed K97. This link will also provide access from the N4 to Wonderboom Airport via Lindvelt Road.

K99 Link to the South (Dr Swanepoel Drive)

Similarly, the accessibility to and mobility within the Zone of Choice could be greatly improved by redeveloping Dr Swanepoel Drive, with a possible extension through the Magaliesberg to link up with Frates Avenue on the southern side of the mountain. However, the linkage to Frates will be a very expensive option and may not be viable in the short to medium term. It however lends itself to be developed as a metropolitan urban toll road. To this effect SANRAL has been requested to investigate such a possibility, taking into account that within Gauteng only SANRAL can currently develop toll roads.

12.7.2 City of Johannesburg

Salient findings in examining private (car) transport demands and current road network conditions regard are:

- Both within and outside the N1/N3/N12 Ring Road, roads are operating at low levels of service and many road sections are operating at capacity or at over-capacity conditions in peak hours.
- In addition to the above there are many congestion “hot-spots” at intersections and interchanges.
- In recent years little progress has been made with regard to promoting public transport nor has emphasis been given to furthering road development, and as a result most of the existing mobility spines have major traffic problems.
- The City has 1780 traffic lights and malfunctioning is a common problem due to rain, power cuts and power distribution faults, and many do not have correct signal plans. The estimated cost of correcting traffic signal cable and power distribution faults is R0,5bn.
- In terms of the objectives of the SDF on-going attention needs to be given to the upgrading/surfacing of gravel roads and looking after the maintenance and rehabilitation of existing road infrastructure.
- As a consequence of the above and in association with other interventions, which will be of a capital intensive nature, there is the need to embark upon travel demand management. (In this regard current initiatives are identified in the main report.)

It is evident that regardless if one is talking about roads within or external to the N1/N3/N12 Ring Road system, operating conditions in peak hours are poor, the prevailing Level of Service (LoS) on average, being LoS D. Further examination of the data does however highlight that many road sections are running at capacity (i.e. LoS E) and many at over-capacity conditions (i.e. LoS F).

While the present work programme for the ITP has not progressed to the stage where there is a comprehensive data base available which would enable one to undertake a detailed assessment of interchange / intersection performance, the following information is relevant:

- While there are a few exceptions, most interchanges are congested during peak hours. The demand to use the freeway / motorway system is such that there are long queues on roads which provide access to the freeway system and long queues on the off-ramps of the freeway system, many of these tailing back onto the freeway lanes

themselves. Both of this point to the fact that interchange capacity is a serious problem and that the capacity of interchanges is not consistent with that of neither the adjacent freeway nor the routes which provide access to the freeway network.

- While the existence of the freeway system improves accessibility and mobility, it also needs to be remembered that freeways present barriers which need to be crossed. Both in terms of cross access and access to the freeway system itself, various problems are evident, some of these being related to double loading (i.e. cross traffic and traffic accessing the freeway system being concentrated on one route) and the different access standards applied to the freeway system (i.e. access and interchange spacing requirements on the M1 & M2 as opposed to those on the N1 & N3).
- With respect to intersections, there are some 1820 traffic signal controlled intersections in the CoJ and problems with traffic lights receive substantial media attention.

Key interventions identified by the City of Johannesburg directly applicable on transport planning are the following:

)

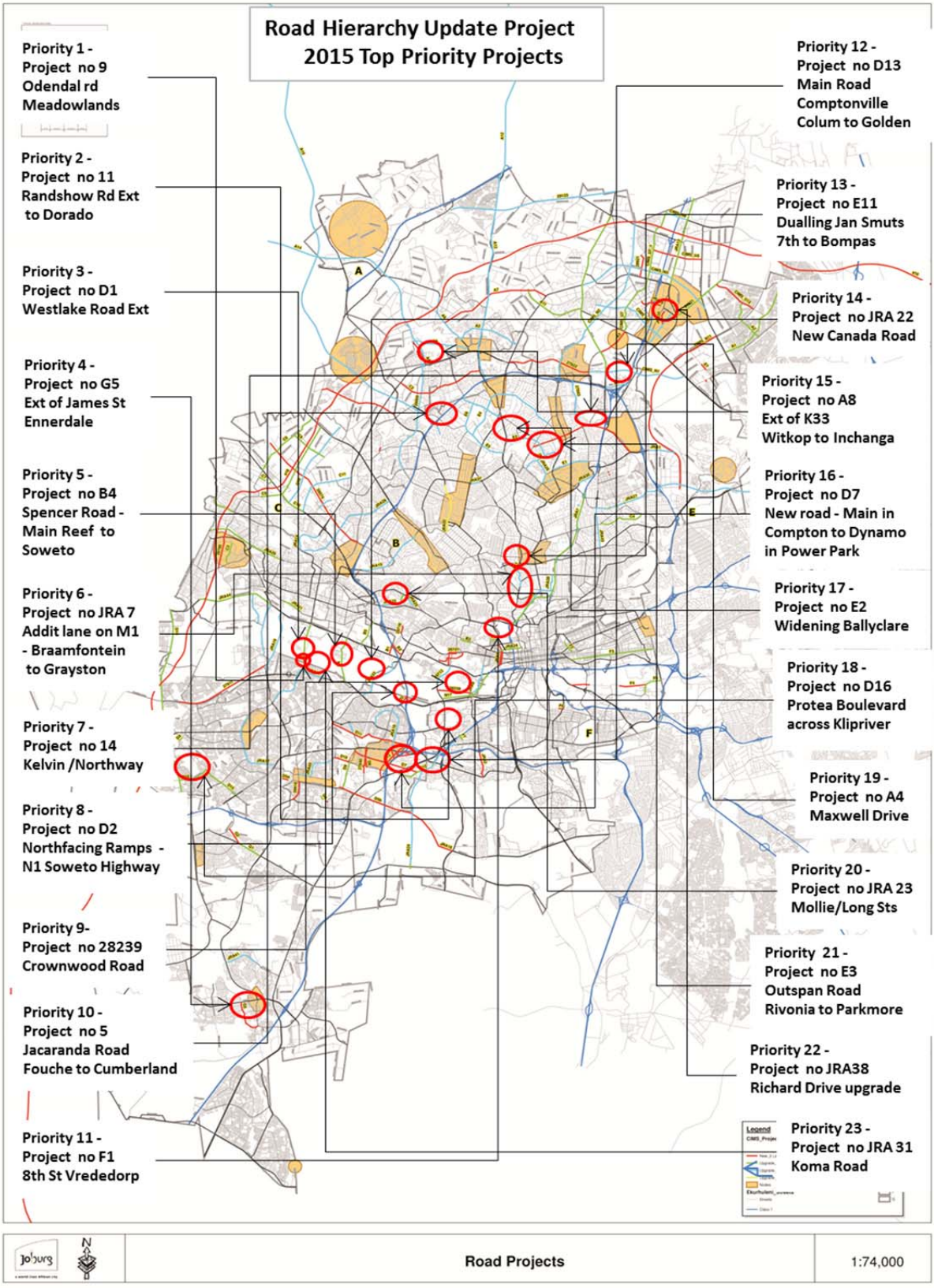
- Kazerne Precinct
  - Construction of Vickers – Heidelberg link road
  - Upgrade of Maraisburg interchange
- City Deep Trade Port Precinct
  - Rosherville Rd extension to lower Germiston Rd
  - Bonsmara Rd Upgrade
  - Heidelberg Rd Upgrade
  - Lower Germiston Rd upgrade
  - Vickers-Heidelberg loop road
  - The Cleveland Road Link extending Cleveland Road through to Lower Germiston Road
  - The westward extension of Rosherville Road through to Vickers Road
  - Local upgrading of Lower Germiston Road in the vicinity of Jupiter
- Market Precinct
  - Heidelberg – Vickers loop service road
  - Vickers Rd upgrade
  - N17 on/off ramps
- Heriotdale Precinct
  - M2/Main Reef / Cleveland interchange upgrade
- George Goch Precinct
  - Vickers – Paullus Rd link

- Rosherville Precinct
  - Cleveland Rd extension and N17 interchange
- Construction of the N17 and extension of the M2 westward;
- Construction of north-south linkages such as Nic Tolmey Road Extension, Westlake, Spencer and Cemetery Road Extension;
- Construction of the K102 linking the K15 on the west and north towards Roodepoort; and
- Development of transit-orientated focal points that provides inter-modal facilities at key points such as the Roodepoort Station.
- Construction of the K60 should be supported to serve as an alternative mobility corridor from Woodmead Drive to William Nicol Drive;
- Upgrading of William Nicol and Rivonia interchanges with N1 and the portion of William Nicol from Montecasino to the N1;
- Improve access onto Nasrec Road and Main Reef Road;
- Investigate dangerous Kingsway/University Road intersection and improve;
- Proposed access to University of Johannesburg at Twickenhan Avenue;
- Improve functioning of Artillery Road to improve access and parking during peak periods;
- Establish and promote strong east-west linkages with specific reference to: Traffic management in Gleneagles Road, Greenhill Road, Tana Road and Victory Road in support of east-west mobility links.
- Traffic management strategy and urban design for Sixth Street, including traffic calming;
- Explore connectivity links between Moira Street in Cosby and Hamilton Road in Coronationville;
- Develop Randburg Regional Node as a destination by altering mobility patterns to and through the Node:
  - Close Hendrik Verwoerd Drive between Selkirk and Jan Smuts Avenue.
  - Reopen Hill Street (between Kent Avenue and Pretoria Avenue) to vehicular traffic.
  - Upgrade Pretoria Avenue to facilitate public transport and pedestrian access.
  - Develop a new taxi rank on site bounded by Retail Avenue, Hill Street, Pretoria Avenue and Oak Avenue and integrate with the flagship SPTN.
- Improve road access from Riverlea to Main Routes such as the extension of N17, Nasrec Road; and
- Determine the alignment and implementation programme for proposed major arterials such as the PWV 3 and PWV 5;
- Construct the new Westlake Extension Road;

- Upgrade Randfontein Road and intersections with specific reference to passing lanes, pedestrian crossings, informal trade, signage and traffic and transport management (including taxi's);
- Support main Reef Road as an economic corridor in the EWDC;
- Realign and upgrade the existing New Canada Road;
- Realign and upgrade Spencer Road;
- Upgrade and realign Dobsonville Road, with reference to the N17 and K102;
- Construction of N17, Golden Highway;
- Construction of north/south linkages to maximise integration with northern regions;
- Upgrading of K43 to improve accessibility;
- Construction of K102 linking the K15 on the west and north to Roodepoort Road; and
- Determine the alignment and programme proposed for the K122
- Construct the proposed K60/k113 and PWV 3;
- Construct the proposed K60/K111/K113/K115/K232;
- Proposed interchange to be constructed at the intersection of Main Road and the N1 Highway;
- Undertake measures to improve mobility and relieve congestion on Woodmead Drive between the M1 interchange and Woodlands Drive;
- Upgrade and improve the following routes to increase linkages and integration thus reducing isolation of Alexandra: Vasco da Gama – Far East Bank, London Road, Grayston Drive/Watt Avenue/Roosevelt Road, Corlett Drive-Ninth Road, Wynberg – Canning Road;
- Upgrade the N3 interchanges at London Road and Marlboro Drive;

A Functional Road Hierarchy was developed for the City of Johannesburg for the Base Year and 5 and 10 Year Horizon, and as part of the study identified the priority roads projects in the City of Johannesburg for 2015 and 2020 which are indicated in **Figure 12.18**, and **Figure 12.19**.

Figure 12.18 – COJ 2015 Priority Roads



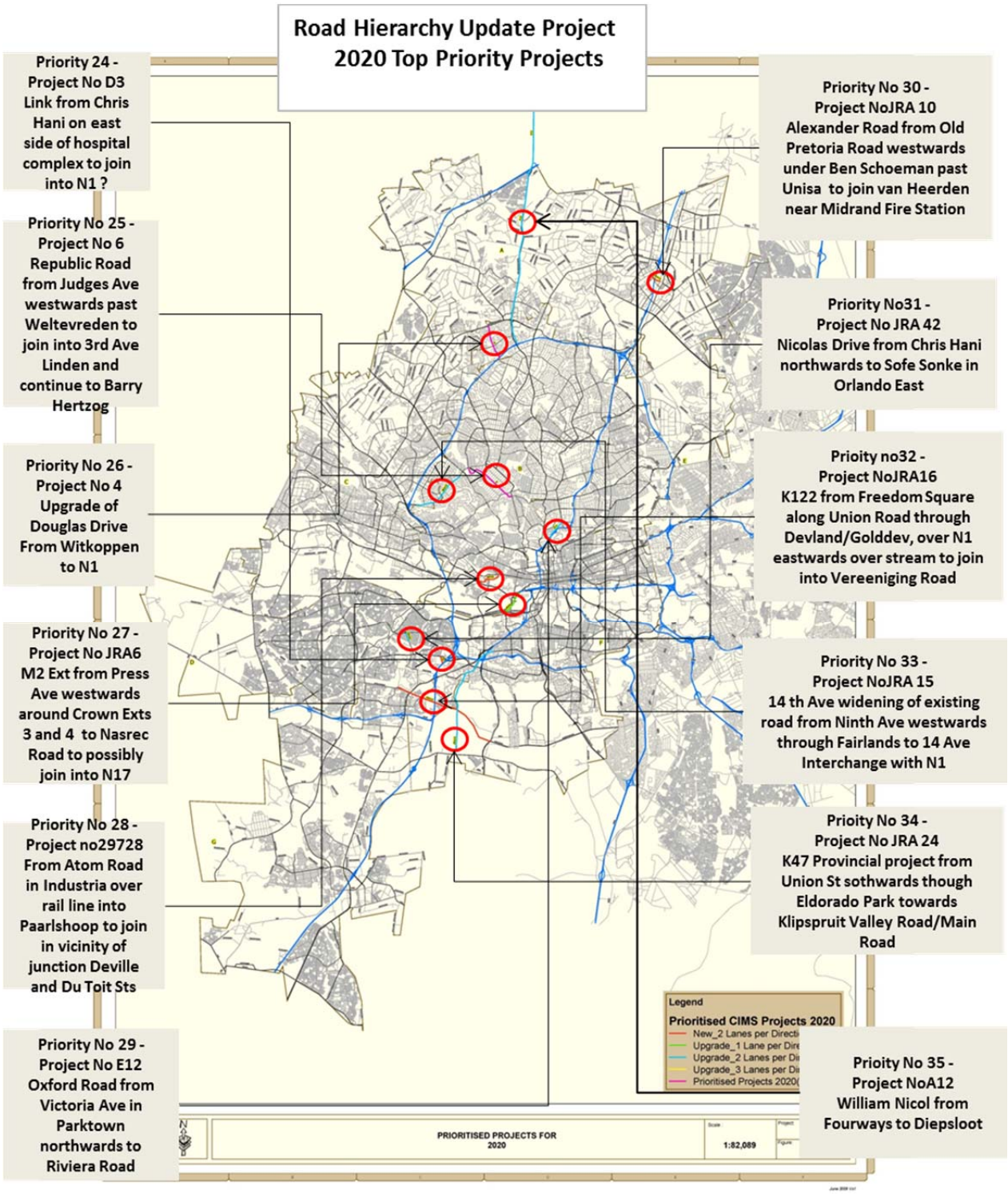


Figure 12.19 – COJ 2020 Priority Roads

12.8 Ekurhuleni Metropolitan Municipality

Levels of service E and F on a road network indicate a high level of congestion. Only 7.2% of roads experience a level of service E and another 3.5% level of service F. The congestion index for all roads in Ekurhuleni is considerably lower than in either Johannesburg or Tshwane is indicated in **Figure 12.20**.

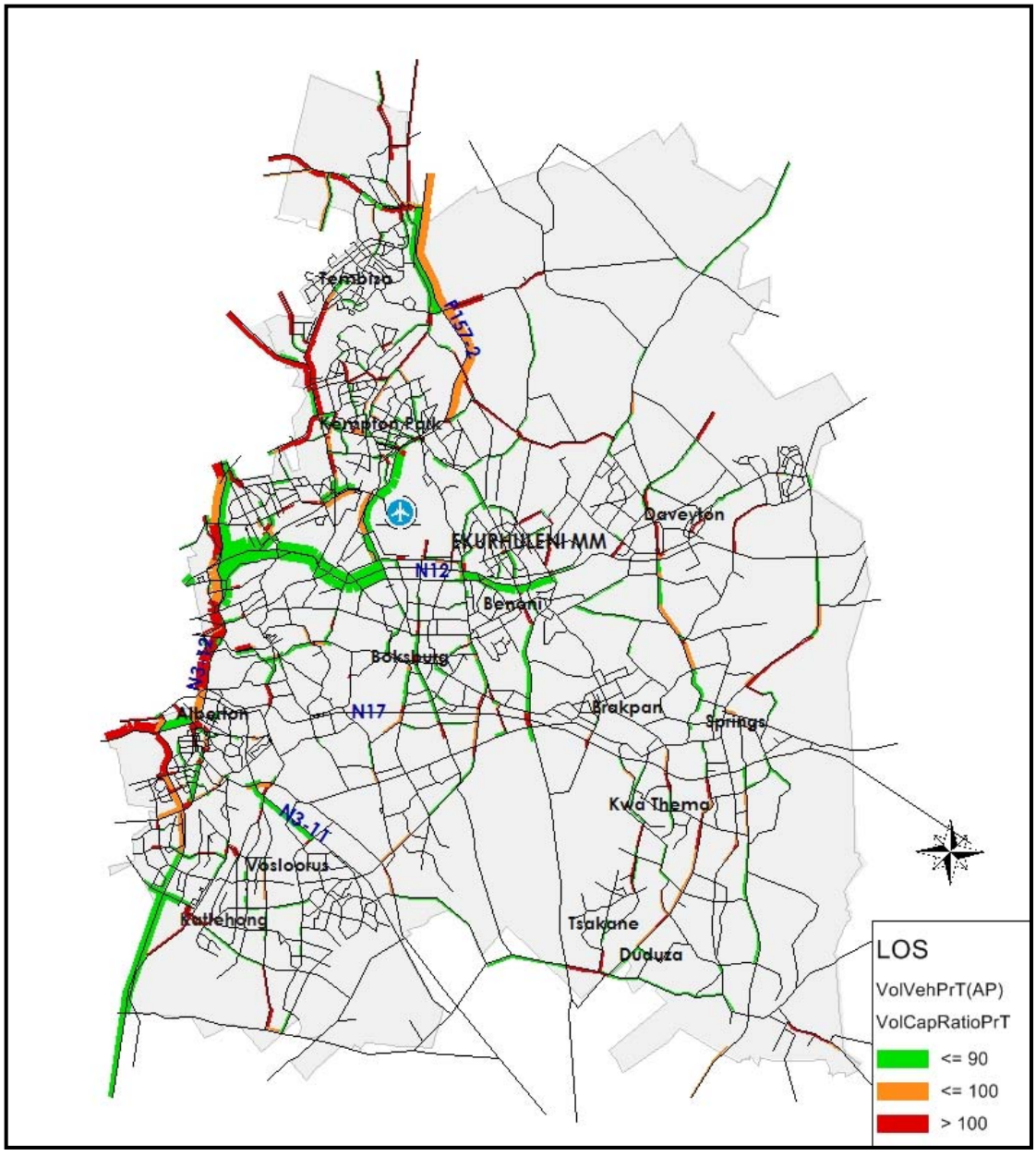


Figure 12.20 - Predicted Levels of Service (LOS) in 2010

The proposed capital expenditure budget for major roads infrastructure in Ekurhuleni is given in **Table 12.24**

Table 12.24 - Ekurhuleni Metropolitan Municipality – Road Projects

Project	Estimated	Proposed	Budget Years (2007 R million)					
	Total Cost	Start Year	1	2	3	4	5	>5
	(R million)							
NEW ROADS INFRASTRUCTURE:								
K115 (M59 Driefontein Rd/Lunik Drive extension) from K155 (Modderfontein Rd) to M16 Brabazon Rd	38.4	2008	5.76	8	12	12.64		
K146 (Rivett-carnett St extension) from M7 (Kliprivier Drive) to D817	71.76	2008	11.76	11	15	14	20	
K86 from K157 (M43 Atlas Rd) to P67-1 (R51 Putfontein Rd) - second phase by GDPTRW	74	2008	11	11	15	17	20	
K89 (M61 Vereeniging Rd) from Delphinium St to Potgieter Rd	7.8	2010			7.8			
K92 (M52 Van Buuren/North Reef) from M97 Nicol Rd to K113 (M37 A.G. de Witt Rd)	21.36	2010			3	18.36		
K121 (Dann Road) from K105 (M57 Pretoria Rd) to Van Riebeek Rd	34.62	2010			3.62	20	11	
K68 (Vermeulen St) from P67-1 (Du Randt Road) to Esselen St	15.24	2010			2	13.24		
K117 from Tinney Rd to 0.8 km North	2.4	2011				2.4		
K117/K127 from North Reef Rd to Webber Rd	76.92	2011				8	40	28.92
K132 (R554 Springs Rd extension) from Glamorgan Ave to M56 South Main Reef Rd	69.72	2012					40	29.72
K60 from M18 Andrew Mapheto Rd to K105 (M57 Pretoria Rd)*	82.2	2012					40	42.2
UPGRADING OF GRAVEL ROADS:	(Including external funding)							
Northern Region	757	2008	81	81	81	81	81	352
Southern Region	757	2008	81	81	81	81	81	352
Eastern Region	757	2008	81	81	81	81	81	352
PUBLIC TRANSPORT: HOV LANES								
Tembisa - Kempton Park	85	2008	9	20	20	20	16	
Katlehong – Germiston	85	2012					9	76
Vosloorus – Boksburg	80	2008	9	20	20	20	11	
R23 from R554 Dalpark - Benoni	35	2012					5	30
Daveyton – Benoni	95	2008	9	20	20	20	26	
TOTAL	3145.42		299	333	361	409	481	1263

Here it is important to note that EMM is obliged to ensure SARTSM compliance of all road signs and traffic signal installations by 2010. The estimated cost of this work was sourced from a previous report "Development of a traffic signal control strategy for the Ekurhuleni Metropolitan Municipality" in 2005. Tenders have already been advertised for the execution of this work. The total annual capital expenditure resulting from these proposals amount to:

- Year 1 R390 million
- Year 2 R422 million
- Year 3 R442 million
- Year 4 R475 million
- Year 5 R529 million

The proposed road infrastructure construction programme as identified by the Ekurhuleni Metropolitan Municipality is given in **Table 12.25**.

Table 12.25 - EMM proposed road infrastructure construction programme

Road	From	To
By 2010		
K115 *	K155	Brabazon Rd
K146	817	P72-1
K121	K105	van Riebeeck Rd
K89	K133	K124
K124	K89	K125
K155	Kwartel Rd	K119
K60 *	A Mapheto	K105
K89	Delphinium St	Potgieter Rd
K86	K157	P67-1
K132	Springs Rd	South Main Reef Rd
K105 *	781	K121
K92	Nicol Rd	K113
K68	P67-1	K86
K68	Elm St	K105
By 2015		
K117	Tunney Rd	0.80 km north
K117/K127	North Reef Rd	Webber Rd
By 2020		
K27	R21	K151
K94	Elizabeth Rd	Atlas Rd
K161	Stone Rd	Paul Kruger Highway
K125	N3	Wits Rifles Rd
K62	K27	K169
K169	P6-1	Geldenhuys Rd
K163	Main Reef Rd	Koot Rd
By 2020		
K113	Meyer St	A G de Witt Rd
K109	K27	P6-1
By 2025		
K92	North Rand Rd	Sarel Hattingh St
K105	Andre Greyvenstein Av	North Rand Rd

Note: * - Assumes that section of road outside Ekurhuleni is constructed

Roads with only a short section in Ekurhuleni were not included, e.g. K113, K111

12.9 West Rand District Municipality

12.9.1 Merafong City

This specific section for the Merafong City Local Municipality was not completed as the funding for implementation and maintenance was captured in their annual budget. **Table 12.26** reflects the needs as indicated in the District IDP document for the period 2010/11.)

Table 12.26 - Merafong Local Municipality – Road Projects

PROJECT	ESTIMATED BUDGEY	SOURCE OF FUNDING
Upgrading of existing roads	R10 million	Not reflected
Upgrading of existing storm water	R5 million	Not reflected
Construction of walkways	R3 million	Not reflected
Khutsong 1,2,3 Construction of new road	R10 million	Not reflected
Road bridge over rail	R18 million	Not reflected
Rehabilitation of current services in old Khutsong Ext 2 and 3. Loading zones along taxi routes.	R52 million needed as part of resettlement plan	Not reflected
Resealing of roads	R6,8 million	MIG grant
Speed calming	R500 000	MIG grant
Construction of roads (Losberg Area)	R6,5 million	MIG Grant
Kokosi Ext 5 Road Construction	R50 000 000	MIG
Kokosi Ext 6 Road Construction	R25 500 000	MIG
Wedela Road Construction	R20 000 000	MIG
Kokosi Ext 5 Ring Road Construction	R1 000 000	MIG savings
Construction of new taxi rank Wedela	R5 386 159	MIG
Construction of new taxi rank: Blybank	R5 386 159	MIG
Construction of new taxi rank: Kokosi	R5 251 504	MIG

The following roads have been planned for the Merafong City LM by the provincial Gauteng Department of Public Transport Roads and Works (GDPTR&W) for the near future:

- K211 – Links Carletonville with N14
- K213 – Links Carletonville with Fochville
- K140 – Links MCLM with to the East Merafong LM
- PWV18 – Links Merafong City LM with North West and the City of Johannesburg
- Metropolitan Municipality (CoJMM)

12.9.2 Mogale City

Table 12.27 reflects the road needs as indicated in the District IDP document for the period 2010/11:

Table 12.27 - Mogale Local Municipality – Road Projects

PROJECT	ESTIMATED BUDGET	SOURCE OF FUNDING
Road Construction: Kutlhanong Road Rehabilitation / Rietvallei Ext 2 and Rangeview Ext 2	Not reflected	Own funding
Construction of rural roads	Not reflected	MIG
Access roads to Ethembalethu Village/ Rietfontein Village	Not reflected	MIG

The following roads have been planned for the Mogale City LM by the provincial Gauteng Department of Public Transport Road and Works for the near future:

- K74 – Links Mogale City with City of Johannesburg MM
- K11– Links Mogale City with Randfontein LM
- K17 – Links Mogale City with North West Province
- K76 – Links Mogale City with North West Province
- K15 – Links Mogale City with Soweto
- PWV12A – Links Mogale City with City of Johannesburg and North West Province
- K198 – Links Mogale City with City of Johannesburg MM and Randfontein LM

12.9.3 Randfontein

Table 12.28 reflects the needs as indicated in the District IDP document for the period 2010/11:

Table 12.28 - Randfontein Local Municipality – Road Projects

PROJECT	ESTIMATED BUDGET	SOURCE OF FUNDING
Road Master Plan	R 1,2 million	Not reflected
Rehabilitation of bridge structures	R800 000	Not reflected
Implementation of freight movement and overloading control	R800 000	Not reflected
Reconstruction/rehabilitation of primary roads and arterials	R700 million	Not reflected
Construction of K11 by pass	R55 million	Not reflected
Construction of road over rail and road bridge (Arend Drive Extension)	R85 million	Not reflected

The following roads have been planned for the Westonaria LM by the provincial Gauteng Department of Public Transport Road and Works (GDPTR&W) for the near future.

- K11– Links Randfontein with Westonaria LM and Mogale City LM
- K197 – Links Randfontein with Mogale City LM
- K96 – Links Randfontein with PWV12A
- K198 – Links Randfontein with City of Johannesburg MM
- PWV1 – Links Randfontein with Mogale City LM and Westonaria LM.
- PWV16 – Links Randfontein with City of Johannesburg MM

12.9.4 Westonaria

Table 12.29 reflects the needs as indicated in the District IDP document for the period 2010/11:

Table 12.29 - Randfontein Local Municipality – Road Projects

Project	Estimated budget	Source of Funding
Simunye Internal Road upgrading and construction	R 3 390 347	Not reflected
Construction of new Taxi Rank in Westonaria	R200 000	Not reflected
Resurfacing of roads: Westonaria	R500 000	Not reflected
Walkways : Extension Simunye	R200 000	Not reflected
Walkways: Upgrading Westonaria CBD	R100 000	Not reflected
Walkways: Upgrading Glenharvie	R400 000	Not reflected

The following roads have been planned for the Westonaria LM by the provincial Gauteng Department of Public Transport Road and Works (GDPTR&W) for the near future:

- K9 – Links Westonaria with K156 and PWV18
- K11– Links Westonaria with to the North Randfontein and to the South Sedibeng LM
- K140 – Links Westonaria with to the West Westonaria LM
- K170 – Links Westonaria with Sedibeng to the south
- K142 – Links Westonaria with to the West Westonaria LM and to East Johannesburg MM
- PWV1 – Links Westonaria with the rest of WRDM

12.10 Road Network Planning in Sedibeng District Municipality

The major strategic future roads in Midvaal are:

- PWV 13: A major north-south road running from Benoni and Boksburg through Midvaal linking up with the proposed PWV 22 in the south.
- PWV 18: A major east-west road running along the northern boundary of Midvaal. This road will connect the East Rand and the West Rand and traverses the R59 freeway.
- PWV 20: A major east-west road running through the south of Midvaal and traversing the R59 freeway.

The existing road network provides good connectivity between the north and south of Midvaal, but there is a lack of proper east-west connections at regional level. The most significant routes at a regional level include:

- The N1 national route running from Cape Town to Musina.
- The N3 national route between Durban and Johannesburg. This route runs through Midvaal in the east.
- The Golden Highway (R553) being a major north-south route which runs parallel to the N1 in the west of Sedibeng and past Sebokeng and Evaton.
- The R59 north-south route which links Alberton and Vereeniging and runs through the east of Midvaal past Meyerton.
- The R82 north-south route which links Johannesburg and Vereeniging via Walkerville and De Deur in the west of Midvaal.
- The K89 being a secondary route running parallel to the R59 linking Alberton and Vereeniging through Meyerton. This was the main route until the R59 freeway was constructed.
- The R42 being an east-west route which links Meyerton with Heidelberg and the N17 in Ekurhuleni.
- The R551 being an east-west route between the N1 and the Suikerbosrand Nature Reserve. This road merges with the R42 at the Nature Reserve.
- The R550 being an east-west link between the N3, R59 and R82.
- The R54 which links Vaal Marina in the south of Midvaal with the R82.

Route K89 runs more or less parallel to the R59 freeway and will thus in future act as an Activity Spine which will unlock the development potential of the land parallel to the east of the freeway in future. As this was originally the only road through the area, most of the land uses occurred along this road and front onto this road. Route K89 has lower mobility than the R59 freeway, but higher accessibility through more intersections and direct access at spacing intervals of about 600 metres. The upgrading of the current road to the standards of a K route will however have the effect that no direct access to land uses will be possible from this road in future. The construction of an additional lower order (third and fourth order)

road network around the corridor to supplement the K89 and provide direct access to land uses along the R59 freeway will thus be required. Nevertheless, the significance of the K89 must be aligned with the Strategic Road Network study.

Due to the high development pressure experienced in the area, there is currently an initiative underway to design a third and fourth order road network for the R59 Corridor and surroundings. This work is still in progress, and involves extensive discussions with representatives from GDPTRW.

The important principles relevant to the R59 Corridor illustrated in **Figure 12.21,** are**:**

- the fact that a third order route, parallel to the west of the R59 freeway, will be required in future in order to unlock the development potential of land to the west of the freeway (similar to K89 to the east of the freeway);
- the need for local east-west crossings across the R59 freeway between the interchanges in order to separate regional and local traffic and to enhance interaction between future land uses to the east and the west of the freeway;
- The westward extension of a third order road network from the R59 freeway in order to enhance future east-west movements.

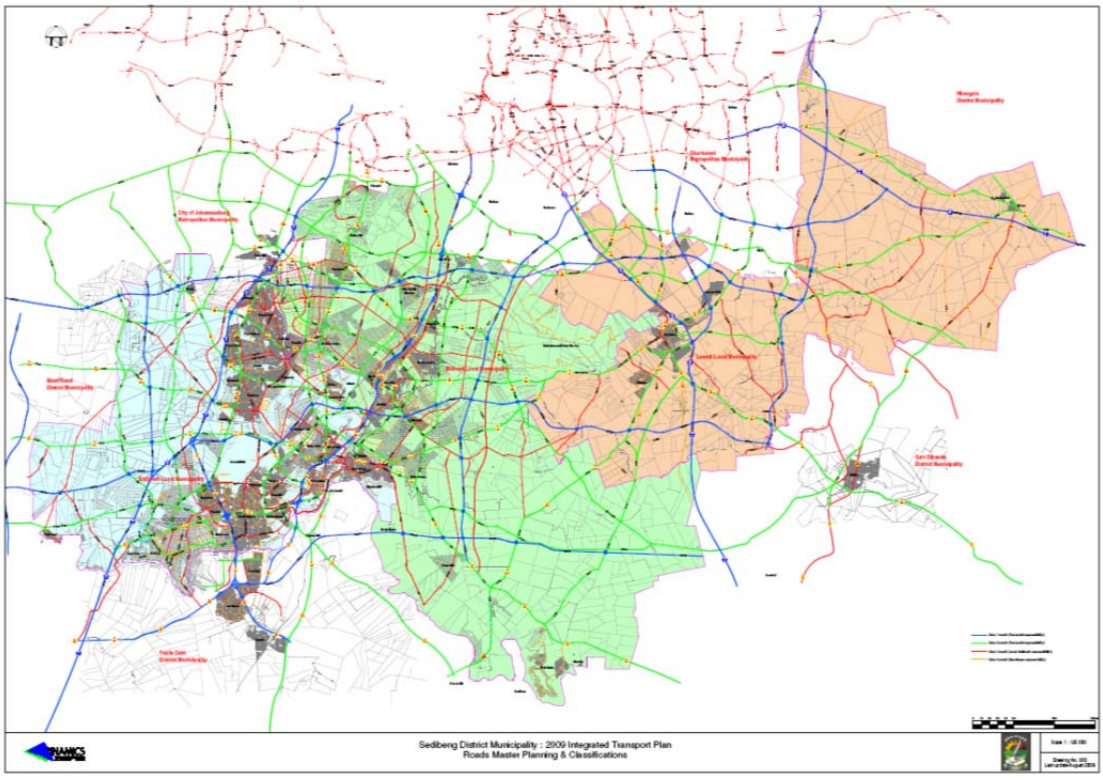


Figure 12.21 - Sedibeng Road Master Plan

12.11 Road Network Realities Problems and Issues

Considering the evaluation of the planning documents and the current status of the road network in the Gauteng Province the following overall conclusions can be made:

- The broad road network planning are in place In Gauteng and the Gauteng Strategic Road Network Plan provides structure to the development of the province
- The Strategic Road Network Plan has to a large extent been taken into account in the road master planning undertaken by both SANRAL, the Metropolitan and District/Local Municipalities i.e. there is a general cohesion with regard to road planning between the three spheres of Government
- The current road planning is an extremely valuable element to enable economic growth in Gauteng.
- Available road reserves may be utilised differently than originally anticipated i.e., emphasis on integrated transport corridors where public transport and non-motorised transport plays a more important role than private cars.
- Due to a lack of funding the Gauteng Department of Transport and the Metropolitan, District and Local municipalities implicitly rely on SANRAL to implement the mobility/freight backbone road network of which i.e. GFIP Phase 2 & 3 is the prioritised road network needed.
- Funding is a major constraint – SANRAL relies on toll financing to finance the Gauteng Freeway Improvement Scheme (Phase 1-3). The GDRT funding for the development of new roads and the upgrading of existing roads is limited at approximately R500 million per year with the bulk of their funding going towards road maintenance. Similarly the Metropolitan, District and Local Authorities again relies on both SANRAL and the Province to upgrade and provide the new higher order (Class 1 and 2) road infrastructure in their respective jurisdictions.
- Developer contributions must be addressed by all the planning authorities in the Province

12.12 Catalytic Road Network Projects

12.12.1 Introduction

Considering the evaluation of the planning documents and the different priorities given to the sections of the road network by all tiers of government the following road projects has been identified as important projects that are catalytic in nature and that would unlock and stimulate growth and thus job opportunities in the Gauteng Province:

12.12.2 Tambo Springs Road Accessibility

The Cabinet has approved the Presidential Infrastructure Coordinating Commission's (PICC's) second *"Infrastructure Implementation Plan"* report, which includes a framework outlining an integrated management and delivery system for the 17 Strategic Infrastructure Projects (SIPS) across all three spheres of government. Over the coming three years, some R845-billion has been budgeted for public infrastructure projects and the PICC, which is chaired by President Jacob Zuma, has been established to support the delivery of the projects.

The second SIP is an initiative to improve the movement of goods through the Durban-Free State-Gauteng logistics and industrial corridor by prioritising a range of rail and port improvements, supported significantly by a R300-billion investment programme by Transnet over the coming seven years.

The Tambo Springs Hub is one of the projects associated with the Durban-Free State-Gauteng Logistics and Industrial Corridor as one of the major freight hubs on the Gauteng side of the corridor. The following short term road projects are directly associated with Tambo Springs and is critical to provide the road accessibility to the Tambo Springs Freight Hub:

- Detail design of the K148/N3 interchange at a cost of R25m.
- Construction of K148/N3 interchange will commence in year 2013 when detailed design is completed.
- Detail design and EIA of K148, K146 and PWV15 – Cost of R60m.

The roads that are required to improve the accessibility to Tambo Springs and the proposed phasing are shown in **Figure 12.22**.

It can be seen that the construction of PWV 18 between the N3 and P156/2 (R59) is listed as Phase 3.

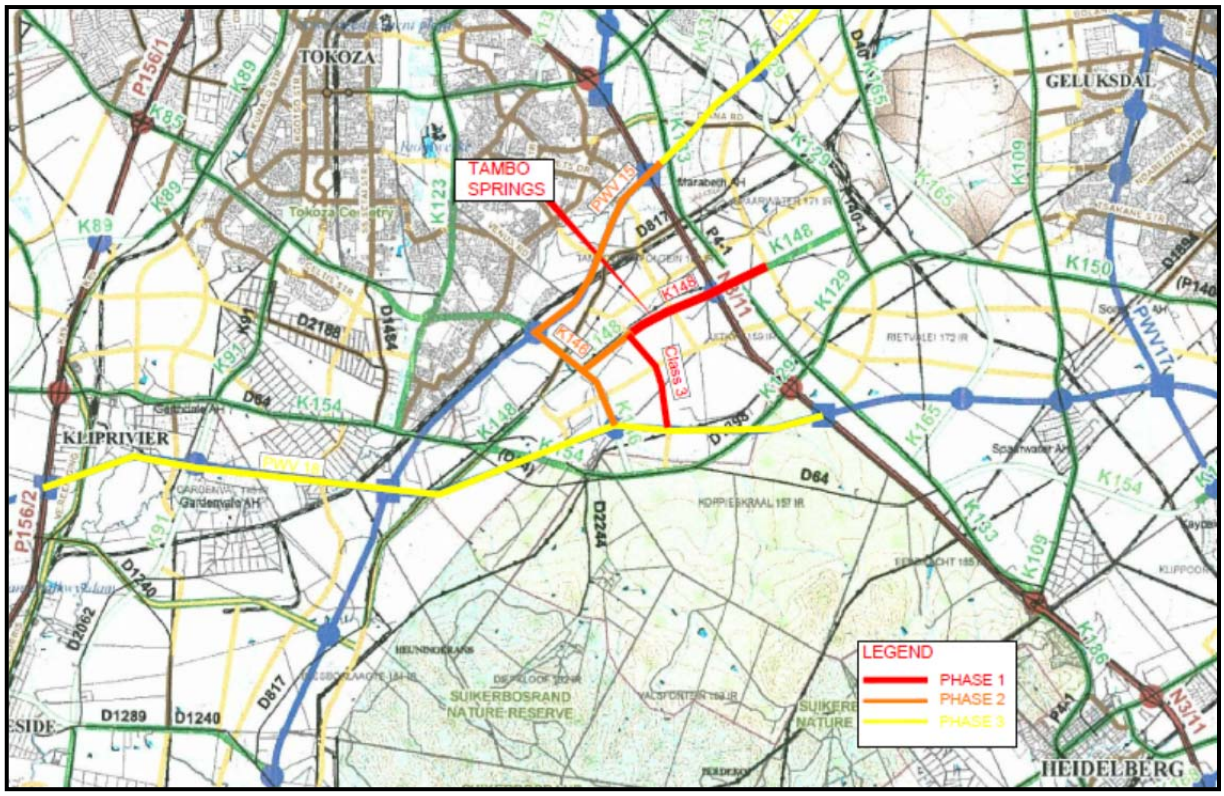


Figure 12.22 - Tambo Springs Proposed Road Network Upgrading

12.12.3 PWV 18

The Gauteng Spatial Development Framework (2010) highlights the need to create a concentric functional road link in the southern parts of Gauteng Province.

The purpose of this is to connect the emerging new node at Kagiso-Chamdor-Leratong to the proposed new activity node along the N1 south at Ennerdale/Grasmere; from where the disadvantaged communities of Orange Farm, Ennerdale and Evaton can have a functional link and access to the new activity node along route R59 at the Klip River/Waterval Business Node. This section also creates an effective east-west link between the N1 south and R59 freeways.

From the R59 at the Klip River Business Park the new link should extend northwards where it will serve the Kathlehong-Tokoza-Vosloorus communities, link to the N3 freeway, N17 and N12, and eventually link up with the emerging OR Tambo Aerotropolis in Ekurhuleni, and the R21 development corridor as indicated in **Figure 12.23.**

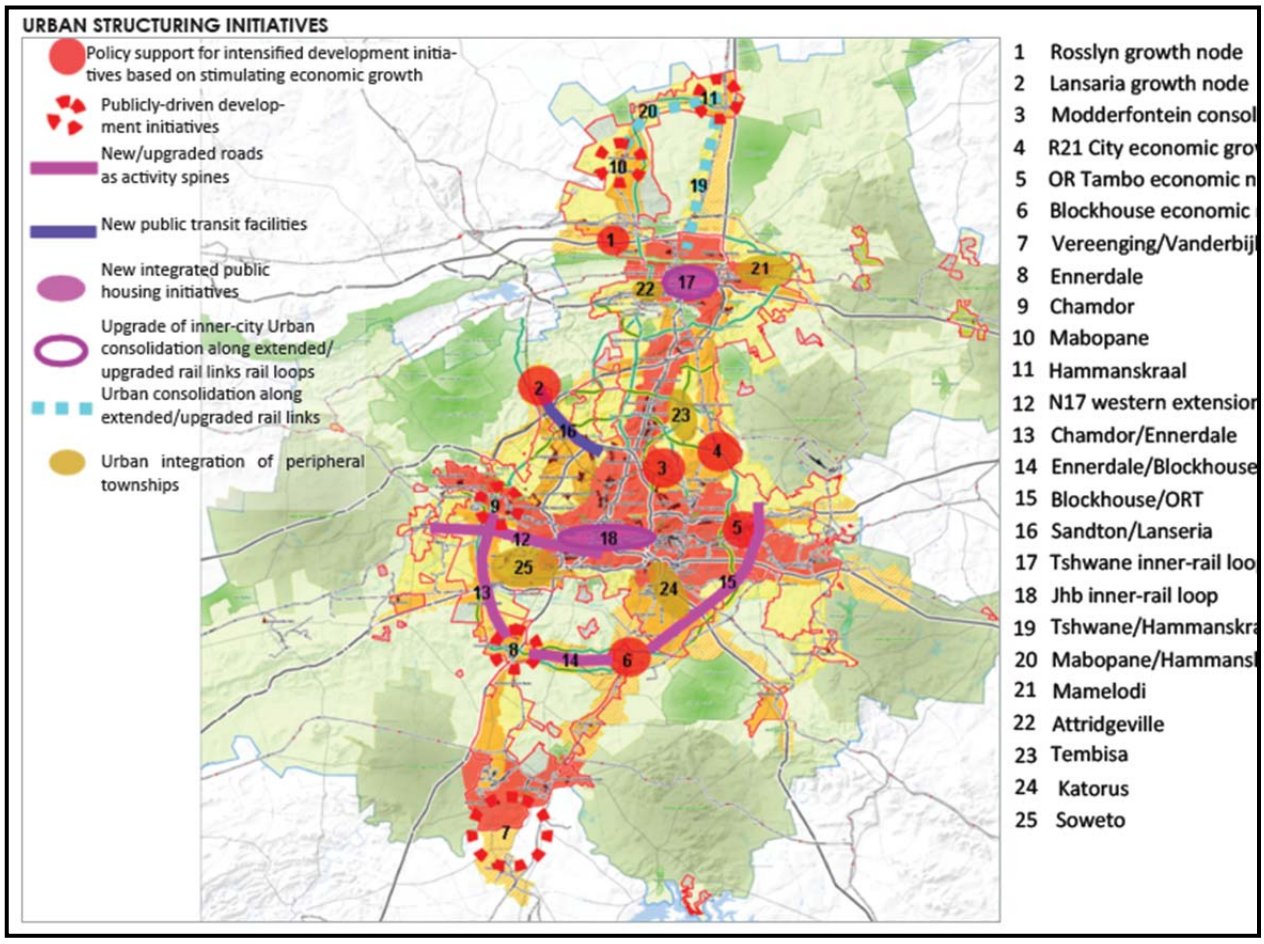


Figure 12.23 - Gauteng Urban Structuring Initiatives

Apart from serving several large concentrations of disadvantaged communities, this link also connects several freeways/development corridors as well as a number of existing and emerging activity nodes located in the southern parts of Gauteng Province to one another, effectively enhancing the development potential of these areas.

It is envisaged that sections of routes PWV5 (south), PWV18, PWV13, and/or PWV17 could be considered to create this link.

The Gauteng Freight Implementation Strategy (GFIS) was developed to assess the state of freight in the province and develop an intervention strategy to ensure alignment of the provincial freight strategy with the national freight and logistics strategy.

The Freight Strategy identified key interventions areas that will address logistic inefficiencies in the logistic system. These interventions were preconditions to manage

freight without constraining economic growth in the province. The interventions are also informed by freight demand volumes which are expected to increase from 210 million tonnes to 415 million tonnes by 2020.

The PWV 18 is also seen as a crucial link from a freight point of view as the PWV18 between the N3 and the N1 is an east-west link, linking three major north-south corridors i.e., the N1, the R59 and the N3 and will thus improve accessibility from Tambo Springs to Vereenging/Van der Bijlpark via the R59 and to Klerksdorp/Potchefstroom via the N1.

It is thus recommended that the detail design of the PWV 18 be undertaken.

12.12.4 GFIP Phase 2

The need for the implementation of the proposed further phases of the GFIP road is essential to reduce the logistics cost of the province and to provide the road infrastructure required for the optimal functioning and growing of the province.

Irrespective of whether the freeway road network will be funded through Road User Charges or through the normal fiscus it is important that the detail planning and Environmental Impact Assessment of the following roads be undertaken to be able to start with construction when funding is available.

It is thus recommended that between the Provincial Government and SANRAL the detailed design and EIA of the following road links be undertaken, as listed in **Table 12.30**.

Table 12.30 - GFIP Phase 2 Road Network

Road	Description : detailed	Km	Estimated Project Costs (R million)	GFIP – Phase 2
PWV 9 North	(R80/P159-1 to N14/P158-1)	29.41	4 118	2/3
PWV 9 South	(from the N14/P158-1 to N1)	18.12	2 537	2
PWV 5 East	(between PWV 9 and R21)	21.00	2 940	2
PWV 17	K54 to N4	4.00	560	2
K54	(R21 to PWV 17)	25.00	3 500	2
N17west	N1 to Soweto (PWV 5)	15.30	2 142	2
PWV 14	N12(Rietfontein I/C to M2(Refinery Road I/C)	11.75	1 645	2
	TOTAL	124.58	17 442	

13 NON-MOTORISED TRANSPORT

13.1 State of NMT Planning in the DOT

13.1.1 DOT Draft NMT Policy, 2008

The Non-Motorised Transport Policy document provides a single framework and an enabling environment for the Department of Transport, other government departments and stakeholders to address the challenges inherent in NMT.

The primary objectives of this NMT policy are:

- Increase the role of NMT as one of the key transport mode;
- Integrate NMT as an essential element of public transport;
- Provide a safe NMT infrastructure; and
- Allocate adequate and sustainable funding for the development and promotion of NMT.

NMT will be provided on the basis of a number of principles including the need to improve a quality of life, energy conservation and safety. This policy articulates various responsibilities of all stakeholders involved in the provision of NMT as mode of transport in order to ensure that NMT provision is rendered in an appropriate manner.

The DOT is the custodian of this policy and is responsible for regulation, funding, communication, infrastructure, planning, socio-economic benefits, monitoring and evaluation of overall national NMT policy. The Department is also responsible for the review of this national NMT policy in consultation with provincial Departments of Transport and other relevant stakeholders.

The policy articulates and recognises the main facets of NMT as animal-drawn transport, cycling, walking and innovation solution.

Provincial Departments of Transport are responsible for managing the implementation of NMT provision in their respective provinces, planning (in consultation with key transport stakeholders), identifying beneficiaries, law enforcement and ensuring road safety (together with Local Government), capacity building, communication, and monitoring services. In terms of planning, the policy requires that NMT plans must be developed and integrated

into the Provincial Land Transport Framework (PLTF), as well as in the Integrated Transport Plans (ITP) of Local Government.
The policy also prescribes institutional arrangements, governance, regulatory and legislation aspects of NMT. Also the regulation, legislative review and update are required with immediate implementation of this policy.

The animal welfare and health need to be protected and with collaboration with Department of Agriculture to ensure that appropriate measure are in place. The policy also emphasise the need to provide infrastructure and the development of the NMT Infrastructure and Facility Guidelines. Further, it makes a recommendation for capacitating of local government by national and provincial Department of Transport. The policy prescribes the need to provide criteria for funding the implementation of the policy.

It also ensures that NMT plays a role in economic development, poverty alleviation and empowerment of the marginalised groups. The policy prescribes the need to train drivers and operators and performance of safety audits as way to promote safety. The impact of NMT on the environment is addressed by the need to respond to environmentally suitable animal transportation. The policy prescribes the need to promote NMT as a feeder mode to other mode of transport.

The policy prescribes the need to develop minimum standards and specifications of NMT vehicles in taking cognisance of safety. The policy provides the implementation framework that outlines the indicators for monitoring and evaluation, requirement of training programs for drivers and learners, and promotion of NMT.

13.1.2 DOT Shova Kalula Bicycle Programme

The DOT developed a bicycle implementation strategy to advance the aspirations of the citizens to actively participate in social and economic life. It is anticipated that the promotion and provision of bicycle transport services would facilitate mobility for shorter distances at an affordable cost and would decrease the travel time. Furthermore, the provision of appropriate bicycle infrastructure and ongoing maintenance of the bicycles and bicycle tracks play a critical role in safeguarding the lives of the users. It is also important that complementary measures are implemented as outlined in the roll-out plan to ensure that the project is sustainable.

Statistics issued by Statistics SA as well as the findings of the National Household Travel Survey (2003) have confirmed that the rural poor have little or no access to public transport.

This situation tends to perpetuate the level of isolation from the economic mainstream and as a result exacerbates the extent of poverty and underdevelopment.

In 2001, the Department introduced Shova Kalula as a pilot project with the aim of improving rural accessibility to education resource centres. In October 2005, the Minister of Transport undertook to accelerate the provision of bicycles by delivering 1 million bicycles by 2010. To give effect to this goal, the Strategic Plan 2007 – 2010 outlined the delivery targets set for the Department to roll out 60,000 bicycles during the 2007/2008 financial year, 200,000 during 2008/2009 and 500,000 during 2009/2010 financial year.

The primary focus is currently on supplying bicycles to learners who meet the set qualification criteria. Beneficiaries of the project will be expanded to include women, farm workers and other vulnerable groups in the community. The implementation plan spells out key strategic activities to be undertaken in achieving the set goal. Targets, performance measures and timeframes have been indicated in streamlining bicycling into the broader transportation system.

The responsibilities of the Provinces for the Shova Kalula program are as follows:

- Facilitate the implementation and proper control of the projects, by facilitating integration with other sectors;
- Determine projections for the short, medium and long–term rollout plan and allocate resources adequately;
- Monitor and ensure performance as per service level agreements with the respective service providers, partners and schools;
- Ensure that a coordinating mechanism with the stakeholders is in place and managed properly; and
- Ensure that identification plates are mounted on Shova Kalula bikes for promotional and security purposes.

The Department of Transport is mandated to liaise with town planners and the Department of Public Works on better planning and use of public space, such as using the road reserve for sidewalks, cut kerbs for cycle ways, bicycle parking facilities in selected areas, etc.

Further, the Provinces and Municipalities were mandated with the development of public awareness programmes and links with school campaigns.

13.1.3 DOT Public Transport Strategy, 2007

According to the DOT Public Transport Strategy, relevant matters with regard to NMT include:

- Multi-modal integration

  The network will consist of a core of road and rail trunk corridors with feeder systems. The aim is to achieve maximal physical and fare integration in the core. **Physical integration implies a well designed transfer system with high quality public space and pedestrian and wheelchair friendly movement between corridors and/or modes.**

  In addition to the core services, integration with the pedestrian precinct environment, bicycle feeder networks, metered taxis, motorised two and three wheelers, long distance public transport terminals as well as park-and-ride lots for car users, will ensure a range of flexible options that will extend the convenience of using the network and will also serve to attract new users.

- Access for Special Needs Users

  The legacy will see that the core network (both road and rail corridors as well as their precincts and stations) is 100% accessible to wheelchair users and others with special needs such as the blind and deaf. In addition, the design of the space at the stations, terminals and on the vehicles should be user friendly and child friendly. Special Needs User organisations will form part of the network advisory planning and monitoring team.

- Access for Learners

  The core urban and rural public transport, walking and cycling networks will aim to link schools and communities as part of the mainstream service plan. Where required, special services can be supplied and will be contracted and monitored in line with the core system.

13.1.4 DOT National Scholar Transport Policy, 2009

Various studies such as the National Household Travel Survey (NHTS), the Nelson Mandela Foundation's study on Rural Schooling and the Review of the Financing, Resourcing and Costs of Education in Public Schools have highlighted the difficulties that

scholars are facing. The studies suggest that the ability of scholars to access education is hampered by the long distances involved, threats to safety, as well as the cost of scholar transport. Scholars have difficulty accessing educational institutions because of the unavailability of scholar transport. The absence of a national policy on scholar transport has resulted in fragmented provision of scholar transport services administered by the Provincial Departments of Education and, Transport. Consequently, the amount of funding made available for scholar transport varies and is often insufficient to meet the existing need. The operationalisation and management of scholar transport has also taken different forms in the various provinces.

The following are some of the relevant findings of the NHTS:

- The vast majority of scholars (76% or about 11,4 million) usually walk to school. While almost all scholars walk to school in the rural areas and more than 70 percent walk to school in urban areas, little more than half of those in metropolitan areas walk to school.
- A third of the scholars in metropolitan areas travel by either car or taxi, while a fifth of those in other urban areas also use these modes. Buses have some patronage in metropolitan and other urban areas, but trains are very seldom used. Other forms of transport (bicycles, motorcycles, metered taxis, trucks, tractor-trailers or animal transport) are also rarely used.
- Some 25 percent of primary scholars who walk to school (1,7 million) walk for longer than 30 minutes in one direction. Considering all children who walk to school, there are 560 000 who spend more than two hours per day walking to and from school
- It is evident that cost alone does not determine patronage of public transport by scholars, but that other factors, such as availability, accessibility, travel time, safety, security and comfort certainly play a role in their choice of mode.

  From the above, it can be seen that distances to schools and back, unsafe roads, security and the cost of transport, are amongst the factors that serve as barriers to scholars accessing schools. This is the case especially for those scholars residing in rural areas. There is an urgent need, therefore, for the DOT to respond to these challenges facing scholars.

13.1.5 DOT Pedestrian and Bicycle Facility Guidelines Manual, 2003

The Manual provides guidelines under a variety of topics. A listing of the topics is given in the list of contents. The Manual is divided into a number of main parts which are:

- Part A: Design controls important to the design of pedestrian and bicycle facilities. These controls include accommodating the needs of pedestrians and cyclists, safety concerns and basic characteristics of the pedestrian and cyclists.
- Part B: Pedestrian and bicycle crossings, either at midblock locations or at road junctions. Pedestrians and cyclists are at their most vulnerable when crossing roads and streets, and attention must be given to improving the safety of such crossings.
- Part C: Pedestrian and bicycle ways, including sidewalks, walkways, bicycle lanes and bicycle roads are very important facilities that can improve road safety.
- Part D: Pedestrian and cyclist amenities and support facilities that can improve the experience of walking and cycling. Aspects such as road lighting and traffic calming are addressed.
- Part E: Pedestrian and bicycle places where priority is given to pedestrians and cyclists, while vehicular traffic is discouraged.
- Part F: The planning process and considerations aimed at ensuring the successful provision of pedestrian and bicycle facilities.
- Various information including road traffic signs and markings used at pedestrian and cyclist facilities, as well as a bibliography of available literature on pedestrian and bicycle facility planning and design, are given in Appendices.

13.2 State of NMT Planning in the GDRT

13.2.1 Gauteng Pedestrian Management Plan, 1997

In the plan initiated in 1997 by the Gauteng Department of Roads, Transport and Public Works, the CSIR identified pedestrian hazardous locations on metropolitan, national, provincial and local roads in the Gauteng Province as follows:

National/Provincial roads

- N1 at Hammanskraal
- Golden Highway
- Sybrand van Niekerk Freeway

Tshwane MM

- Maunde Street in Atteridgeville
- Tsamaya Road in Mamelodi
- Van der Walt Street in Pretoria Central
- Seeiso/Ramakgopa Street in Atteridgeville
- Shabangu Street in Mamelodi
- Soshanguve

Johannesburg MM

- Main Reef Road at Princess Station
- Old Potch Road, Zone 6 in Soweto (at Baraghwana)

Ekurhuleni MM

- Khumalo Road in Tokoza

Pedestrian engineering Improvements have been introduced on most of the identified routes.

13.3 State of NMT Planning in the Municipalities

13.3.1 Ekurhuleni Metropolitan Municipality

(a) Ekurhuleni ITP, 2008

Ekurhuleni Metropolitan Municipality's transportation vision and transport needs are developed in a sustainable way, providing for business, industry, train, bus, taxi and car users, cyclists and pedestrians.

The efforts to improve mobility and protect the environment include favouring of walking, as a healthy, environmentally friendly way of getting around, especially in the CBD areas of the Municipality.

Pedestrian activity is concentrated around the township areas of Tembisa, Daveyton, KwaThema, Katlehong, Vosloorus, Tokoza, and the areas to the north of Duduza. These areas would present good candidate sites for improving pedestrian facilities. Most of the above areas are disadvantaged, with higher vehicle-pedestrian crash rates, especially in the areas with many children. In addition, car ownership is often lower. Pedestrian and cycling improvements, especially near major pedestrian generators in the area (schools, hospitals, community centres, malls and shopping centres), can help to reduce accidents and to provide access and mobility to people without cars.

Future transport planning should investigate the following NMT strategies:

- Create “pedestrian and cycle friendly” environments;
- Improve NMT safety;
- Integrate NMT planning with public transport planning;
- Control of latter, as effective public transport depends on people being able to comfortably access stations and stops; and
- NMT planning should be included as well along planned corridors.

13.3.2 Tshwane Metropolitan Municipality

(a) Tshwane NMT Master Plan, 2010

The City of Tshwane (CoT) NMT Master Plan addresses the needs for bicycle routes which can be incorporated into the DoT National Strategy. In the context of the CoT, emphasis is on cycling and walking as modes of NMT. Ultimately, all forms of NMT must include Specail Needs People (SNP), women with shopping trolleys, animal drawn vehicles, etc. The Master Plan includes also the status quo of NMT bicycle routes, NMT network and projects for implementation.

The CoT has made efforts in addressing NMT within its borders. There are peri – urban areas that still do not provide for the NMT users. Bicycle routes in some parts of the City, e.g. Akasia and Atteridgeville are not continuous. However,sidewalks have been implemented extensively in many areas of the City.

The study concluded with the following recommendations:

- Establishment of a Forum/NMT Unit in order to address issues of NMT and Universal Access within the City;
- Implement the recommendations with regards to the NMT Unit;
- Secure funding to implement some of the projects identified for implementation;
- Create awareness around the use of NMT, as a transport mode; and
- Develop the NMT Policy Document in line with the DoT’s Draft NMT Policy.

(b) Tshwane ITP, 2006–2011

In 2007, the City of Tshwane (CoT) compiled five Regional Spatial Development Frameworks (RSDFs) for the administrative planning regions of the metropolitan area. They all need to be inter-linked, and also to support the Tshwane Metropolitan Spatial Development Framework (MSDF), as well as the Tshwane City Development Strategy (CDS) and the Tshwane Open Space Framework (TOSF).

In promoting the greater use of public transport the CoT must develop a comprehensive transport strategy which must include pedestrian connections between nodes/hubs. These connections need to be separated from vehicular traffic and also need to follow the desire lines for pedestrians. In terms of the connections itself, materials can be used to ensure permanence and legibility.

The promotion of more trees for the environment must feature prominently in the pedestrian environment as well, as trees provide shelter and a good quality environment for pedestrians.

The public transport system must include an extensive effort to integrate the system with an array of other services, including feeder vehicles, pedestrian corridors, bicycles, metered taxis, pedi-cabs and private cars. It is thus of great importance to fully integrate all modes, especially integration between the road and rail services. The development of park-and-ride facilities, preferably on the outskirts of the city, will allow private car users to easily utilize public transport for the bulk of their travelling needs.
Chapter 7 of the ITP deals with Public Transport Corridors and also incorporates the needs of NMT users as indicated below:

"Important road-based public transport corridors apart from the MCDC and the Platinum Corridor are the Mabopane to CBD route, the Saulsville/ Atteridgeville to CBD route and Mamelodi to CBD route. One of the important components of these corridors is walking and cycling facilities.

(c) Tshwane Inner City Development and Regeneration Strategy, 2005-2006

The following aspects were identified as challenges in the Inner City Development and Regeneration Strategy:

- Need for a clear and unique Inner City identity;
- Attract high profile developments to the Inner City;
- Make provision for a range of housing opportunities, and not only for a single socio-economic group;
- Provide sufficient residential support facilities to carry the increasing permanent residential population;
- Provide tourism, entertainment and recreational opportunities for the local residents as well as visitors;
- Comprise a dedicated public transport system (an internal circulation system);

- **The Inner City must be made pedestrian friendly**;
- The Inner City needs sufficient public spaces (soft and hard) in keeping with its desired image as world-class capital city;
- Develop new parks and public spaces;
- **Safety must be one of the main priorities**; and
- A dedicated management structure must be put in place.

(d) Tshwane Household Survey, 2008

According to the CoT Household Survey, percentages of use of the NMT transport modes on an average weekday before 09h00 are given in **Table 13.1**. The percentages are presented per region in the CoT.

Table 13.1: Use of NMT modes in the CoT Region

Region	Central-Western (%)	Eastern (%)	North East (%)	North West (%)	South (%)	Tshwane (%)
Cycling	0.4	0.6	0.7	0.5	1.5	0.7
Walking	19.4	13.9	17.9	20.9	10.3	16.5

Although most people take less than 10 minutes to access public transport (11.8%), there are still some people who take longer to reach public transportation. More specifically, 8.1% take 10-20 minutes, 4.8% take 20-30 minutes, 2.8% take 30-40 minutes and 0.8% takes more than an hour. Surprisingly, the time pattern is similarly distributed across regions. Around 36.4% of people don't use the public transport at all. This may be an indication of the lack of options available to the residents which forces many to choose using private cars.

(e) Tshwane BRT

Travel patterns in the AM peak period are dominated by the work trips (35.2%), and school, college or university trips (43.7%). Mode split of these trips is 65% of motorised and 33.8% of non-motorised users.

The BRT stations will feature pedestrian access, bicycle parking, park-and-ride facilities (not at all stations), and rail-road interfaces where applicable.

(f) Tshwane SDF, 2007

In support of ***Initiative 7: Quality Public Spaces Programme*** of the CDS, the Tsošološo Programme attempts to create a liveable city that provides citizens with a high quality public environment in which people want to settle and invest. In order to successfully achieve this goal, a framework needs to be provided which is committed to ensuring that all citizens achieve a healthy and dignified living standard.

This comprehensive programme identifies the areas where investment must be concentrated so as to maximise the impact. These include the following:

- Centres – including town centres, neighbourhood centres and intersection nodes;
- Community facilities – such as libraries, clinics, vocational training centres, i.e. places where people converge;
- Linear spines of activity – premised on the fact that Activity Spines and the smaller scale Activity Street/Strip large volumes of clientele to the businesses located on the linear spine of activity it becomes evident that this trend will promote the development of SME's and entrepreneurs alike.
- Inter-modal interchanges – as a large volume of people rely on the public transport, the transport facilities must seek to improve on the dredge of daily commuting.

Coupled with areas to concentrate investment, it is important to explore critical elements of the public environment as these will form the tools for intervention. The Tsošološo Programme defines the critical elements of the public environment as being:

- Public Squares;
- Markets;
- ***Pedestrian Walkways***;
- Public Transport Routes and Stops;
- Public Art; and
- Green Structures - trees, gardens, landscaping and natural open spaces.

(g) Shova Kalula Master Plan

The City of Tshwane commissioned the preparation of a non-motorised transport masterplan that addressed the needs for bicycle routes which can be incorporated into the DoT National Strategy. In the context of the City of Tshwane, emphasis was placed on cycling and walking as modes of NMT. Ultimately, all forms of NMT must be catered for including Specail Needs People (SNP),

women with shopping trolleys, animal drawn vehicles, etc. The study indicated the status quo of what has been implemented for NMT bicycle routes in CoT. A NMT network was designed and projects for implementation identified.

The CoT has made efforts in addressing NMT within its borders. There is evidence of pockets of bicycle routes in some parts of the City, e.g. Akasia and Atteridgeville. Unfortunately, there is no continuity of these routes. Sidewalks have been implemented extensively in many areas of the City. There are peri –urban areas that still do not provide for NMT users. The study concluded with the following recommendations:

- The City must form a unit in the form of a Forum or a NMT Unit to addresss issues of NMT and Universal Access within the City.
- The City must look into implememting the recommendations for implementation with regards to the NMT Unit.
- The City must secure funding to implement some of the projects identified for implementation.
- The City must work towards creating awareness around the use of NMT as a transport mode.
- The City must look into developing a NMT policy document in line with the Department of Transport's Draft NMT Policy.

Cycle routes are to be constructed are indicated in **Table 13.2**.

Table 13.2: CoT Cycle Route Construction Plan

Desciption	Length of Bicycle route (km)	Cost estimate (R Mill)
Hammanskraal and Babelegi	26	7.8
Mabopane and Soshanguve	9	2.7
Wonderpark and Akasia	11	3.3
Claremont	10	3.0
Atteridgeville	12	3.6
Pretotora CBD and Sunnyside	19	5.7
Centurion, Olievenhoutbosch and Sunderland Ridge	28	8.4
Erasmusrand and Faerie Glen	25	7.5
Mamelodi East	23	6.9

13.3.3 Johannesburg Metropolitan Municipality

(a) Business Plan for the Improvement of Pedestrian Safety in Johannesburg, 2003

During the process of development of the Business Plan for the Improvement of Pedestrian Safety in Johannesburg, two projects were identified to kick-off the Gautrans funding incentive. These include reconstruction of Main Reef Road, near Princes Station, and Old Potchefstroom Road at the Baragwaneth Hospital.

Another 36 pedestrian hazardous locations with the highest number of fatalities were identified as an input to the National Pedestrian Strategy. These hazardous locations were marked on a street map in order to determine a suitable strategy to improve pedestrian safety. The hazardous locations were at two prominent clusters – one around the Inner City area and the other around Soweto. Of significance is that both these clusters fall within regions that have been identified in the SDF and other programmes for specific interventions, development and upgrading as part of a strategic intervention programme.

Therefore the Pedestrian Safety Co-ordinating Committee decided to follow the pedestrian accident cluster approach to identify pedestrian safety projects to launch the Johannesburg Pedestrian Safety Initiative. In terms of selecting specific projects it appears, on the basis of available information, that the Inner City cluster of hazardous locations mostly has solutions that require minimal physical measures and demanding more of the education and law enforcement components. The initial focus would be on projects in the Soweto cluster, as they request physical remedial measures, and they will be co-funded by Gautrans.

(b) Johannesburg Framework for NMT, 2009

This document aims to present a policy comprising a set of objectives and strategies to realise an improved NMT environment in Johannesburg. In addition, the document identifies key principles which determine the zones and routes that should be considered as priority areas for implementation of NMT infrastructure. The proposed routes and zones are only developed at a strategic conceptual level and do not include detailed route planning or local and neighbourhood networks. The NMT local and neighbourhood networks should be developed through the development of local area NMT network plans.

This document forms a framework, presented in the following paragraph, under which detailed network planning and financial modelling per area can be undertaken (as part of Phase II).

The vision is for Johannesburg to be a cycle and pedestrian friendly city where everyone has access to urban opportunities and mobility, walking and cycling should be the preferred modes for short distance and convenience related trips.
The primary objectives of the Framework are as follows:

- Establish a dedicated network of high quality pedestrian and cycling routes across the City;
- Establish pedestrian and cycling modes of transport as preferred modes for short distance and convenience related trips within the City;
- Increase the percentage modal split of cycling and walking as preferred modes of transport for travel to work and school trips;
- Facilitate access to the City for marginalised and low income communities;
- Integrate NMT modes with other strategic public transportation initiatives within the City including the Gautrain, Metrorail and BRT stations in order to enhance local feeder services and support the successful functioning and take up of public transport; and
- Promote increased access to educational institutions by NMT modes.

The secondary objectives of the Framework are as follows:

- Place NMT at the forefront of Congestion and Environmental Management plans within the City;
- Maximise the local economic development opportunities related to cycling;
- Maximise the tourism opportunities related to NMT (ecotourism) and meet the needs of the tourism sector;
- Promote the health and leisure aspects of NMT; and
- Maximise access to recreation networks in the City.

The main focus areas covered in the Framework are:

- ***NMT integration to support strategic transport projects such as:***
    - Bus Rapid Transit System (BRT/Rea Vaya) stations
    - Gautrain stations
    - SARCC Metrorail Stations
    - Shova Kalula Bicycle distribution programme
    - New and existing road upgrades
    - Major Taxi ranks and facilities e.g. Jack Mincer and Metro mall
- ***NMT integration with Strategic Development Projects*** **:**
    - 2010 World Cup Stadium precinct upgrades & park and ride facilities
    - Baralink – Orlando

- Alexander Renewal Project
- Inner City Strategies including Commercial Core Public Environment Upgrade
- Cosmo City

- ***NMT to release Economic Potential:***
  - Links to Tourist Sites
  - Job Creation
  - Links to Shopping Centres
  - Affordability
  - Carbon Trading
- ***NMT to support movement to and from Educational Institutions***
- ***NMT to assist in improving Air Quality***
- ***Expansion of the Recreation Cycle Routes through Open Spaces***

(c) Johannesburg Development Agency (JDA)

In 2007/2008, the JDA embarked on an R 171 million upgrade of Hillbrow and Berea. The intervention (which includes new paving, lighting, special parking bays, benches, bins, bollards and new bus shelters) upgraded 220 city blocks, targeting Pretoria, Claim, Twist, Bruce, Quartz (including the linear market) and Kotze Streets. Five parks were also upgraded with sports and play facilities and the installation of public art, sanitary lanes cleaned, Governor's House restored, the Hillbrow Recreation Centre renovated and two new public toilets built.

13.3.4 West Rand District Municipality

(a) West Rand District Municipality Public Transport Plan – Consolidation of Corridors, 2008

The objectives of the study are the following:

- Identify corridors for possible subsidised bus services;
- Determine the appropriate mode for each corridor;
- Identify current minibus-taxi routes that can remain as direct routes; and
- Identify current minibus-taxi routes that can be changed into feeder services.

Some NMT criteria regarding public transport covered in report are:

- Network coverage – a comprehensive network where walking distances and number of transfers are met;
- Stops should not exceed a distance of 500m in urban areas and 1km in peri-urban areas;
- Operators will be required to pick-up and drop-off passengers only at authorized stops; and
- Accessibility - provision of pedestrian walkways and safe parking for bicycles at main public transport stops.

13.4 Assessment of NMT

Non-Motorised Transport (NMT) addresses the transportation needs for pedestrians, bicycles, people with disabilities, prams, trolleys, etc.

Non-motorised transport planning in the past has received relatively little attention by the three spheres of government and was limited largely to the planning and provision of pedestrian facilities along the road network. However, society and the public sector is slowly awakening to the importance of this component of the transport system, which enhances local access, safety, as well as contributing to the development of a more sustainable urban environment.

The Department of Transport prepared the guidelines for Pedestrians and Bicycle Facilities in 2003. The DOT has for many years managed the Shova Kalula bicycle program with the respective Provinces and Municipalities, but the main focus of this program is rural areas. The DOT also prepared a Draft NMT Policy in 2008. Similarly, the Gauteng Department of Roads and Transport also prepared a NMT policy, and the City of Johannesburg, Ekurhuleni Metropolitan Municipality, and the City of Tshwane prepared their respective NMT Frameworks. The City of Tshwane as part of its BRT program developed a guideline for accessibility which addresses pedestrian, bicycle, and people with disabilities access management and infrastructure. The DOT together with PRASA also prepared an accessibility guideline for passenger rail. The DOT also carried out a feasibility study for the establishment of a bicycle manufacturing plant in South Africa, in order to optimise the Shova Kalula program.

The City of Joburg has taken the lead with its City Greening Initiative, with its *Complete Streets* and *Streets Alive* programmes, as well as the development of a cycling framework. The Gauteng Department of Transport is currently implementing sidewalk infrastructure in various areas around Gauteng. The City of Tshwane developed Pedestrians Safety Plans

and NMT Master Plans for each of its planning regions, which also incorporated the Shova Kalula bicycle program of the DOT.
An assessment of the state of non-motorised transport revealed;

- More than 23 per cent of the work force and 90 per cent of scholars (in some parts of the Province) walk to their final destinations. Many others are walking to public transport facilities (rail, bus, taxi) as part of their commuting trip according to the National Household Travel Survey, 2003;
- NMT road users comprise about 40 per cent of all road fatalities in South Africa, and large numbers of pedestrians are maimed for life, with Gauteng, KwaZulu-Natal and Western Cape provinces being the major problem areas, and;
- NMT casualties place a huge burden on the national and provincial fiscus, national health system, police and traffic administration, third party claims, etc.

A very significant portion of daily commuters walk to work and an even larger proportion of commuters walk to access public transport. This is often done under very unsafe, insecure and inconvenient conditions caused by the lack of good non-motorised transport (NMT) facilities and amenities. This explains the fact that 40% of road fatalities are of pedestrians. Although not such a significant mode of transport in Gauteng currently, the same goes for cyclists.

A number of non-motorised initiatives are being implemented in Gauteng, namely, City of Johannesburg's "Streets Alive Programme" and cycling framework; the City of Tshwane's NMT Master Plan, 2010; Gauteng NMT Policy Guidelines, 2005; and distributing bicycles such as Qhubeka and Shova Kalula. The "Streets Alive Programme" seeks to establish high quality pedestrian and cycling routes across Johannesburg to establish NMT as preferred mode for short distance trips; to increase the NMT modal split; to facilitate access to the City for marginalised and low income families; and to integrate NMT with other strategic public transportation initiatives such as Gautrain, Metrorail and BRT. The City of Tshwane's Non-Motorised Master Plan identified various implementation projects for the provision of bicycle routes in terms of the Shova Kalula Bicycle Project. Many of these projects are located within marginalised areas. The Gauteng NMT Policy Guidelines pertain to the type of pedestrian and bicycle facilities to be provided along the various classes of urban and rural roads and streets in the province.

Qhubeka, which means 'to move forward', is a Corporate Social Investment Project backed by MTN that aims to help rural communities advance their lives by providing bicycles to children in return for work done to improve their environment and communities. It is funded

through bike sales, Corporate Social Development funds, corporate sponsors and donors, consulting, events, fund raisers, individual donors, and merchandise sales and sports team endorsement. The *Shova Kalula (Ride Easy)* programme was initiated by the Department of Transport. The primary focus is on providing scholars with bicycles.

However, the challenge remains to establish a coordinated approach toward NMT across the Gauteng City Region and integrating the above-mentioned NMT initiatives. Furthermore, the provision of NMT facilities and amenities are relatively inexpensive and can make a huge difference to the quality of life of most inhabitants of Gauteng, especially those living in previously disadvantaged communities.

This illustrates that NMT needs far more attention and prevalence in order to promote:

- Liveable urban areas,
- Convenient local access,
- Safe neighbourhoods, and
- Sustainable development.

The current challenge among planning authorities is although plans, policies, and guidelines are in place, there is need for prioritisation of NMT, provision of budget, communication, and resources to manage the implementation. There is need for a concerted effort by the Province and the Municipalities to prioritise NMT. This will be achieved through a Provincial and Municipal NMT Master Plan with committed budget.

The GDRT developed an NMT implementation plan for the current MTEF period comprising the following construction projects:

- Construction of 5km walk ways and bicycle lanes in Ekurhuleni Metropolitan Municipality
- Construction of 8km of walk ways and bicycle lanes along Wessil Mota Street in Sedibeng District Municipality
- Construction of 7km of walk ways and bicycle lanes along Phatudi and Hinterland streets in City of Tshwane
- Construction of 6.6km walk ways and bicycle lanes in Kaalfontein
- Construction of 4km ofwalk ways and bicycle lanes in Bophelong on Lillian Ngoyi
- Construction of 9.4km walk ways and bicycle lanes in Winterveldt
- Construction of walk ways and bicycle lanes in Westonaria and Carltonville
- Construction of walk ways and bicycle lanes in EMM

- Construction of walk ways and bicycle lanes in Gauteng
- Shovakalula Programme in Sedibeng, Ekurhuleni and Metsweding
- Shovakalula Programme in all municipalities in receipt of bicycles

14 AIRPORTS PLANNING

14.1 State of Planning

Table 14.1 is a list of reports addressing Airport Planning in the Province:

Table 14.1 – List of Airport Planning Reports

	Plan Title	Completion Date	Approval Status
1	Department of Transport: Natmap	2010	Approved
2	National Airports development plan		Draft / Confidential
3	National Airspace Master Plan 2000-2010	2000	Approved
4	ACSA 2011 Integrated Annual Report	2012	Annual Report
5	ACSA Aviation traffic Forecasts 2011 to 2035	Jan 2012	Confidential
6	JIA Master plan Update 2005 2006	2006	Final report
7	ORT Integration report	2006	Third Draft
8	ACSA Cargo Strategy for JHb International Airport	2006	Final report
9	Evaluation of Cargo Business Models for ORTIA Phase 1	May 2011	Final Report
10	OR Tambo International Airport: Mid Field terminal		No published information
11	Lanseria International Airport: Detail design and tender documentation for new runway	2011	Issued to call for tenders
12	Lanseria Business Plan		Strictly Confidential
13	Wonderboom Airport: EIA Development of an residential Airpark	2007	Approved
14	Wonderboom Airport: EIA to lengthen the main runway construct a new control tower and develop	2007	Approved
15	Wonderboom Airport: Development plan		Approved

14.2 Current Transport Realities, Problems and Issues

Aviation in South Africa is regulated by the South African Civil Aviation Authority (SACAA) a fully owned state enterprise. The three larger international airports in South Africa, OR Tambo (Gauteng), Cape Town and the King Shaka International Airport (Durban) as well as a few regional airports (Port Elizabeth, East London, Braam Fischer (Bloemfontein), George, Upington and Kimberly) is owned and controlled by the Airports Company of South Africa (ACSA). ACSA is a semi state owned company and the major shareholder is the Department of Transport. ACSA has been founded and is managed in terms of the Airports Company Act (Act no 44 of 1993).

14.2.1 O R Tambo International Airport

OR Tambo International Airport is the largest airport in Africa and connects Southern Africa with the World. The airport is of utmost importance for Southern Africa, South Africa and Gauteng. The airport has recently been upgraded and has a capacity of between 25 and 28 million passengers per annum (mppa). Current usage is in the order of 20 mppa and the split between domestic and international passengers' movements is almost 50:50. In 2011, OR Tambo International Airport was rated 31st in the world in terms of quality of service and passenger experience. Depending on the growth in the South African economy the airport has adequate facilities to accommodate the predicted demand for the next 5 to 10 years. Current projects at the airport involve refurbishment of existing facilities and routine maintenance. ACSA envisage revitalizing the planning of the midfield terminal by mid-2012. Approval for the development as well as the Environmental Impact Assessment should be completed by the end of 2014, the detail design by mid-2017 and the complex will be opened by the end of the decade. At that stage OR Tambo International Airport will consist of two fully fledged terminal complexes sharing the same runway system. The development of the midfield terminal will have an impact on the provision of road rail and public transport and should be integrated with the Gauteng integrated transport master plan. The Ekurhuleni Aerotropolis to be developed with its core the airport has been outlined by the State President his honorable Min. Jacob Zuma as one of the 17 Strategic Investment Projects in South Africa to stimulate future economic growth and employment creation. This has also been supported by the Premier of Gauteng Honourable Nomvula Mokonyane in her budget speech as well as the Executive Mayor of Ekurhuleni Clr. Mondli Gungubele.

14.2.2 Lanseria International Airport

Lanseria International Airport is the second busiest airport in Gauteng and the fourth busiest airport in South Africa. Scheduled flights from Lanseria are available to Cape Town and King Shaka (Durban). Lanseria also has mammoth facilities for Corporate and General Aviation. Lanseria is privately owned and processes approximately 2 million passengers per annum, of which 20% use the airport for cross border flights to neighboring countries. The development plan makes provision to develop a new 3 200 m long runway and extend the apron, terminal building and motor car parking. Provision is made in the airports master plan to upgrade the airport to accommodate up to five million passengers per annum. There is also a plan to develop a second Aerotropolis in association with the City of Joburg Metropolitan Municipality. The R512 (Malibongwe Drive) which provides access to the airport from the N14 has recently been upgraded. However, a more direct connection between the Airport and the Sandton/Fourways areas might be a large advantage to

stimulate the usage of the airport. Both the project planning department at OR Tambo as well as airport management at Lanseria expressed their concern that the public transport between the two airports should be upgraded and mentioned their desire that the Gautrain bus network should be expanded to include Lanseria.

14.2.3 Wonderboom Airport

Wonderboom Airport is owned and managed by the City of Tshwane. The future planning for the airport is to enter into a private sector agreement to manage and develop the airport to the benefit of the residents in the City. Scheduled flights were introduced from the airport to Cape Town and Durban but the operator was liquidated. Based on discussions with Airport Management there is a need for these flights and they are busy with negotiations with other service providers to reinstate the service. The development plan for the airport is approximately 10 years old and has never been updated. They have also received a conditional environmental approval to lengthen their main runway to 2 700 m in 2007, but could not acquire the necessary funding to further investigate the issues raised by the environmental authorities. The City has also lodged a number of requests to reinstate the international designation of the airport after it has been withdrawn in 2000. The airport is experiencing a positive growth in aircraft movements and a number of new hangars have recently been developed at the airport. Accessibility to the airport is a major concern as the majority of airport users travel through a residential area to the airport. The City is currently upgrading Linveld Road and the connection of the airport with the N4 freeway is for the City and Province a priority but it is not included in the budget of any one of these authorities. Airport Management indicated that the main problem at Wonderboom Airport is that it is extremely difficult to manage the airport within the constraints of a local government dispensation.

14.2.4 Other Airports

The other two main civilian airports in Gauteng is Rand Airport in Germiston and Grand Central in Midrand. Both airports have terrain restrictions to be expanded to accommodate any larger aircraft.

A further issue to be investigated in the ITMP is the influence of an improvement in land based transport to aviation. Should a high speed rail link be constructed between Gauteng and Durban it will have a major impact on the passenger and freight movements at the OR Tambo International Airport.

15 INTELLIGENT TRANSPORT SYSTEM (ITS)

15.1 Introduction

Internationally, ITS has evolved through a process that began in the 1960s, with the advent of integrated circuits and microprocessors, until the early 1990s when this technology was incorporated into land transportation. The term Intelligent Vehicle Highway Systems (IVHS) was coined at that time and this term was later changed to Intelligent Transportation Systems (ITS). In 1991 the USA Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA) and provided a sizeable commitment of funds for ITS planning, design and deployment which accelerated the ITS initiative within the USA. In 1996, the AZTech project was awarded a $7.5 million grant from the U.S. Department of Transport, as part of its $35.5 million ITS Model Deployment Initiative program, and this essentially became the first full scale ITS deployment initiative.

From a South African perspective, most of the ITS projects before 2001 were being undertaken by the Durban, Cape Town and Johannesburg Municipalities, in the form of Urban Traffic Control, managing a system of signalised intersections from a Traffic Management Centre (TMC).

On 11 Feb 2000 a South African ITS Committee was formed, comprising government representatives at local, metropolitan, provincial and national levels. This body was run under the COLTO structure, reporting to LTCC on recommendations regarding national ITS standards and protocols which were ultimately submitted to MINCOM for review and approval. LTCC was soon disbanded which saw the South African National Roads Agency (SANRAL), GDRT, Durban (eThekweni) & Cape Town Municipalities and leading Consultants establishing a national ITS forum, The South African Society for Intelligent Transport Systems (SASITS), in March 2001. This forum was subsequently renamed Intelligent Transport Society of SA (ITS SA) and took responsibility for managing the fledgling ITS industry.

This effectively signalled the launch of ITS in South Africa, however it was the 2010 Soccer World Cup that created the catalyst for ITS, with an injection of funding on an unprecedented scale that could actually sustain a local ITS industry.

A Request for Proposal was subsequently advertised by ITS SA, to undertake a Market Study of the ITS Industry in July 2010 but was aborted through lack of funding. The aim of this exercise was to provide strategic insight into the size, scope and direction of the local

ITS market but to date, no such study has been conducted on the status quo of ITS in South Africa.

15.2 State of ITS Planning in Gauteng

While there have been a number of draft ITS Strategy documents prepared only two have actually been implemented, Johannesburg Roads Agency (ITS Roadmap) and SANRAL National ITS Strategy. **Table 15.1** lists these ITS Strategy documents.

Table 15.1 – ITS Planning in Gauteng

No.	ITS STRATEGIC PLAN	DATE
1.	Johannesburg Roads Agency (ITS Roadmap)	October 2006
2.	SANRAL National ITS Strategy	January 2010
3.	Gauteng ITS Strategic Plan	June 2010

15.3 Current Gauteng ITS Deployment

Table 15.2 indicates the implementation of ITS related projects by the various planning authorities in the Gauteng Province.

Table 15.2 – ITS Implementation in Gauteng

	SANRAL	Jo'burg	Tshwane	Gautrain
Variable Message Signs (VMS)	☺	☺		
Urban Traffic Control (UTC)	☺	☺		
Traffic Management Centre (TMC)	☺	☺		
Closed Circuit TV (CCTV)	☺	☺		☺
Freeway Management System (FMS)	☺	☺		
Ramp metering	☺			
Automated traffic counting	☺			
Bus priority		☺		
Public transport trip information		☺		☺
Electronic Fare Collection (EFC)				☺
Advanced Public Transport Management Systems (APTMS)		☺		

	SANRAL	Jo'burg	Tshwane	Gautrain
Electronic enforcement		☺	☺	
Data management	☺			
Licence plate recognition (ANPR)	☺	☺		
Open Road Tolling (ORT)	☺			

15.4 Recent Flagship Gauteng ITS Projects

15.4.1 SANRAL Freeway Management System

This SANRAL initiative saw the first large scale deployment of ITS in Gauteng, with a central TMC located at Midrand. The project covered 200km of Gauteng freeways and deployed CCTV cameras, radar vehicle detection and variable message signs (VMS) to support incident management and provide en-route traveller information. In addition to these primary services, pilot deployments of ramp metering, innovative vehicle detection, and shoulder lane control were installed on the N1 highway.

15.4.2 Johannesburg BRT (Rea Vaya)

BRT is simply an idea of creating a rail-like performance using affordable road-based technologies, including median dedicated bus lanes, closed median stations with pre-board fare collection and fare verification and larger vehicles to better match supply to demand. When completed the BRT system will comprise a route covering 122kms from Lenasia in the South to Rivonia in the North) and 150 stations and use 1,200 busses.

The BRT uses cutting edge electronic payment technology and a bus scheduling system incorporating satellite tracking to improve the overall effectiveness of the system and provide a safe and reliable public transport service.

15.4.3 SANRAL ITS Design, Build, Operate & Maintain (DBOM)

A DBOM contract has been awarded to manage traffic by means of the use of ITS technologies in order to optimise the use of road infrastructure, including reducing delays and improving the safety of persons travelling on the freeways. This project covers Gauteng, KwaZulu-Natal and the Western Cape (as well as some of the functions currently

centralised as the National ITS at the Gauteng TMC) and involves the deployment of all currently available ITS technologies and associated knowledge transfer from the internationally recognised experts involved.

15.4.4 Gauteng Integrated Fare Management (IFM) Framework

In April 2011, Gauteng Provincial Department of Roads & Transport undertook the "Completion of Public Transport Systems Planning and Development of an Integrated & Interoperable Fare Management (IFM) Framework", which was the successor to a previous desktop study on IFM. This document is currently in draft form and will be finalised by July 2012.

This IFM Framework focussed on the integration of all aspects of electronic fare payment systems in Public Transport, particularly the requirement that these systems must comply with the recently gazetted DoT Regulations on Electronic Fare Collection.

Development of this framework required consultation and cooperation with key stakeholders, in order to understand their existing services and what measures would be required for them to be compliant with the DoT EFC Regulations and to ensure interoperability with other IFM related technologies that are currently being installed. These consultations facilitated the undertaking of Institutional Agreements with stakeholders and preparation of User Requirements.

16 SUSTAINABLE TRANSPORT

16.1 Status Quo Assessment

16.1.1 City of Tshwane BRT

Phase 1 of the Tshwane BRT is to be located between Akasia and Menlyn and from the CBD to Hatfield in January 2014 with future extensions including routes from Akasia to Kopanong and Menlyn to Mamelodi. Future Extensions (Phase 2-4) include services to Centurion, Atteridgeville, Mamelodi via Zambezi and Solomon Mahlangu Drive (Previously Hans Strijdom Drive).

(a) Findings

- Integrating road transport with rail has a primary objective of moving large volumes of passengers from all walks of life – including learners, workers or business executives – in a safe, reliable and clean service.
- The Tshwane BRT aim to replace existing buses and taxis where services have traditionally been provided. This could entail buying out taxis operating licenses, these operators will be absorbed into the new BRT system.
- The current proposed target for “Transport Energy Efficiency” is a reduction of 15% by 2025, or more simplistically, a 15% reduction in fuel consumption in the Province.
- 15% reduction in fuel consumption can be calculated as follows;
    - 15% fuel saving = 0.98 million litres per day
    - 1.1 million people required to switch from private car to BRT
    - 2400 BRT busses required
    - 7200 job creation potential
- In order to re-orientate transportation in a “green” economy, transportation should be affordable, safe, and job-creating, promote short distance trips and be low in carbon emissions.
- Fuel consumption by bus is higher than by minibus taxi. The Bus Rapid Transport (BRT) system is likely to improve this significantly.
- The system will lead to a reduction of vehicles on the road thus contributing to the reduction in greenhouse gas emissions as well as fuel consumption.
- The use of the following Intelligent Transport Systems (ITS) will reduce travelling time and thus reduce emissions and fuel consumption:

- The BRT system will use modernised bus technologies, Wi-Fi, CCTV as well as real-time commuter information boards.
- The system will use an integrated electronic fare collection system based on smart cards.
- Busses will be tracked via CCTV and GPS monitoring, this will allow the operator to monitor bus schedules

(b) Recommendations

- No applications / authorisations required in terms of NEMA or NWA seeing that the route will occur within the existing road network.
- Portions of the development are located in a historically built landscape which includes the Church Square Heritage Area and some other structures like the Heys Memorial Hall building, and the Aspasia Building/Zoo Café that are older than 60 years. Some of these buildings are of national, provincial or local heritage significance and an application for heritage authorisation will therefore be submitted to the Gauteng Heritage Authority (GHA) (the competent authority).
- Specialist studies conducted for the proposed CTMM BRT concluded that the proposed route will have an insignificant impact on the environment (fauna, flora and wetlands). A sensitivity map produced for the study area (indicating areas of higher ecological importance within and adjacent to the proposed development area) must be strictly adhered to and taken into considerations during the planning/pre-construction and construction phases.
- Local transport cannot work if it does not incorporate a good bus service that is accessible, affordable and attractive to a broad range of people across society.
- To shift transportation towards a low-carbon environment, the following strategic changes should be addressed:
- Promote a major shift from private to public transport
- Increase in quality, affordability and availability of public transport
- From an environmental point of view, one of the most important operational considerations is the impact of the vehicles chosen. At least the following factors should be considered:
    - Emission standards – range from Euro I to Euro VI and are dependent on fuel quality, engine technologies, emission-control technologies, inspection and maintenance programmes and driver training;
    - Fuel type – these can include standard diesel, clean diesel, compressed natural gas (CNG), liquid petroleum gas (LPG), bio-diesel and ethanol; and

- Noise levels – determined by fuel and propulsion systems, size of vehicle relative to engine size, dampening technologies and exhaust system, quality of road surface and maintenance practices.

(c) Critical Gaps

- Although reduced, the system will still use fuel produced from coal and contribute to greenhouse gas emissions.
- Benefits to the environment are reduced if the system does not operate at full capacity.

16.1.2 City of Johannesburg BRT

Phase 1A of the approved BRT system has been completed and links Soweto (including Nasrec and Orlando stadium) to the inner city and Ellis Park. Phase 1A consist of 25.5 km of trunk infrastructure and approximately 27 stations and is anticipated to attract a patronage of approximately 69 300 daily commuters. Whilst the BRT stations and the public realm within the immediate vicinity of the BRT terminals and stations have been upgraded, the wider public realm will remain as is.

(a) Findings

- Integrating road transport with rail, its primary objective is to move large volumes passengers from all walks of life – including learners, workers or business executives – in a safe, reliable and clean service.
- The Johannesburg BRT aim to replace existing buses and taxis where services have traditionally been provided.
- In order to re-orientate transportation in a “green” economy, transportation should be affordable, safe, and job-creating, promote short distance trips and be low in carbon emissions.
- Fuel consumption by bus is higher than by minibus taxi. The Bus Rapid Transport (BRT) system is likely to improve this significantly.
- The system will lead to a reduction of vehicles on the road thus contributing to the reduction in greenhouse gas emissions as well as fuel consumption.
- It will increase mobility and reduce congestion.
- It will reduce the cost of transport to business and workers thus making it more preferable to use than other modes of transport.
- It will enable transit-orientated development along key transport corridors.

- The BRT system uses modernised bus technologies, including intelligent transport systems, Wi-Fi, CCTV as well as real-time commuter information boards.
- It is estimated that this system would reduce CO_2 emissions by 382 940 tons by 2013 and 1, 6 million tons by 2030.

(b) Recommendations

- From an environmental point of view, one of the most important operational considerations is the impact of the vehicles chosen. At least the following factors should be considered:
    - Emission standards – range from Euro I to Euro VI and are dependent on fuel quality, engine technologies, emission-control technologies, inspection and maintenance programmes and driver training;
    - Fuel type – these can include standard diesel, clean diesel, compressed natural gas (CNG), liquid petroleum gas (LPG), bio-diesel and ethanol;
    - Noise levels – determined by fuel and propulsion systems, size of vehicle relative to engine size, dampening technologies and exhaust system, quality of road surface and maintenance practices; and

(c) Critical Gaps

- Although reduced, the system will still use fuel produced from coal and contribute to greenhouse gas emissions.
- Benefits to the environment are reduced if the system does not operate at full capacity.

16.2 Non-Motorised Transport

16.2.1 Tshwane Precinct Master Planning – Beautification Project

The beautification project that forms part of the Tshwane Precinct Master Planning Project includes a concept design for the section of Paul Kruger Street between Scheiding Street and Church Square and could possibly be extended to include the corridor between Church Square and the Pretoria Zoo in Boom Street.

Current infrastructure is impeding pedestrian traffic flow such as road signage obstructing pedestrian movement. The existing four vehicle lanes will be reduced to two with the present alignment of the BRT system in the Inner City to use the Paul Kruger Street corridor.

(a) Findings

- This project has the potential to improve the community by allowing them to prosper in a safe and healthy environment.
- Complete transformation and regeneration of the inner city into a sustainable arena.
- Sustainable infrastructure design is not just about new infrastructure. It is about rehabilitation, reuse or optimisation of existing infrastructure, which is consistent with the principles of urban sustainability and global sustainable development.

(b) Recommendations

- To shift transportation towards a low-carbon environment, the following strategic changes should be addressed:
    - City planning should shift from road-driven infrastructure development to rail, bicycle and pedestrian driven infrastructure development
    - Facilities such as work, home and schools must be brought closer to residential areas

(c) Critical Gaps

- The socio-economic impacts of this proposed project is uncertain and specialist studies are required to determine impacts on local businesses and current road users.
- The contribution to the reduction in greenhouse gas emissions and fuel consumption will be minimal.

16.2.2 Gauteng Walking and Cycling on Roads and Streets

Focus is placed on pedestrian facilities along Class 2 roads to give access to public transport rather than to walk parallel to the road. Currently there are no to limited provision made for cyclists and pedestrians in the road cross section. Proposed walkways and cycle roads will create short distance strategic links within urban areas with cycle and pedestrian movement being separated, particularly along mobility routes. Cycle routes will make provision for commuter and sports cycling in road reserves of Class II roads. Class II and III roads will not be used by learners and where the speed limit is 80km/h or higher, Class I, II, or III cycle roads will be implemented. Ten areas within the City of Johannesburg have been identified for the implementation of the project. These include; Soweto network (Area 1), Inner City network (Area 2), Alexandra/Wynberg and Sandton/Linbro Park (Area 3),

Rosebank precinct (Area 4), University of JHB route (Area 5), Zandspruit/Cosmo priority route (Area 6), Diepsloot priority route (Area 7), Ivory Park route (Area 8), Orange farm (Area 9) and Braamfontein Spruit route (Area 10).

(a) Findings

- Non-motorised transport infrastructure could alleviate congestion on Gauteng roads. The reduction in motorised vehicle use will noticeably reduce greenhouse gas emissions, fuel consumption and environmental degradation.
- As a result of the large speed differential between pedestrians/bicycles and motorised transport along the provincial road network, only pedestrian and bicycle paths, which separate pedestrian and bicycle traffic from the roadway, will have to be implemented along provincial routes.
- Road users require good facilities to encourage them to use other means than a car trip. However, good facilities are not enough; people have other reasons for taking a car instead of walking and cycling such as workplaces being located far from residential areas.

(b) Recommendations

- Due to the distances travelled by vehicle road users, it is unlikely that road users will trade in their vehicles or public transport for bicycles.
- Although non-motorised road use will contribute to the alleviation of congestion on roads, the amount of users needed to reduce emissions and fuel consumption is unrealistically high and not sustainable.
- The development of an intensive marketing strategy on promoting walking and cycling would be needed to replace short vehicle trips.

(c) Critical Gaps

- Pedestrian and bicycle safety is currently a serious problem in South Africa seeing that they are the most vulnerable road users and contribute significantly to road fatalities in the country.
- Non-motorised road use planning would have to take into consideration the varying categories of road users namely cyclists (ranging from children, inexperienced to the experienced) and pedestrians (including children, the elderly and the disabled).
- A cross section of the road would have to incorporate the following: pedestrian sidewalks and walkways; bicycle lanes and ways; shared pedestrian and bicycle roads;

pedestrian crossing facilities as well as supplementary measures such as road signs, lighting etc. This could pose a serious problem within the urban setting due to the limited space currently available.

16.2.3 Tshwane Non-Motorised Transport Master Plan – Shova Kalula Bicycle Project

The objectives of this project are to promote cycling as a low cost mobility solution to enhance rural accessibility and urban mobility. It will facilitate an enabling environment that will mainstream cycling and intermediate transport operations into the public transport system.

(a) Findings

- The vision of the Department is to maximize the use of non-motorized transport to enable communities to access social and economic opportunities at a cheaper cost.
- It could improve levels of mobility and accessibility by integrating rural, peri-urban and urban people into an effective transport system.
- It could facilitate an enabling environment that will mainstream bicycle transport into public transport system through the provision of an appropriate institutional support mechanism.

(b) Recommendations

- Due to the distances travelled by vehicle road users, it is unlikely that road users will trade in their vehicles or public transport for bicycles.
- Although non-motorised road use will contribute to the alleviation of congestion on roads, the amount of users needed to reduce emissions and fuel consumption is unrealistically high and not sustainable.
- The development of an intensive marketing strategy on promoting walking and cycling would be needed to replace short vehicle trips.

(c) Critical Gaps

- It is estimated that bicycle volumes must be increased to between 500 and 1000 per community to make the necessary impact, and to make bicycle shops sustainable.
- Although there is a reduction in motorised transport, it will play an insignificant role in the reduction of greenhouse gas emissions and fuel consumption.

16.2.4 Intelligent Transport System Strategy

Intelligent Transport Systems (ITS) aim at reducing traffic congestion thus increases the efficiency of transportation infrastructure and decreasing travel time which will lead to a reduction in air pollution and fuel consumption. This includes technology used for electronic payment used in public transport (fares) as well as open road tolling (fees). It also plays a significant role in traffic management or control, freeway and arterial management, freight and overload control as well as parking management. The benefits of ITS for transport includes the reduction in traveller delay, travel time reliability, safety and security benefits, environmental benefits (reduction in emissions and fuel consumption) and community satisfaction. The Gauteng ITS Strategy will involve the planning, funding and deployment of ITS technology in order to ensure the optimal utilisation of the existing transportation network in the Province.

(a) Findings

- Intelligent transport could contribute to the alleviation of traffic congestion thus reducing travelling times which decreases gas emissions and fuel consumption.
- ITS will contribute significantly in time and accident cost saving.
- Limited ITS implementation will have an insignificant contribution to emission/fuel saving as well as operating cost saving.
- Only implementation on a large scale would contribute to emission and fuel consumption reduction.

(b) Recommendations

- If Intelligent Transport Systems are applied in an integrated program to the transport industry, it will positively impact on South Africa's economic, environmental and social needs and objectives.

(c) Critical Gaps

- Not enough research has been done to determine the benefits and cost effectiveness of ITS.
- Lack of resources, funding, skills and expertise to implement the strategy.
- Lack of ownership of ITS function.
- Lack of understanding and/or appreciation of relevant technology required.

17 TRANSPORT REGULATION AND ENFORCEMENT

17.1 Background

South Africa, as a developing country, has a very high rate of road traffic accidents with more than 14 000 fatalities and an estimated 150 000 injuries per year. The economic cost of this unsafe transport environment, with an estimated 40 fatalities per day and countless more accidents is estimated to be at least R210bn per year. Law enforcement in both road traffic and road transport, is often also deficient and problematic. This often gives rise to unlawful operations and poor driving habits.

Latest available statistics is 2005 and that indicated that Gauteng has the highest number of fatal crashes (2 621, or 23% of all fatal crashes) and also the highest number of fatalities (2 922 or 21% of all fatalities in the country). The statistics also indicated that 41% of fatalities can be attributed to pedestrians countrywide, and there is no evidence it would be different for Gauteng.

According to the World Health Organisation, road traffic accidents are ranked 9th overall in terms of the leading causes of death worldwide. This ranking rises to 3rd in the 5 – 44 age groups and is ranked first when applied to people aged between 10 and 24 years.

South Africa has pledged its allegiance to the United Nations' "Decade of Action for Road Safety 2011 - 2020", which is aimed at first stabilising and then reducing road deaths by 2020. This program identified five crucial focus points that should guide countries in terms of action plans. The five components of the program can be seen in **Figure** 17.1:

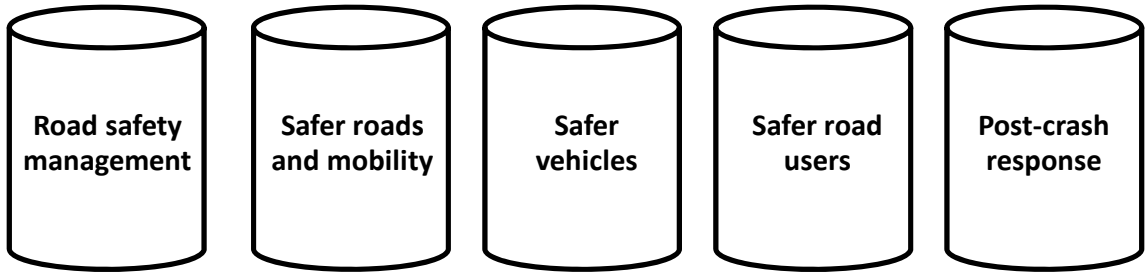


Figure 17.1 - United Nations Decade of Action to Road Safety Components

These components are similar to the South African Road to Safety Strategy 2001 – 2005, with its key focus areas of:

- Law Enforcement and Compliance
- Operator, vehicle and driver fitness
- Infrastructure, management and information systems
- Communication, public education and participation

The Road Traffic Management Corporation (RTMC) has acknowledged both these approaches and the Moscow Declaration of 2009, which can be summarised as "*safe users on safe roads in safe vehicles at safe speed*".

17.1.1 Enforcement on Overload Control

The Gauteng Province is a hub of economic activity in South Africa therefore a large percentage of road freight enters and leaves the province on a seven major corridors.

Because of the nature and high density of the road network in Gauteng, there are a multitude of alternative routes that operators can use to avoid operational weighbridges. Experience has shown that overloading control on a single route is largely ineffective unless alternative routes are monitored as well. Typically when a weighing exercise commences, heavy truck drivers, with the aid of long distance radios and cellular phones, select alternative routes within an hour or less, in order to avoid the operational weighbridge. For this reason, the roving screening teams often have to operate in an area, rather than on a specific escape route.

Although there are overload control stations on the major routes in the Gauteng Province, the Province has direct bearing on cross-border vehicles. Therefore it has to control and eliminate if necessary the cross-border overloaded vehicles before they enter South Africa.

17.1.2 Legislation

To protect the investment in roads as well as for reasons of road safety and traffic management, the permissible dimensions and masses of vehicles operating on public roads are specified in the National Road Traffic Act and Regulations.

Under special circumstances a need may arise for activities that may not be allowed under normal conditions (such as mass sporting events) or it may be necessary to accommodate vehicles or loads that are practically unable to comply with the provisions of the Road

Traffic Act and Regulations. In such cases the Act empowers roads authorities to issue exemption permits under strictly controlled conditions in terms of firm guidelines.

17.1.3 Overload Control

An overload controlled strategy was prepared for the Gauteng Department of Transport and Public Works (GPDTPW) by the CSIR in 2000, and was updated in 2003. A short, medium and long term strategies were prepared with the aim of reducing overloading from an estimated extent of between 15 and 30 per cent of all heavy vehicles to 5 per cent (including vehicles overloaded but within the allowable tolerance limits).

However, the Gauteng Overload Control Strategy needs to be reviewed. During such a review it would be of utmost importance that the proposed overload control on the Gauteng Freeway Improvement Project (GFIP) road network be taken into consideration as this would have a major impact on the number and position of the static weighbridges and the WIM sites that would be required to adequately control overloading in Gauteng. Alternatives to conventional static weighbridges should be investigated as part of the strategy review.

The Road Freight Strategy for South Africa focuses on different road freight issues, including overload control. The aim is to improve **overload control management system,** through a series of coordinated solutions such as the establishment of a national inspectorate, utilization of mobile technologies, administrative enforcement approaches, credible deterrents and data intelligence.

Current weaknesses in overload control span all aspects – infrastructure, planning, operations, ability to enforce and collect the fines and penalties. Habitual overloaders and alleged rogue operators are tarnishing the image of the road freight industry, and there is lack of success to show that such practices have been successfully dealt with. To tackle the issue, a multidisciplinary and concerted effort is proposed, involving strong deterrents against overloading, attractive incentives to comply with the law, and an improved capacity of law enforcement through more funding, use of technology and data intelligence. To ensure that law enforcement works as an integrated system, it is proposed that a single overload control inspectorate is established.

Proven strategies to deal with habitual overloaders have been developed based on international best practice. The Heavy Vehicle Accreditation Scheme (LAP) is an initiative to introduce self-regulation, as opposed to legal enforcement, in the heavy vehicle transport industry, and aims to promote professionalism in heavy vehicle transport. In line with the

Department of Transport's National Overload Control Strategy, its aim is to encourage heavy vehicle operators, consignees and consignors to take more responsibility for ensuring that their loads are transported legally.

(a) Weighbridges

There are currently 19 weighbridges in Gauteng. Two of these are operated in partnership with SANRAL, four are provincial weighbridges, twelve are municipal weighbridges and one is a private weighbridge.

The weighbridge must comply in all regards with SANS 1838-1. Also the weighbridge must be verified for correctness of mass measurement and the levels of the load receptors and approaches in accordance with SANS 10343.

Heavy vehicles are weighed according to the following procedures as described in the relevant regulations:

- Regulation 365: Overloading on individual axles
- Regulation 365A: Overloading in terms of the bridge formula
- Regulation 362D: Overloading in terms of gross combined mass (GCM)

(b) PPP Weighbridges

SANRAL has entered into partnerships with provincial authorities whereby SANRAL provides the physical infrastructure and the provincial authorities the necessary personnel. It is anticipated that this responsibility will eventually be transferred to the Road Traffic Management Company.

Involvement of private sector operators in the overload control, in particular where private sector has the responsibility for weighbridge maintenance and weighbridge operations, as been proven to reduce the occurrence of bribery. In such cases, the traffic officers are only responsible for enforcement activities. Such separation of duties seems to improve transparency. The PPP model in overload control law enforcement implemented in the Gauteng Province as well as across the Western Cape Province should be used as a valuable benchmark.

The two weighbridges operated in partnership with SANRAL are the Heidelberg TCC on the N3 and the Donkerhoek TCC on the N4. Agreements have been entered into for the

establishment of an additional three TCCs on a similar contractual arrangement - one on the N4 (Pretoria to Bronkhorstpruit stretch) and two on the N4 West Platinum Highway (Swartruggens and Zeerust). There is a management contract with Bakwena for the Mantsole TCC.

(c) Provincial Weighbridges

The fourth provincial weighbridges are located at the Boekenhoutkloof Traffic Training College and are mostly used for training purposes.

(d) Municipal Weighbridges

The municipal weighbridges are all located at vehicle testing stations and are mostly used for tare weighing for vehicle registration purposes, although most of them could be used for law enforcement purposes as well. All the municipal weighbridges are operated and managed by municipal traffic officers.

A private weighbridge is located just off the N1 at the Wallmansthal interchange north of Pretoria. This weighbridge is utilised by both provincial and metropolitan (Tshwane) traffic officers for overload law enforcement.

(e) Monitoring

Even though current legislation in South Africa only permits prosecution with fixed scales (weighbridges), portable scales could in the short term be utilized for screening purposes.

Permanent Weigh-in-Motion (WIM) or Comprehensive Traffic Observation (CTO) sites are used for monitoring. They are also used to select overloaded vehicles to be weighed at a static weighbridge (screening). A network of WIM sites is an essential component of the overload control strategy in terms of monitoring the overloading trends and changing patterns of heavy vehicle volumes in the province.

(f) Resources

In most cases it was identified that weighbridges are underutilized due to manpower (and budget) limitations. The efforts of the traffic authorities in trying to control heavy vehicle overloading can largely be nullified without the backup of legislation and a supportive prosecution system. The general perception of traffic officers is that Magistrates and Public Prosecutors are not sufficiently informed with regards the technicalities of vehicle weighing

and, more importantly, the seriousness of the offence in terms of road damage and road safety.

17.1.4 Abnormal Loads

In order to accommodate vehicles or loads that are practically unable to comply with the provisions of the Road Traffic Act and Regulations, the Act empowers roads authorities to issue exemption permits under strictly controlled conditions in terms of firm guidelines and the provisions of Section 139 of the Road Traffic Act (Act 29 of 1989).

A permit for road usage or to convey an abnormal load or the use of an abnormal vehicle is a privilege and not a right and it is not the intention of the policy to circumvent the Act and Regulations.

A document TRH11 developed by the Abnormal Loads Technical Committee, contains the dimensional and mass limitations and other requirements for abnormal vehicles. This document is used as a guideline for granting of exemption permits for the conveyance of abnormal loads and for other events on public roads.

The following rules, which are addressed in the documents, need to be applied for abnormal loads and vehicles:

- If the vehicle including loads has either 26 ton weight, 2.6m width or 4.3 m height, then it is classified as an abnormal load.
- There is detail planning of the route for the transportation of the abnormal load through the national road network. Also depending on the magnitude of the load, traffic officials may be required to escorts the abnormal load. Traffic officials will only escorts the load within their municipal boundaries. Therefore, abnormal loads traversing Provinces require a permit from each Province.
- Applicants (consultants) are required to apply for a permit for each consignment through the provincial department of transport in Pretoria. The permit details the designation, type of load carried and the route to be followed, and the estimated weight. The information must be fairly accurate in order for the traffic officers to approve the abnormal vehicle and load through the various municipal boundaries. The duration of the application of a permit varies from one to three days.
- The abnormal load can only be transported during weekday from 6am to 6pm, excluding peak periods.

17.1.5 Hazardous Materials

Since it presents a number of risks, the transportation of hazardous materials should be regulated in a manner compliant to international standards. From a government point of view it requires effective legislation and monitoring. From an industrial point of view it requires responsibility from all authorities involved in the transportation and cargo that have the potential to threaten human life and the environment.

Plans for freight vehicles and the routing of hazardous materials through urban areas should be part of the Municipalities' Integrated Transport Plans (ITPs). Even though ITPs have such plans, they are only implemented by the Metropolitan Municipalities, but not by the District Municipalities.

Road signs play an essential part in regulating traffic, warning traffic of hazardous situations ahead, and providing guidance and general information. Therefore, the Municipalities must prioritise the deviation of hazardous materials by road, specifically those transporting hazardous materials away from the core urban areas. This is done through road signs and enforcement.

To reduce the risks and to control the transportation of hazardous materials, the Department of Transport implemented legislation and imposed strict regulations. Regulations pertaining to the movement of dangerous goods are stipulated in the **National Road Traffic Act (NRTA)**. The Act deals with the following:

- The Transportation of Hazardous Waste is covered in the National Road Traffic Act No. 93 of 1996, sections 54 and 55 and regulations 273-282. It incorporates also a number of South African Bureau of Standards (SANS) Codes of practice into law, which are relevant to the transportation of Hazardous Waste. SANS Codes are provided in **Table 17.1**.
- The sixth amendment to the NRTA, Government Gazette No. 25484, 25 September 2003 addressed the need for the driver of the vehicle to keep a route plan in the vehicle, even though it is still a requirement to notify the authorities along the route. This appears to have caused some confusion in the industry and will make it impossible for the enforcement officers to check whether or not the driver is adhering to the submitted route plan.

Table 17.1 - SANS Codes for Hazardous Materials

SANS CODE	ACTIVITY
10228	The *identification and classification* of dangerous goods
10229	The *packaging* of dangerous goods for road and rail transportation in SA
10233	Intermediate *bulk containers* for dangerous goods
11518	Transportation of dangerous goods - *Design requirements for tankers*
11398	*Road tank vehicles for petroleum-based flammable liquids* - Design requirements
10230	Transportation of dangerous goods - *Inspection requirements* for road vehicles
10231	*Operational requirements* for road vehicles
10232-1	Transportation of dangerous goods - *Emergency information systems* - Road Transportation.
10232-2	Transportation of dangerous goods - Emergency information systems - *Emergency Response Guides*

- The requirements of the operator in terms of the regulations are to:
  - Adhere to vehicle and equipment requirements;
  - Provide vehicle signage;
  - Ensure documentation is carried on-board by the driver.
- To ensure that dangerous goods are, as far as possible, not transported through residential and sensitive areas.
- To evaluate route plans submitted by conveyors of dangerous goods, to ensure that the routes are acceptable and do not pose unnecessary and avoidable danger.
- To be capable of efficiently handling incidents involving dangerous goods.
- To have the necessary equipment and substances available to counter dangerous goods spillages.
- To enforce the legislation to ensure that dangerous goods vehicles are recognizable and transported according to the legislation.

The Emergency Management Services of the Municipalities dealing with the movement of dangerous goods is in essence the Departments of Fire Safety and Fire Services Operations.

17.2 Implementation Strategy for Overload Control

17.2.1 Management and Control

Overload control is currently carried out by all levels of government and this decentralised approach to overload control law enforcement is not effective. Planning, co-ordination and evaluation of overload control activities in Gauteng is done by the Overload Control Gauteng (OCG) Committee. OCG Committee is a joint provincial and local government governance structure, which is utilized only as a forum.

However planning, resource management, skills and capacity at the majority of the municipalities and provinces are severely lacking and ineffective.

International best practice shows that effective overload control requires dedicated resources and intelligent, observation-based planning.

As per the Road Freight Strategy, 2011, the goal is to ensure an efficient use of resources in law enforcement and introduce more effective overall enforcement from a national perspective. The key proposed solution is to establish a single national overload control inspectorate and to consolidate the municipal operations to a provincial level, which would then report to the inspectorate. Planning of the regular enforcement activities would take place on a provincial level. The overload control inspectorate will also be the custodian of a national overload enforcement database. The overload control inspectorate should be constituted under Road Traffic Management Corporation (RTMC).

17.2.2 Infrastructure and Operations

The effectiveness of law enforcement on road based freight vehicles is significant to success of the freight strategy as well as overload, abnormal loads, hazardous materials control strategies. The main challenges with overload control in Gauteng are:

- Decentralised overload control
- Inadequate and inefficient infrastructure, planning, operations, ability to enforce and collect the fines and penalties for overloading
- Underutilization of existing weighbridges
- Need for review of the Gauteng Overload Control Strategy
- Routing of hazardous vehicles to be supported with adequate signage on the roads

According to the Gauteng Province Freight Transport Implementation Strategy, the following actions are required in order to adequately control heavy vehicle overloading in Gauteng:

- Upgrade existing weighbridges
- Increase overload control operations at existing weighbridges
- Construct 13 new proposed weighbridges (Meredale, Benoni, Kliprivier, Tembisa, Akasia/Rosslyn, Kempton Park, Vanderbijlpark, Westonaria, Bronkhorstspruit, Eikenhof, Randfontein, Carletonville, Devon)
- Improve effectiveness of screening of vehicles on alternative routes using both low-speed and high-speed weigh-in-motion devices
- Use of privately owned scales for overload operations (aimed at Walmanstall on the N1)
- Sustainable funding for overload control
- Training of traffic officers
- Government initiatives for self regulations practices
- Information management
- Inter-provincial co-operation to combat overloading and standardise law enforcement practices between provinces

17.3 Public Transport Regulation and Control

17.3.1 Legislative Framework

According to the National Land Transport Act , 2009 public passenger road transport services refers to scheduled or unscheduled services for the carriage of passengers for a fare or any other reward whether subject to a contract or not. Road based public transport identified includes:

- Minibus taxis services
- Bus (subsidised and non-subsidised) services
- Metered Taxis
- Tourist transport
- Adapted light delivery vehicles
- Charter services etc

The public transport enforcement process is not at this stage sufficient to enforce the existing legislative frameworks in this respect, nor to ensure that the required vehicle

standards are maintained and the driver properly licensed. Currently enforcement on public passenger road transport is to some extent carried out by the South African Police Service, Road Traffic Management Corporation and Road Transport Inspectors by the Cross Border Road Transport Agency.

The regulation and control of public transport in Gauteng is governed by the following legislations:

- National Land Transport Act 5 of 2009
- Gauteng Public Passenger Road Transport Act , 2001
- Gauteng Provincial Transport Framework, 2011

The following sections briefly outline the main policy requirements and provisions in terms of regulation and control of public passenger road transport.

According to the NLTA no person may operate a road-based public transport service, unless he or she is the holder of an operating licence or a permit, subject to sections 47,48 and 49, issued for the vehicle concerned in terms of NLTA.

The NLTA envisages a public transport inspectorate in Section 86 of the Act. It is stated that the public transport inspectors should be employees of:

- a provincial department, as appointed by the MEC; or
- a municipality to which the operating license function has been assigned

The functions of inspectors appointed are to monitor compliance with this Act in the province, transport area or area of the municipality concerned and to assist with the investigation and prevention of offences contemplated in section 99 which have been committed in that province or area, subject to provincial laws, if any, and the directions of the appointing authority. In performing those functions, an inspector will have all the powers conferred on an authorised officer in terms of this Act.

Offences in terms of the NLTA which authorised officers must investigate and prevent include:

- Operating road-based public transport service without holding the necessary permit or operating license
- Operating public transport service contrary to the terms and conditions of an operating licence
- Contravening any provision of the Act
- Using an operating licence on a wrong vehicle
- Applying for an additional operating licence for a vehicle that is already licensed
- Modifying some aspects of the operating license
- Using a fake document as an operating license
- Providing false information with respect to an application, etc
- Impersonating an authorised officer
- Wilfully obstructing an authorised officer from discharging his/her duties
- Refusing to comply with any lawful order made by an authorised officer
- Refusing to return documents to the Registrar if requested to do so
- Failure to appear before a Board or Registrar etc
- Failure to pay fare, smoke drink liquor, inconvenience fellow passengers, disobey instructions from the driver, endanger fellow passengers' lives
- Failure to comply with any duty imposed by the Act
- Setting down passengers, with the intention of crossing the border, near an international border
- Using an inappropriate vehicle for public transport

The purpose of the Gauteng Public Passenger Road Transport Act is to promote an effective public passenger road transport system in Gauteng and to govern the regulation of public passenger transport and the issuing of operating licenses. In terms of control and regulation of public transport the act envisaged that this would be done through:

- issuing of operating licenses to operators of those services
- Permit motor vehicles to be used for public passenger road transport services only in relation to the types of services offered.
- Provide for the registration of operators providing certain types of public passenger road transport services and associations of those operators.

Section 96 of the Act allows for the Head of Department of Transport to designate an employee of the Department as a transport inspector. According to the Act the officers are empowered to:

- Impound vehicles not in a possession of an operating license
- Seize expired, withdrawn or cancelled operating licences
- Stop vehicles used for the purpose of public passenger road transport and examine documentation authorizing the transport

The Gauteng Public Passenger Road Transport Act is unfortunately based on the repealed NLTTA, and must be reviewed and aligned with the NLTA, 2009.

The Gauteng Provincial Land Transport Framework outlines a comprehensive programme of transport improvements to meet the challenges facing Gauteng Province and achieve the objectives of sustainable transport, determined by Gauteng Department of Roads and Transport (GDRT). The GPLTF articulates clearly the strategies and actions applicable to public transport within the context of the National Strategic Vision that seeks to transform public transport service delivery. With regards to enforcement of the regulations of the NLTA the GPLTF proposes the establishment of a **Public Transport Inspectorate** in conjunction with the Provincial Department of Community Safety as one of its key strategies.

17.3.2 Road Traffic Management Cooperation Law Enforcement Strategy

Traffic officers are mainly responsible for offences against the Road Traffic Act. However, it is also the competency of the Road Traffic Management Corporation through its national training and skills development program to ensure that traffic officers are fully informed and knowledgeable to apply public transport law enforcement according to the Provincial Public Passenger Road Transport Regulations and NLTA.

The Road Traffic Management Corporation has currently developed a Law Enforcement Strategy in terms of which traffic officers will be trained in matters of public transport legislation. The Transport Law Enforcement and Related Matters Amendment Bill 2009 also provide traffic officers with the legislative powers to enforce transport legislation. The traffic officer may therefore provide a valuable resource in terms of enforcement of regulatory controls on road based public transport.

The importance of enforcement in reaching these goals cannot be overstated. The successful implementation of regulatory measures has a critical role to play in road safety. Road traffic injuries and deaths are in many cases a direct consequence of failure to properly enact and enforce rules. Numerous accidents are caused by speeding, drunk-driving, unroadworthy or overloaded public transport and freight vehicles. While effective regulation is not cost free, its costs are dwarfed when compared to the impact of road accidents to the economy. There is no shortage of evidence proving that effective regulation, enforcement and information can deliver improved results. South Africa, and Gauteng, has laws and regulations governing traffic and transport law, but without adequate law enforcement these cannot be effective, as proven by the Province' struggle in regulating Operating Licenses and Permits. Though the mandate and powers of Provincial

authorities are specified in the National Road Traffic Act 93 of 1996, Gauteng is in many ways unique due to the different Metropolitan and Local Municipalities in close proximity to each other. Traffic law enforcement is also in essence more complex than other aspects of law enforcement, due to the constant movement of vehicles and passengers across areas of jurisdiction.

The National Land Transport Strategic Framework stresses the importance of coordinating all law and traffic safety enforcement efforts to prevent duplication and to enhance effectiveness. It further tasks both the Rail Safety Regulator and the Road Traffic Management Corporation to enforce and improve safety levels in rail and road-based transport. This has to be achieved through increased cooperation between the national, provincial and local spheres of government in the management of road traffic, which is one of the main reasons the RTMC was originally created.

In an attempt to improve road safety in general on the roads, the Administrative Adjudication of Road Traffic Offences (AARTO) Act, was promulgated. It provides for a points demerit system and the suspension of driving licenses of repeat traffic offenders. The intention is for infringements and offences to be viewed as different categories, with infringers being dealt with administratively and traffic offenders (those of commit serious offences like drunk driving or reckless driving) going to court. Once drivers reach the threshold of 12 demerit points, the license will be suspended, and once suspended three times, the driver must re-apply for a driver's license. The necessary amendments to AARTOA and the Road Traffic Regulations have been drafted.

In terms of regulation and control of public transport vehicles, and in particular the minibus taxi industry, enforcing the regulations is lacking. The White Paper on Transport Policy and the subsequent Acts and Regulations is clear on the fact that road based public transport operations should be regulated and in terms thereof the objective of the government is based on competition for a route in the case of subsidised commuter bus contracts. In the case of minibus taxis the planning authority will determine the number of operating licenses required to satisfy the demand on a route and will issue the licenses in terms thereof.

In an environment where regulation is part of Government policy, it is clear that it can only be implemented successfully if it is accompanied by a strict enforcement regime. A two-pronged approach was followed to get to the desired state regarding operating licenses, namely i) converting radius based permits to route based permits and ii) converting route based permits to operating licenses. There was also a moratorium placed on the issuing of new permits/operating licenses at the time.

The Gauteng Transport Registrar was tasked to register all the taxi associations and the Gauteng Operating License Board was tasked with overseeing and managing the conversion process. To date it has approved 22 679 of a possible 42 451 applications for the conversion process and rejected 4 229 applications. It turned out to be much more complicated in practice as a number of conflicting routes were identified and the general record keeping was such that some legitimate operators did not appear to have legitimate permits. This created some degree of mistrust between the minibus taxi industry and the government.

This process led to some degree of confusion amongst transport operators and law enforcement, whereby minibus taxi operators were fined for not having a permit to operate a certain route while the conversion process was still being processed.

The establishment of the Provincial Regulating Entity is envisaged for 2012 and will have far reaching implications for public transport regulation and operations. It is envisaged that it would be administered primarily by GDRT officials and would be better capacitated to deal with the issuing of taxi and bus operating licenses, converting permits to operating licenses and regulating public transport operators.

There is also the need for closer working relations between AARTO, Gauteng Department of Roads and Transport (GDRT) and the Gauteng Department of Community Safety (GDCS). The Gauteng Traffic Police and Transport Inspectorate are functions of the Gauteng Department of Community Safety, and are the custodians of the traffic, overload control, and public transport enforcement.

The GDRT and GDCS needs to review the Provincial Public Passenger Road Transport Transport Act to address the latest requirements on traffic, public transport, and overload control enforcement.

18 ACCESSIBLE TRANSPORT

18.1 Policy Framework

Lack of physical access, both to and within built environments, is a major factor contributing to the ongoing exclusion of people with disabilities from mainstream society. The accessibility of built environments concerns how easily, safely and equally people with special needs or impairments can use buildings, facilities and constructed spaces. Physical

and other barriers discriminate against some people by not allowing them to move freely and independently within their built surroundings (SAHRC, 2002). The Gauteng Provincial Disability Rights Policy addresses Universal Barrier-Free Access with the objective of all persons with disabilities having equal access to the physical built environment and to other facilities and services provided for or open to the general public in rural and urban areas.

The vision of the Gauteng Provincial Government through the Disability Rights Policy is to attain a Province that includes people with disabilities to such an extent that they effectively contribute to its economic, social, cultural, and political life with the full enjoyment of human rights together with able-bodied persons.

The supporting legislative and policy framework for Accessible Transport includes:

- The Constitution, 1996
- White Paper on National Transport Policy, 1996
- White Paper on Integrated National Disability Strategy, 1997
- Promotion of Equality and Prevention of Unfair Discrimination Act, 2000
- Towards a Barrier-Free Society, South African Human Rights Commission Report, 2002
- DOT Draft Short-Term Strategic Framework on Accessible Transport, 2003
- Public Transport Strategy and Action Plan, 2007
- Signatory to the UN Convention on the Rights of People with Disabilities, 2007
- The National Land Transport Act, 2009
- The Disability Rights Policy of the Gauteng Provincial Government, 2010
- The Implementation Strategy to guide the Provision of Accessible Public Transport Systems in South Africa, 2011

An Accessible Transport System is for a transport system in which the mainstream services can be used by all people, to the greatest extent possible, without the need for further adaptation or specialised features beyond those provided as standard and for the mainstream services to be complemented by dedicated services that provide for those people for whom the mainstream services do not meet their needs. The primary objectives of Accessible Transport are to:

- Provide independent travel options
- Provide full integration into society
- Provide access to socio-economic opportunities
- integrate accessible transport into the transport system
- promote the provision of accessible transport across all modes
- provide a barrier-free public transport service and related infrastructure

The National Land Transport Act, 2009 (Act No 5 of 2009) states that the Minister may, after consultation with the MECs, make regulations relating to: *"requirements and timeframes for vehicles and facilities to be made accessible to persons with disabilities, including principles of accommodating such persons in the public transport system".* This was achieved through the Public Transport Strategy and Action Plan, 2007.

18.2 Accessible Transport and Universal Design

The Accessible Public Transport Strategy (DOT, 2011) defines passengers with Special Categories of Need as People with disabilities, the Aged, pregnant women, young children, those who are limited in their movements by children, signage passengers, female passengers, and load carrying passengers. The purpose of the Implementation Strategy is to provide guidance to the implementation of the Public Transport Strategy and Action Plan.

The concept of Universal Design is for the design of the products and environments to be such that they are useable by all people, to the greatest extent possible, without the need for adaptation or specialised features. The provision for universal design is not a once off project but a continuous program and therefore requires dedicated capacity to administer the program at Provincial and Municipal spheres of Government. Further, the provision of a barrier-free built environment must be the norm and not an exception.

Seven principles relating to universal design are generally accepted. These principles, as indicated in the **Table 18.1**, address only the aspect of universally useable design. The practice of design involves more than a consideration of usability, and should therefore also take into account other considerations such as economics, engineering, culture, gender and environmental concerns.

Table 18.1 – Principles for Universal Design
(Source: The Centre for Universal Design, 1997, The Principles for Universal Design Version 2.0)

Principle	Guideline
1 Equitable Use The design is useful and marketable to people with diverse abilities	• Provide the same means of use for all users: identical whenever possible; equivalent when not • Avoid segregating or stigmatizing any users • Provisions for privacy, security, and safety should be equally available to all users • Make the design appealing to all users
2 Flexibility in Use The design accommodates a wide range of	• Provide choice in methods of use • Accommodate right-or-left-handed access and use

Principle	Guideline
individual preferences and abilities	• Facilitate the user's accuracy and precision • Provide adaptability to the user's pace
3 Simple and Intuitive Use Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration levels	• Eliminate unnecessary complexity • Be consistent with user expectations and intuition • Accommodate a wide range of literacy and language skills • Arrange information consistent with its importance • Provide effective prompting and feedback during and after task completion
4 Perceptible Information The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities	• Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information • Provide adequate contrast between essential information and its surroundings • Maximise "legibility" of essential information • Differentiate elements in ways that can be described (i.e. make it easy to give instructions or directions) • Provide compatibility with a variety of techniques or devices used by people with sensory limitations
5 Tolerance of Error The design minimizes hazards and the adverse consequences of accidental or unintended actions	• Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated or shielded • Provide warnings of hazards and errors • Provide fail safe features • Discourage unconscious action in tasks that require vigilance
6 Low Physical Effort The design can be used efficiently and comfortably and with a minimum of fatigue	• Allow user to maintain a neutral body position • Use reasonable operating forces • Minimise repetitive actions • Minimise sustained physical effort
7 Size and Space for Approach and Use Appropriate size and space is provided for approach , reach, manipulation, and use regardless of user's body size, posture or mobility	• Provide a clear line of sight to important elements for any seated or standing user • Make reach to all components comfortable for any seated or standing user • Accommodate variations in hand and grip size • Provide adequate space for the use of assistive devices or personal assistance

18.3 Implementation

Key interventions for each of the principal elements of the public transport based travel chain are shown in **Table 18.2**, which forms the basis of the GDRT Accessible Transport program.

Table 18.2: Key interventions to provide improved accessibility to public transport
(Source: Accessible Public Transport Strategy, DOT, 2011)

Principal Elements of the Travel Chain	Key Interventions
Transformation of operational context and support	• Primary responsibility to plan, implement and manage integrated public transport networks and travel corridors to be for the municipal sphere of government • All personnel involved with planning and providing public transport to have received relevant training • Integrated electronic fare payments system to be introduced • Concessionary fares to be available to certain categories of passengers
Passengers Information	• Pre-travel information to be available (static and real-time) • In-travel information to be available throughout the journey comprising directional and service related information (static and real-time)
Infrastructure	• Sidewalks to public transport facilities to be accessible and in good condition • Stops, stations and interchanges to be accessible in layout and provided with appropriate facilities for their size
Vehicles	• New vehicles to be accessible to as many different categories of passengers as can reasonably be accommodated from dates to be specified that will depend upon the type of vehicle and its usage • Existing vehicles to be made more accessible to ambulant passengers from dates to be specified that will depend upon the type of vehicle and its usage
Communication and marketing	• Capacity building and participation of interested and affected parties in the planning, implementation and monitoring of public transport services • Development of awareness of fundamental rights to promote a climate of understanding, mutual respect and equality • Market the improvements made to public transport so as to provide and give confidence in its use

The Gauteng Provincial Disability Rights Policy commits to People with Disabilities with a specific view on Accessible Transport. The GPG commits to making public transport accessible for people with disabilities by undertaking the following interventions:

- Involving people with disabilities in the development and implementation of a comprehensive and integrated transport system, including public transport.
- Integrating the needs of people with disabilities in the design and construction of new roads and in the upgrade of the existing road infrastructure.
- Preventing new disabilities by aggressively pursuing road safety programmes using communication tools that are also accessible to people with various disabilities.
- Adoption of norms and standards on the construction of the transport infrastructure that is accessible to people with disabilities.

The following short term interventions should be considered by the GDRT in the five-year implementation plan:

- Review subsidised public transport contracts based on rationalised routes and services, and which incorporates green bus technologies, integrated fare collection technologies, and universal design features. This will affect the exterior, entrance and interior designs of public transport vehicles including rail, bus, and mini-bus taxi. Such accessible features are to be effected by reviewing the subsidy contract/tendering system and using it as leverage. This will be the case particularly with the bus and rail transport. Accessibility requirements are specified in the DOT Model Tender and Contract documents for subsidised bus services, published in the Government Gazette No 29106 of 8 August 2006. However, the contract only covers Class 1 improvements. Class 1 improvements are features that increase the accessibility of a transport system to all life cycle and impairment passengers, but not those who use wheelchairs. Such improvements include small design changes in vehicles (such as installing sufficient grab-rails, or using high-contrast colours on steps and hand-holds to improve visibility), improved infrastructure (such as sheltered and safe bus stops), and improved operational practices (such as keeping the vehicle stationery until elderly and disabled passengers are seated). Class 1 improvements also include the training of drivers to be sensitive to the needs of people with disabilities. Class 2 improvements are features that allow wheelchair users to board and ride vehicles in their wheelchairs. This is usually achieved through a combination of vehicle and infrastructure improvements, such as low-floor buses with sufficient kerbs, or high-floor buses with wayside platforms.
    - Provide institutional capacity for Accessible Transport at GDRT for Policy, Research, Standards and Guidelines, Implementation, Engagement, and Monitoring for Accessible Transport. Non-motorised Transport may form part of this portfolio.
    - Proper information system, signage, and communication structures (before and during the journey)
    - Ensure that universal access design standards are applied on all new public transport facilities, public transport vehicles, and NMT infrastructure
        - Public Address Systems and Tactile Ground Surface Indicators at road crossings and public transport facilities.
    - Representation on the Gauteng Transport Commission/Authority
    - Research the universal access demand/needs for the GCR
    - Determine the need to transform all bus and taxi vehicles to accommodate Class 2 type service
    - Awareness Program through the Passenger Charter, Marketing and Communications
    - Implement concessionary fares for People with Disabilities

- Adoption of existing standards and guidelines
    - Tactile Ground Surface Indicators (TGSI) standard design drawings developed for the City of Tshwane BRT Specialist Office (which is also under consideration by the DOT for national application)
    - World Bank BRT Accessibility Guidelines
    - Design Guidelines to improve the Accessibility of Commuter Rail in South Africa.
    -

19 ROAD SAFETY

19.1 Background

Road safety was identified by the World Bank and World Health Organisation (WHO) as a health and safety priority in 2009. WHO also projected that by 2020, road collisions will place the third highest burden on healthcare worldwide and that traffic fatalities will be the 6th leading cause of death worldwide and the second leading cause of disability-adjusted life. However, despite this the cost of crashes in South Africa is still high with around R43 billion spent annually, with the loss of around 15,000 lives and 7,000 permanent disabling injuries.

According to the WHO a safe road traffic system is one that accommodates and compensate for human vulnerability and fallibility. Road users include pedestrians, cyclists, motorists, their passengers, and passengers of on-road public transport (mainly taxis and buses). Road safety therefore requires methods and measures for reducing the risk of being killed or seriously injured for not just one group of users but for all the groups (as listed above) using the road network.

Trends around the world indicate that road user behaviour has been identified as the largest contributing factor to the lack of road safety progress in many countries. 95% of crashes follow violation of some kind, most of which involve inappropriate speed, alcohol, unsafe overtaking, unsafe pedestrian behavior and failure to wear seat belts. As such transport authorities in South Africa are also faced with the difficulty to change this behavior among people.

The Planning for 2014 – Making the Future Work Today report by the Gauteng Provincial Government reiterated that Road safety remains a problem in Gauteng, with road deaths still too high.

The following sections briefly give the status quo on road traffic accidents in Gauteng based on the latest Road Traffic Report by the Road Traffic Management Cooperation (2011). The statistics were recorded over a 12 month period from 1 April 2010 to 31 March 2011. The 2009/2010 period statistics is also provided.

19.1.1 Statistics

The number of fatal crashes for the Gauteng province is provided in **Table 19.1**.

Table 19.1 – Road Crashes in Gauteng

Year	Crashes	Fatalities
2009/2010	2 153	2426
2010/2011	2 008	2318

Fatal crashes have decreased by 7% over the same period from the previous year, and fatalities have decreased by 5% over the same period from the previous year.

The road user groups involved in fatal crashes is indicated in **Table 19.2**.

Table 19.2 – Fatalities by User Group in Gauteng

User Group	2009/2010		2010/2011	
	Total	%	Total	%
Drivers	759	31	766	33
Passengers	553	23	567	24
Pedestrians	1114	46	985	42
Total	**2 426**		**2 318**	

Pedestrians accounts for a disproportionately high share of road fatalities. Pedestrian road users comprise about 42 per cent of all road fatalities in Gauteng. Further, most pedestrian crashes involve children.

The type of vehicles involved in crashes in Gauteng is indicated in **Table 19.3**. The majority of crashes involved cars. Public transport vehicles comprising of bus and taxi vehicles make up 10% of fatal crashes.

Table 19.3 – Vehicle Type involved in Crashes in Gauteng

Type of Vehicle	Number of Crashes	% of Total
Motorcars	1 185	57
Minibus Taxi	180	9
Buses	23	1
LDV's	242	12
Trucks	142	7
Motocylces	77	4
Other and Unknown	180	9
Bicycles	42	2
Total	**2 017**	**100**

19.1.2 Deduction

The main challenges and deficiencies to achieving safety on Gauteng roads may be ascribed to the lack of a comprehensive and continuous Road Safety Program by the Gauteng Provincial Government. The Road Safety program requires dedicated engineering, communication, enforcement, and emergency services resources.

These challenges and deficiencies from a lack of a comprehensive and holistic Road Safety program implies that road safety does not receive adequate priority by the Gauteng transportation authorities. Activities are carried out on an ad hoc basis and are founded upon perceptions instead of the facts. The general approach to road safety is enforcement; however, there are several other initiatives necessary for a comprehensive road safety program.

However, SANRAL has taken broad steps to improve road safety on the national roads by addressing overload control, visible policing, incident management programs, engineering improvements, routine maintenance, and more recently ITS applications.

19.2 Policy and Legislative Framework

Policy, legislation, and regulation covering South Africa's roads are comprehensive and compares favourably with other leading countries in the world. Road Safety Strategies are also published on a regular basis, and include recommendations from the World Health Organisation and global best practice. However, the challenge is the implementation of the strategy.

Road Safety is a competency of the Gauteng Provincial Department of Roads and Transport. The Road Traffic Management Corporation (RTMC) was set up by the DoT, as the lead organisation to promote road safety nationally working with Provincial and Local Government to ensure a cooperative approach particularly with enforcement. The DoT is also active with the Arrive Alive Campaign that is emphasised during the festive seasons and school holidays. The Arrive Alive Campaign is a communications driven initiative for Road Safety.

19.2.1 National Road Safety Strategy (2006)

The Road to Safety Strategy aims to reduce crashes, deaths and injuries by 5% every year. The strategy is driven by the need to find answers to a set of clear interlocking problems across the whole spectrum of road safety and traffic management. It requires that systematic attention be paid to upgrading road infrastructure and signage on the basis of continuous audits of hazardous locations and crash red-spots. It requires that drivers be fit to drive and vehicles fit to use the roads.

The Strategy strengthens regulation of road-based freight and public transport modes and encourages the implementation of vehicle safety technologies that are proven and appropriate to South Africa circumstances. It intensifies road safety communication

campaigns and builds public-private partnerships and new forms of community participation that will ensure the long-term sustainability of all government-led road safety initiatives.

19.2.2 Administrative & Adjudication of Road Traffic Offences Act

In an attempt to improve road safety in general on the roads, the Administrative Adjudication of Road Traffic Offences (AARTO) Act was promulgated. It provides for a points demerit system and the suspension of driving licenses of repeat traffic offenders. The intention is for infringements and offences to be viewed as different categories, with infringers being dealt with administratively and traffic offenders (those of commit serious offences like drunk driving or reckless driving) dealt with criminal charges. Once drivers reach the threshold of 12 demerit points, the license will be suspended, and once suspended three times, the driver must re-apply for a driver's license. The necessary amendments to AARTOA and the Road Traffic Regulations have been drafted.

19.2.3 South African Road Safety Manual

The South African Road Safety Manual (SARSM) is a guideline that was produced to implement road safety audits. The purpose of Road safety audits according to SARSM is to:

- Minimise the severity and accident risk of road traffic accidents that may be influenced by the road facility or adjacent environment.
- Minimise the need for remedial measures after the opening of a new road project
- Reduce the full life-cycle cost of a road project by reducing its accident cost
- Create and maintain an awareness of safe design practise during all the stages of a road project

19.3 Development of a Comprehensive Road Safety Plan

Best-practice road safety plans focus upon the prevention of serious injury and death crashes in spite of human fallibility (which is contrasted with the old road safety paradigm of simply reducing crashes assuming road user compliance with traffic regulations). Safe road design is now about providing a road environment which ensures vehicle speeds will be within the human tolerances for serious injury and death wherever conflict points exist.

Although the provincial government currently does tend to address road safety issues in various ways there is a lack of a direct and dedicated champion and accountability for road safety outcomes. It is proposed that the province identify a lead champion in the province to guide the provincial road traffic safety effort.

International best practices have shown that the key focus areas to address road safety are:

- Education
- Enforcement
- Engineering & Data Capturing
- Emergency Services

Based on the main problems identified as part of the status quo assessment above a number of strategies have been identified that the Province need to implement to promote road safety in Gauteng. The Road Safety Program is not a once off project but a continuous program with dedicated resources in the GDRT. Projects that the province need to prioritise under each of the four focus areas are discussed further.

19.3.1 Education

Many of the poor communities are also marginalized by low literacy levels, hence road safety educational and communication programmes needs to be dynamic and simplified. The following programs are recommended:

- Road safety education at schools
- Reflective armband programme
- Media campaigns in the local language
- Training and monitoring of volunteers such as scholar patrols
- Community Outreach Programme - communities taking ownership of road safety programmes.
- Establish Community Based Road Safety Workgroups

19.3.2 Engineering & Data Collection

(a) Development of Integrated Walking and Cycling Networks

The main reason why pedestrians account for almost half of the fatalities by user group is attributed to the inadequate separation and or integration of appropriate pedestrian support infrastructure in road designs. Throughout the province there is inadequate pedestrian walkways through interchanges, lack of continuity between walkways on bridges and municipal pedestrian facilities, poor lighting, lack of signage, broken protective devices such as fences and guard rails, etc.

The creation of networks of connected and convenient pedestrian and cyclist routes can lead to greater safety for NMT. Safer routes, typically, consist of footpaths, sidewalks and

cycle tracks separate from the mainstream roadway. These may be easily resolved through proactive design and road safety audits.

(b) Road Safety Audits

Road safety audits identify hazardous locations and assist in improving the safety elements of the road network through low cost engineering. It is evident that basic road furniture such as fences, guardrails, road signs, paint markings, etc., is missing and compromise road safety. Road Safety Audits consider the following Engineering elements:

- Geometry – Alignment, Cross section, Access, Sight distance
- Road Furniture - Guardrails, steel ropes, and other barriers, Fencing, Kilometre Markers, Road Signs, Lighting, Road Studs
- Bridges - Width, Height, Guardrails or balustrades
- Escape ramps
- Environment - Pedestrians and Animals Terrain, Sight Distance, Weather and Pollution, Ribbon Development, Advertising, illegal developments and activities in the road reserve, illegal access, etc
- Pavement Conditions - Surface Conditions (patches, potholes, edge breaks, bleeding), Riding quality, Skid resistance and Drainage, Structural Deformation, Provision of shoulders, etc

(c) Area wide Traffic Calming Master Plans

Traffic Calming is also a significant traffic management concept. The objective of traffic calming measures is to moderate traffic behaviour, through physical and legislative interventions, with the aim to reduce vehicle speeds, and/or travel patterns contributing to a safer road environment, but with due regard to mobility and accessibility.

It seems like whenever the public/community complain about high-speed traffic or road safety, the common approach is to implement speed humps. Councillors, officials, and engineers must understand the application of Traffic Calming, and where and when to apply traffic calming measures.

The actual speed in urban areas, where car traffic and pedestrians co-exist, is of vital importance when it comes to road safety for pedestrians. Firstly the speed at which a car is travelling influences the capacity of the driver to observe pedestrians and safely stop without causing a crash. Secondly, the car speed also determines the severity of injuries sustained by a pedestrian in a crash. Most countries apply area-wide traffic calming measures as opposed to isolated street traffic calming. This diverts fast through traffic from

collector to arterial routes that are appropriately designed for higher vehicle volumes. The benefit of master planning is that it is pro-active and can be used in motivating for capital funds. Ad hoc implementation of traffic calming has widespread implications and can at times cause additional problems.

Traffic calming investigations should be done with the participation of the Ward Councillor and the community.

19.3.3 Enforcement

The general trend for Road Safety is focused on Enforcement. However, enforcement focuses excessively on speed enforcement whilst vehicle roadworthiness, driver behaviour, overloading, visible policing, etc., are not emphasised. Public transport vehicles also account for a significant number of fatalities in Gauteng. There is a dire need for effective law enforcement to curb the unroadworthy public transport vehicles and dangerous driver behaviour on the roads.

Accident reporting, and data collection and processing in the Province is not efficient. The implementation of Law Enforcement programs should be informed with empirical data. The following projects are recommended:

- Development of Incident Management System for specific corridors
- Development of a database for Officer's Accident Reports (OAR) forms
- Collaborate with traffic engineering officials at Local Municipalities to collect speed data and implement speed enforcement accordingly
- Implement red-light violation cameras at strategic points on the network
- Implement frequent roadblocks to address driver behaviour, vehicle roadworthiness, overloading, etc.

19.3.4 Emergency Services

Currently emergency services between public and private service providers are fragmented. There is need to set up co-ordination channels for all emergency service providers (private and public), as part of the Incident Management System (IMS). There is significant lessons learned from the IMS program developed by SANRAL. There is also the potential to utilize the SANRAL Central Communication Centers on the current national road network in Gauteng.

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