8.1 Introduction

This chapter provides a holistic view on passenger transport modes focused on corridors of national importance, highlighting the current utilisation of and demand for services and infrastructures as well as the current realities faced in passenger transport. It also provides a framework for strategic recommendations and proposes key interventions.

The passenger transport situation in South Africa demands a carefully planned modal shift strategy that addresses widespread dissatisfaction with passenger transport services. South Africa has seen exponential growth in car ownership over the past few decades as the middle class grows, while the passenger transportation system has not improved sufficiently to match passenger expectations and is not sufficiently demand- and development-driven. Both the White Paper on National Transport Policy, 1996 and the Moving South Africa Action Agenda, 1999 (MSA) promote the use of public transport over private vehicle transport and set a goal of achieving a ratio of 80:20 between public transport and private vehicle transport usage. In the nearly 20 years since the publication of the White Paper and the MSA, the shift towards public transport has not taken place.

Our passenger transport system is broadly inefficient and not sufficiently customer-focused and has poor levels of reliability, predictability, comfort and safety, with the exception of the Gautrain and the newly implemented bus rapid transit (BRT) systems in selected metropolitan municipalities. It does not reflect the world-class aspiration of the NDP 2030 of an integrated passenger transport system and access to opportunities for all.

The fragmented nature of institutional governance over passenger transport is also not helpful. The scope of passenger transport encompasses sustainable forms of transport, including non-motorised transport (NMT) in South Africa’s urban and rural contexts. The existing arrangements are not sustainable in terms of energy consumption, environmental impact and road safety.

8.2 The Situation Today

Nearly two decades after the publication of the White Paper on National Transport Policy in 1996, passenger transport in South Africa still suffers from inefficiencies and is not adequately focused on the customer. The levels of reliability, predictability, comfort and safety are still poor in certain areas. Accessibility to services and universal access are also a challenge.

The NDP 2030 states that, by 2030, passenger transport should be user-friendly, less environmentally damaging, more affordable and integrated or seamless. This aspiration is, however, hampered by the fragmented nature of institutional governance in passenger transport.

According to the National Household Travel Survey (NHTS) of 2003 and that of 2013, the passenger transport system is not sustainable under the current operating and management practices. The low profitability levels negatively impact on the capacity of private operators to adequately maintain and recapitalise their fleets. Unhealthy competition among modes also distracts from the spirit of partnership in the passenger transport sector. This, in turn, results in an unfortunate downward cycle of poor quality services, minimal investment in services, poor market perception, and an increase in the use of private vehicles.

Accessibility to passenger transport services is also a major challenge, particularly in the rural areas. A large proportion of scholars and workers have no alternative in rural areas other than to walk to their destinations. One of the key reasons for this is due to passenger transport services’ being planned according to demand-responsive principles. In other words, passenger transport is provided when there are sufficient passengers and the state does not object to the subsidy requirements. A shift in transport ideology is required, as explained in Chapter 1, where passenger transport is provided, where developmental and transformative approaches are included in the planning process.

The passenger transport system is not effectively integrated across all modes and trip interchange segments. The ineffectiveness includes a lack of coordination in services scheduled, facilities and infrastructure along strategic priority corridors, and the fragmentation of regulatory authority in the sector.

The implementation of intermodal transfers, fare structure, and the integration of an integrated ticketing systems are generally not possible in the current passenger transport system. Some progress has been made towards solving this issue where BRT systems have been implemented. Modal options are limited, particularly among low-income households, and result in the poorest of the poor often having no choice other than to use the most expensive form of passenger transport.

Inappropriate modes are used along key corridors and the demand for subsidised passenger transport services usually outstrips the available capacity. Regardless of the cost implications and distances, passengers who are able to afford rail or bus services revert to taxis, due to the flexibility and, in some instances, lower cost of that service. In circumstances of higher volumes and longer distances, bus and rail transport are more sustainable and cost-effective. A well-integrated passenger transport system, characterised by appropriate modes for specific corridors, is critical in improving the affordability levels. According to the NHTS, a high proportion of the poor in 2003 spent more than 10% of their income on passenger transport. This percentage has doubled in most modes, according to the 2013 NHTS.

Goverance and operational structures are still fragmented, resulting in complex regulations and by-laws and a subsequent lack of uniform safety and operational compliance standards. This restricts the government’s capacity to cope with its social support responsibilities – government subsidies are neither balanced nor evenly distributed geographically, and, hence, limited to local or short-distance services.
In the passenger rail sector, service capacity is under pressure due to aging rolling stock and infrastructure. Infrastructure capacity is also negatively affected by a lack of good maintenance practices and upgrades to lines and signal systems.

PRASA has, however, begun a turnaround strategy in 2010, investing significantly in new rolling stock, signalling and infrastructure. It will take some time, though, before the benefits of the investment are clearly seen by the travelling public.

In many cases, especially in rural areas, passengers do not have any modal choice and is either a captured market or stranded without any public transport.

Despite this prognosis, SIP 7, the Integrated Urban Space and Public Transport Programme, aims to coordinate planning and the implementation of public transport, human settlement, economic and social infrastructure and location decisions into sustainable urban settlements connected by densified transport corridors. More recently, SIP 2 and SIP 7 have identified the following projects for consideration and implementation, reflecting progress in the passenger transport sector:

- Johannesburg–Durban high-speed passenger rail
- Rea Vaya integrated rapid public transport network– Johannesburg
- My Citi integrated rapid public transport network– Cape Town
- Nelson Mandela Bay integrated rapid public transport network
- eThekwini integrated rapid public transport network– Durban
- Rustenburg integrated rapid public transport network– Rustenburg
- Tshwane integrated rapid public transport network– Tshwane
- Buffalo City integrated rapid public transport network– East London
- Ekurhuleni integrated rapid public transport network– Ekurhuleni
- Mangaung integrated rapid public transport network– Bloemfontein
- Mbombela integrated rapid public transport network– Nelspruit
- Msunduzi integrated rapid public transport network– Pietermaritzburg
- Polokwane integrated rapid public transport network– Polokwane.
8.3 Current Passenger Transport Trends

This section describes trends in passenger transport between 2003 and 2013 based on the National Household Travel Survey (NHTS) of 2003 and that of 2013. The NHTS categorises the main purpose of trips as follows:

8.3.1 Why do South Africans travel?

Figure 8-1 illustrates the main trip purpose split for South Africa. It shows that more than half of trips are made for education purposes, followed by work trips.

8.3.2 How many trips are made for a variety of trip purposes?

In many cases, especially in rural areas, passengers do not have any choice in passenger transport and, therefore, have to walk. Figure 8-2 shows the number of trips per trip purpose and mode for the country. Walking is clearly the main mode of transport used for education trips, whereas private car is the main mode for work trips.

In the 2003 NHTS, business trips were not included in the questionnaire. Thus, changes in mode choice and trip purpose for all trips cannot be fully interrogated.

The figure shows that the number of trips made by train is low compared to minibus taxi and private car, with the bus mode notably higher. This trend might be attributed to the provision of subsidised bus services in and around metropolitan areas and towns with mining-related economies and the advancement of BRT services.

8.3.3 Work trips generated per province

Table 8-1 demonstrates the change in percentage of work trips per province between 2003 and 2013. The percentage contribution per province to the total number of trips in South Africa as a whole did not change significantly from 2003 to 2013. The main contributors to the overall work trip movements are Gauteng, KwaZulu-Natal and the Western Cape (70% in total). These provinces are home to many metropolitan municipalities, including those of Johannesburg, Tshwane, Ekurhuleni, eThekwini and Cape Town. Mpumalanga and the North West account for approximately 20% of work trips, and the remaining 10% are generated in the Northern Cape, the Eastern Cape, the Free State and Limpopo.

<table>
<thead>
<tr>
<th>Province</th>
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<th>2013</th>
</tr>
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<tbody>
<tr>
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<td>14</td>
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<tr>
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<td>7</td>
<td>7</td>
</tr>
<tr>
<td>NORTHERN CAPE</td>
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<td>1</td>
</tr>
<tr>
<td>FREE STATE</td>
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<td>4</td>
</tr>
<tr>
<td>KWAZULU-NATAL</td>
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<td>NORTH WEST</td>
<td>9</td>
<td>7</td>
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<td>MPUMALANGA</td>
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<td>8</td>
</tr>
<tr>
<td>LIMPOPO</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 8-1: Number of annual travel trips in 2013 (Source: NHTS, 2013)
FIGURE 8-2: NUMBER OF ANNUAL TRAVEL TRIPS IN 2013 BY PURPOSE AND MODE (Source: NHTS, 2013)
FIGURE 8-3: MODAL SPLIT OF WORK TRAVEL (Source: NHTS, 2003 & 2013)
8.3.4 Transport mode split for work-related journeys

Figure 8-3 indicates the percentage passenger transport mode split for work-related trips between 2003 and 2013 per province. The noteworthy changes in mode split per province are:

- **Western Cape:** Train and bus utilisation increased from 2003 to 2013, while taxi use decreased notably over the same period. Bus use increased by 6% and use rail by 3%, contributing to a decrease in taxi usage by approximately 10%. The increase in bus mode utilisation might be due to the implementation of the BRT, but must be confirmed by means of a detailed analysis.

- **Eastern Cape:** Taxi use increased by 6% and bus use decreased by 5%. No changes where noted in the utilisation of trains. This implies a direct modal shift.

- **Northern Cape:** No significant mode shifts were identified.

- **North West:** Train utilisation reduced from 6% to 0% and bus utilisation increased slightly from 30% to 33%.

- **Free State:** Taxi utilisation decreased by 3%, whilst trips taken by bus increased by 3%. The total number of trips on passenger transport remained the same for the 10-year period. This might be an indication of a modal shift from passenger transport modes to private car use but further investigation will be required to confirm this assumption.

- **KwaZulu-Natal:** The utilisation of taxis increased by 10%, while that of buses decreased by 10%. These are significant changes, seeing that the total number of trips for passenger transport modes increased in the province by 1% per year over the 10-year period.

- **Gauteng:** No significant changes occurred in Gauteng. The implementation of the Gautrain and BRT systems might have had an impact on the utilisation of bus services but this will only be visible from the next NHTS (2018).

- **Limpopo:** No significant changes occurred in Limpopo.

- **Mpumalanga:** Taxi utilisation decreased by 3% and bus mode utilisation increased by 3%. The total number of trips by passenger transport increased over the 10-year period.

8.3.5 Passengers per mode and province to work trips

A comparison of how the passengers per mode and province to work trips have changed between 2003 and 2013 demonstrates the following (also see Figure 8-4):

- The total number of trips made in the Western Cape, KwaZulu-Natal, Gauteng, Mpumalanga and Limpopo increased, indicating that passengers still use passenger transport but with a shift in the specific mode as per the discussion above.

- Passenger transport trips in the North West decreased significantly, which might be linked to a decline in economic activity in the province, emigration to other provinces, or insufficient passenger transport services or the poor quality of such services, where they exist.

These results demonstrate that the use of passenger transport is growing in certain provinces as a result of policy implementation, but not as fast as expected by the NDP 2030 or IRPTNs.

No metro-rail services are provided in the Northern Cape, the Free State, the North West, Mpumalanga and Limpopo.
8.3.6 Main modes of travel to work in relation to monthly income

Figure 8-5 provides insight into the main modes used to travel to work in relation to monthly income and how such travel has changed between 2003 and 2013. The NHTS of 2013 provides income categories per month in 5 quintiles (5=highest and 1=lowest). The table shows that high-income earners travelling to work do so mainly by car (66%), whereas low-income earners do so predominantly on foot (42%) and by taxi (25%).

8.3.7 Monthly commuting cost comparison between modes

To add further weight to these findings, Figure 8-6 illustrates the monthly commuting cost comparison between modes. It shows that the costs have nearly doubled from 2003 to 2013. A concerning fact is that 70% of South African passengers are spending at least 30% of their income on transport. This high travel cost adds to the inability of a large portion of the population to access opportunities and jobs. Figure 8-7 illustrates that, in compact cities with a strong bias towards passenger transport, the local GDP spend is much less on the provision and use of transport with significantly greater social and economic benefits. Cities with urban sprawl and low density tend to spend much more on transport as a percentage of the GDP with much fewer social and economic benefits. The emphasis, therefore, needs to be on integrated land use and transport planning, forcing more compact cities to drive down transport cost.
8.3.8 How do scholars get access to educational centres?

Figure 8-8 indicates an increase in private car use to access educational centres, which indicates that passenger transport strategy and policy have not been optimally effective. It also shows that walking remains the main mode of travel to education facilities in urban and rural areas as well as in metros and South Africa as a whole.

Turning to scholar transport, Figure 8-9 indicates that there has been a decline in scholars’ walking to school or place of instruction, a slight growth in bus and train use, and a rather significant growth in minibus taxi and private car use.

Eighty-three per cent of scholars use either NMT (64%) or passenger transport (20%) to access institutions of learning. These statistics demonstrate the significant role of passenger transport and NMT (as opposed to private car and rail use as an important mode of travel to scholars).

In terms of the percentage of scholars walking all the way with a walk time in excess of 60 minutes, Figure 8-10 illustrates an increase of 1.3% in rural areas. Despite policy intent, there is no national overarching strategy that comprehensively situates NMT as central to future transport provision and as a key component to spatial development to reduce walk distances or alternative modal options in rural areas.

Although high percentages of scholars use NMT and passenger transport to access institutions of learning, no integrated solution has been defined to enhance the safety or reliability of these services. Scholar passenger transport (buses) is provided through the Department of Education and not the Department of Transport, which results in a disjointed provision of services. A policy decision is required between the Departments of Transport and Education to establish the most socio-economic solution to this challenge. The central questions being grappled with are: “is this a transport or education problem?”, “is the solution a transport solution or an education solution”, or both?
8.4 Passenger Transport Realities

8.4.1 Passenger service utilisation

The passenger transport system is characterised by poor levels of service as to matters such as reliability, passenger safety, and cost. There is, therefore, general dissatisfaction with passenger transport services.

The current strategy, which targets lower-income segments of the market, results in low profitability levels and impacts on the sustainability of the passenger transport system. Along many critical corridors, taxis are the only available mode to many passengers (average market share of over 70% in the overall local passenger market) (see Figure 8-11). Low demand is also unattractive to large corporate operators, as the returns on investment are simply too small.

Captive commuters represent the largest proportion of the passenger transport market – many workers walk to work, spending longer than 30 minutes per trip. The current passenger transport system is characterised by intermodal competition, disintegration, and poor usage of the rail mode. Taxis operate on routes where buses should operate, and buses operate where rail services should operate – resulting in the national modal share profile being sub-optimal.

Figure 8-12 indicates the main modal split per trip purpose according to the NHTS of 2013. No comparison can be made with the 2003 NHTS, since the specific question was not asked and no comparative data is available. Work and business trips are mainly made by private vehicle (car/truck), with minibus taxi and walking second and third highest for work trips. Educational trips are mainly made on foot, emphasising the challenges for scholars in accessing transport modes. In relation to overall trips, rail and bus play an insignificant role, emphasising the lack of public transport implementation, integration and reform.
8.4.2 Long-distance rail

The utilisation of the rail mode, especially in rural areas, is hampered by poor access, availability, reliability, distance, cost, and safety and security. Long-distance rail suffers due to old rolling stock, low demand, low profitability, and discontinued services. To improve the quality and availability of rolling stock, though, the government has committed R4 billion in the 2012 national budget for the purchase of new coaches between 2012 and 2015. The funding made available will include for long-distance coaches. **Figure 8-13** gives an overview of the Shosholoza Meyl (PRASA long-distance) services.

Failure to maintain and upgrade infrastructure, including lines and signal systems, results in a reduction of line capacity, the unreliability of services and, eventually, loss of market share. Inefficiencies in service provision can also be attributed to the disjointedness between rail line ownership and operations.

Critical issues in rail passenger transport include strategies to revive the mode in South Africa to form the backbone of transport, and how, when and where to introduce high-speed technology. In order to improve the operational capacity of the mode, there is a need to address speed and travel time, traffic and safety concerns, interoperability and integration.

Passenger rail service provision and network coverage are also limited to mainly urban areas. New network developments have stagnated over the past five decades. This has eroded the rail mode’s market share, which has declined systematically in the past few decades but is showing gains in patronage in the past few years, according to statistics reported in the NHTS of 2013.

To promote interoperability objectives, there is a need to transform the current institutional arrangements for the rail mode (government-owned, -regulated and -managed), and reverse long-term disinvestment in the rail mode, stagnation, and a resistance to technological changes (including high-speed systems and gauge). Appropriate debate about technology choice is required to ensure that the appropriate mode and technology are introduced and not a sub-optimal mode that does not support wider transport development objectives.

PRASA assessed its demand projections and published the PRASA National Strategic Plan in 2013, in which it outlines its views about appropriate modal choice, possible high-speed corridors and potential expansion to the existing network.

The proposed interventions for long-distance and rural travel in South Africa defined in the PRASA Strategic Plan 2013 are illustrated in **Figure 8-14** below. The interventions will be demand-led, with the preferred technology chosen based on demand, distance and cost.
FIGURE 8-13: CURRENT PRASA LONG-DISTANCE SERVICES (Source: PRASA)
FIGURE 8-14: PRASA: FUTURE LONG-DISTANCE PASSENGER NETWORK (Source: PRASA)
8.4.3 Road mode

The road mode (in terms of passenger transport) enjoys better operational perceptions over the rail mode. This can be attributed largely to its versatility and adaptability to market demand, adaptability to infrastructure capacity conditions (e.g. in relation to traffic congestion), and changes in route and service frequencies.

The services range from luxury tourism and long-distance to regional and locally subsidised and non-subsidised commuter services. It also includes bus rapid transit (BRT) and scholar transport services. Government influence is also prominent, particularly in relation to the regulated and subsidised bus mode, through the contracting system and the unsubsidised minibus taxi mode that is regulated through the issuing of operating licences. Minibus taxis offer more flexible point-to-point services. The fact that the road mode enjoys high user levels, despite higher fare structures, is probably indicative of commuters’ prevailing ‘captivity’. PRASA (Autopax) also runs long-distance bus services nationally. The current and proposed routes are included in Figures 8-13 and 8-14 in the rail section above, since they were included in the PRASA Strategic Plan 2013.

The minibus and bus services market share is currently more than double that of rail. There is unhealthy competition within the road passenger mode market, with minibus taxis capturing a bigger share of the market due to their versatility. Notwithstanding this, the taxi industry can perform even better if it is properly restructured, funded and regulated. (Currently, it operates within an informal system.) Whilst the taxi industry is financially viable as a business enterprise, mechanisms need to be considered to bring it into the mainstream of passenger transport to take up its rightful place in the system. The institutional arrangement is one of the main reasons why the road passenger services mode has outperformed the rail mode over a long period.

South Africa requires a strategic public transport network (SPTN) that integrates local level IPTNs and the IRPTNs allowing the passenger transport system to meet interregional and local travel needs. The SPTN should be streamlined into a detailed operational plan, business plan, financial plan, and implementation plan. All plans by planning authorities, Department of Transport agencies and passenger enterprises should be aligned with the SPTN. Suitable modes should be identified and supported to improve passengers’ connectivity and accessibility to opportunities.

Primary routes should be identified for implementation up to 2030, with secondary routes following the establishment of the backbone of the primary routes. Future technologies should be considered for implementation during the period up to 2030 with room for migration into the period beyond.

Suitable institutional arrangements that prescribe the responsibility for the provision, funding and maintenance of facilities and the operations, control and management functions of the proposed services are required. There is also a need for proposals about how national, provincial, and local governments should coordinate their planning to determine funding needs and prioritise planning actions across the provinces.

The need for provincial master plans to guide and coordinate the development and implementation of local and district ITPs and, thus, passenger transport priority is great.
8.4.4 Air passenger transport

Air passenger transport enjoys the most positive commercial image of all modes in South Africa. Its utilisation levels are high, and the infrastructure is of an exceptional standard. Currently, the utilisation levels of the scheduled services at major airports range from about 80% for domestic flights to about 70% for international flights. This can be attributed to the Airport Company of South Africa’s (ACSA’s) strategic planning, management, funding, and prioritisation processes. These high utilisation levels can also be attributed to private sector market forces and the flexibility of operations. Figure 8-15 compares the passenger numbers at South Africa’s main airports in 2011 and 2012.

The mode also enjoys a good safety record and a healthy and competitive market, regardless of the financial difficulties this sector faces. Major challenges currently faced include global competition, security and baggage theft at airports, and ACSA’s capital debt problem. The latter is attributed to the regulatory framework, which affects the cost recovery programme associated with airport expansions.

In order to promote the integration and expansion of airports and surrounding land uses, an aerotropolis approach is recommended where appropriate. ACSA and Ekurhuleni have implemented this approach at the OR Tambo International Airport, resulting in a 25-year plan, with the first 5-year implementation plan currently being approved. This approach is also being considered in eThekwini for the King Shaka International Airport, which will include the Dube Trade Port. Lessons learnt should be rolled out to other airports.

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<tr>
<th>Airport Name</th>
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<th>Passengers 2012</th>
</tr>
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<tbody>
<tr>
<td>OR TAMBO INTERNATIONAL AIRPORT</td>
<td>18922048</td>
<td>18070017</td>
</tr>
<tr>
<td>CAPE TOWN INTERNATIONAL AIRPORT (CPT)</td>
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<td>6369814</td>
</tr>
<tr>
<td>POLOKWANE INTERNATIONAL AIRPORT</td>
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<td>5065580</td>
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<tr>
<td>KING SHAKA INTERNATIONAL AIRPORT</td>
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</tr>
<tr>
<td>PORT ELIZABETH NATIONAL AIRPORT</td>
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</tbody>
</table>

FIGURE 8-15: AIR PASSENGERS (Source: ACSA)
8.4.5 NATMAP 2050 Forecasting

The NATMAP 2050 employed a demand forecasting model to estimate, from the base year (2005), the short-term (2010) medium-term (2030), and long-term (2050) growth in volumes for different modes. Figures 8-16 to 8-18 illustrate the results across the road, rail, and air modes associated with the 2050 scenario.

Figure 8-16 shows road passenger growth to be increasing in the 2050 scenario (bus and taxi modes).

Joining spatial development with increases in population growth, the figure reflects growth in passenger demand in the three main development nodes in South Africa, including the Gauteng city region, Cape Town and eThekwini.

The passenger rail system includes a metropolitan rail commuter system provided by PRASA and long-distance passenger services provided by Shosholoza Meyl, a subsidiary of PRASA. Rail passenger volumes are more complicated to validate due to the interprovincial, long-distance trips using Shosholoza Meyl, and, at the same time, to ensure the larger commuter demand in especially metropolitan areas are catered for. In considering the PRASA National Strategic Plan 2013, it is observed from Figure 8-17 that the NATMAP 2050’s predictions about passenger growth in the three metros (Gauteng, Cape Town and Durban) are valid and will see the largest increases in commuters.

Figure 8-18 illustrates the projected domestic growth in air travel. By comparing the volume of flights to available data from ACSA, it is seen that the 2030 and 2050 scenarios remain valid. The largest increases will be seen between:

- Johannesburg – Cape Town
- Johannesburg – Durban
- Cape Town – Durban
- Cape Town – East London
- Johannesburg – East London
- Johannesburg – Upington
FIGURE 8-16: TOTAL PASSENGER LINK VOLUMES (2050)
FIGURE 8-17: PASSENGER LINK VOLUMES BY RAIL (2050)
FIGURE 8-18: PASSENGER LINK VOLUMES BY AIR (2050)
8.5 Key Challenges and Issues Faced by the Passenger Transport Sector

After nearly two decades since the White Paper on Transport was published, the passenger transport situation is still challenging. Passenger transport does not reflect the world-class aspiration of the NDP 2030. The fragmented nature of institutional governance over passenger transport is also not helpful. Despite introducing IRPTNs and other plans and policy supporting the integration modes, the roll-out of improved and integrated passenger transport has been very slow. The following key issues and challenges have been defined in relation to the passenger transport sector:

- A lack of integration between passenger transport modes, despite the positive intentions behind the roll-out of integrated rapid public transport networks (IRPTN).
- Continued passenger transport infrastructure and rolling stock reliability and resilience issues due to under-investment.
- Implementation of appropriate passenger transport modes associated with expected demand – ad hoc attempts to implement expensive BRT systems without considering their appropriateness among other modes/technology choices given passenger numbers, business case support and other developmental and transformation objectives. BRT systems have been implemented due to the availability of infrastructure and local authority funding, without overall master planning, forward planning, guidance and consideration of the future financial and operational costs. The BRT roll out, its choice as preferred mode within the context of other available public transport modes and financing and funding model is considered unsustainable in the long run.
- Competition between passenger transport modes, resulting in friction between operators (e.g., bus/BRT/taxi), which, in turn, hinders cooperation. Due to a lack of a clear hierarchical passenger transport system, lesser modes do not support higher-order modes such as rail, resulting in poor modal integration and no internal (feeder) services in suburban areas.
- On-corridor competition between passenger transport modes.
- Continued difficulties experienced with the proposed taxi recapitalisation implementation and the change in policy direction to include the taxi industry into BRT systems have resulted in uncertainty in the industry, taxi conflict and the non-performance of systems.
- The inefficient management and division of government subsidies for passenger transport where many bus services are still being operated on month-to-month contracts.
- Uni-directional public transport is inefficient and costly. Passenger volumes of 20 000 passenger/trips in peak time on rail, for example, are not cost-effective and do not provide for efficient infrastructure utilisation, given current peak-to-base ratios. Operations rely heavily on subsidies. Without an operational subsidy policy, the provision of public transport services will continue to be inequitable, inefficient, ineffective and uneconomical.
- The lack of land use and transport integration impacts negatively on the effective implementation of mass moving passenger transport. This is evident in perpetuated urban sprawl and land use practices that perpetuate marginalisation, coupled to increased passenger transport cost.
- Urban sprawl and non-adherence to the urban edge result in long travel time and the inefficient use of passenger transport. Coordination between residential development and transport planning must be emphasised and implemented.

- The disjointed and inadequate provision of learner transport. Learner transport provision is the responsibility of the Department of Education on both national and provincial level, especially for learners who live more than 5 km from the nearest school. In urban areas, learners tend to make use of the available public transport subsidised as a concurrent function of all levels of government or through private initiatives.
- The Departments of Education and Transport and local authorities as well as the lack of clarity on roles and responsibilities between these departments and there functions within provinces, are highlighted, as some of the challenges faced in the provision of scholar/learner transport (Draft Learner Transport Policy, 2015).
- The perpetuated apartheid-style placement of new low-cost housing developments on the peripheries of cities or towns adds to urban sprawl, which results in long travel time and the inefficient use of passenger transport.
- Very low densities in rural areas render the provision of scheduled passenger transport unaffordable.
- A lack of safety and operational compliance standards for the general passenger transport.
- The contrast in quality, safety and convenience between BRT facilities and the facilities of traditional passenger transport modes.
- A lack of maintenance on current passenger transport facilities due to underinvestment results in poor passenger facilities, which, in turn, distract from a pleasant customer experience.
- A lack of integrated ticketing, information systems, etc. cause the non-integration of modes.
- A lack of universally accessible passenger transport facilities and vehicles – on both road and rail. Whilst this lack is an issue embedded through the rights given to civil
society in the Constitution, a major challenge is the costly conversion of the facilities, vehicles and systems.

- A lack of reliable and regularly updated public transport data results in uninformed and ineffective passenger transport planning.
- Existing transport legislation does not fully provide for new technology operating services in public transport including e-hailing services.
8.6 Proposed Interventions

With rising car ownership and use, pressure is mounting on the road network. The problem is exacerbated by the poor quality of passenger transport services and limited travel demand management measures. The result is an increase in congestion, unacceptable levels of air pollution, and the wasteful use of valuable urban land and non-renewable resources. What is urgently required is strategic and continued improvement in the performance of passenger transport across all modes.

The NATMAP 2050 has developed a hierarchy of passenger transport corridors to promote modal integration and sustainable improvements. Each corridor comprises a combination of network links and nodes that are based on the purpose and characteristics of passenger movements. The strategic network categorises corridors by movement, including international, interregional or interprovincial, intercity, and urban or rural.

The strategic passenger transport network is linked to the demographic and land use patterns along corridors of national importance. It identifies modal interchanges situated in the metropolitan, urban and rural areas. The proposed strategies also incorporate important economic evaluation and long-term project appraisal criteria and standards relating to increased safety, reliability, efficiency, the full integration of transport operations and infrastructure facilities, the promotion of better land development, and the long-term sustainability of transport systems.

The institutional reform discussed in detail later in the report is of the utmost importance in ensuring the effective provision of passenger transport. In this regard, all necessary legislation is in place to enable, empower and strengthen the proposed structure. The implementation of these institutions must be supported and allowed to take its course to have a material impact.

The main objective of the strategic approach is to move from network to broader corridor integrated transport and to plan land use. The integrated rapid passenger transport network (IRPTN) approach is recommended, as it adopts a full corridor perspective in dealing with passenger transport disintegration. A strategic passenger transport network (SPTN) has been identified to prioritise infrastructure investment and service integration across all modes.

Any commuter corridor with one-directional peak passenger volumes in excess of 20 000, and a travel distance of between 25 and 30 kilometres will be served by metro rail technology. Minimum critical watershed passenger volumes of 16 000 passengers per hour, and trip distances of between 50 and 100 kilometres are recommended for higher-speed rail passenger technology. Buses cannot be sustainably used beyond these passenger volumes and distances.

The strategy also incorporates important economic evaluation and long-term project appraisal criteria and standards. The standards focus on increased safety, reliability, efficiency, the full integration of transport operations and infrastructure facilities, the promotion of better land development, and the long-term sustainability of transport systems.

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Proposed interventions for passenger transport

- In dealing with the issue of the role of the different spheres of government in passenger transport and the fragmented and uncoordinated delivery of passenger transport, it is proposed that devolution responsibilities be assigned to authorities as foreseen in the Constitution and prescribed by the NLTA.
- It is recommended that the DoT and Department of Basic Education develop a collaborative and integrated task team geared to investigate the scholar transport issue and decide on the most appropriate socio-economic solution.
- The implementation of densification plans in Brownfield developments must be encouraged to protect greenbelt areas and prevent further urban sprawl.
- The development of an overarching public transport subsidy policy that incorporates all modes of public transport to subsidise users and not the operators.
- Appropriate modal technology choice guidance must be developed to ensure that alternatives are appropriately assessed and that demand-driven and responsive services are implemented. (Refer also to Table 8-2 and Table 8-3, which provide detailed technology choice/option recommendations and indicate the appropriate mode of passenger transport and integration: taxi vs BRT vs buses vs trains.)
- An in-depth investigation (review, evaluation and economic feasibility study) of the existing BRT delivery model is required to either improve the sustainability of its delivery or to intervene in the future role of BRT systems in South Africa. The investigation should be led by the DoT.
- Public transport planning guidelines must be developed, including the alignment of spatial and geographical development, population densities and land use patterns,
with appropriate modal and infrastructure responses based on technology choice analysis. Developmental approaches, particularly in rural areas, where sufficient passenger numbers do not exist to satisfy the classic demand drive model of predict and provide, must be applied.

- Long-term financial viability and funding mechanisms for the ongoing and ever-increasing operational costs of services must be established.
- The development of an overarching subsidy policy for the effective distribution of the limited operational subsidy to the benefit of commuters and not that of operators.
- The provision of NMT is underlined by its associated policy, addressed by the national rural strategy as well as the IRPTN requirements for NMT facilities around BRT facilities. However, a comprehensive NMT strategy and guideline document is required for the overall urban and rural transport system.
- The development of universal access guidelines based on international best practice to implement universal access in terms of all classes of passengers, people with disabilities, aged, young children, language, with the roll-out of future passenger transport and retro-fitting current vehicles and facilities. The guidelines need to define a suitable roll-out period with regard to the funding implications for, and cost to, the industry.
- Amend existing transport legislation, definitions and provisions to include and provide for new technology operating services in public transport including e-hailing services.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>PASSENGERS/DAY</th>
<th>ADVANTAGE</th>
<th>DISADVANTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-speed rail</td>
<td>5000–10000</td>
<td>Greener than air travel</td>
<td>Needs a large travel market Very high capital cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>City centre access</td>
<td></td>
</tr>
<tr>
<td>New locomotives &amp; coaches</td>
<td>2000–5000</td>
<td>Reliable and of high quality</td>
<td>Very expensive. 3–5 years to procure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Could run at higher speed</td>
<td></td>
</tr>
<tr>
<td>Refurbished stock</td>
<td>500–2000</td>
<td>Lower cost and better quality for customers</td>
<td>Retains reliability issues. May not be capable of higher speed</td>
</tr>
<tr>
<td>Electric multiple unit</td>
<td>1000–4000</td>
<td>Could run shorter trains</td>
<td>Unless dual voltage, operationally limited</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Could be faster</td>
<td></td>
</tr>
<tr>
<td>Diesel multiple unit</td>
<td>500–2000</td>
<td>Can run faster and shorter trains</td>
<td>More expensive to run. Needs specialised maintenance facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can run on any route</td>
<td></td>
</tr>
<tr>
<td>Light rail/tram train</td>
<td>200–1000</td>
<td>Runs on heavy and light rail track. Low capex and opex costs</td>
<td>Cannot run long distance. Limited passenger facilities</td>
</tr>
<tr>
<td>Long-distance bus</td>
<td>100–500</td>
<td>Cheap to run. No fixed infrastructure. Flexible routes and faster than rail</td>
<td>Cannot handle high volumes. Less comfortable for long journeys</td>
</tr>
</tbody>
</table>

TABLE 8-2: PUBLIC TRANSPORT RURAL TECHNOLOGY CHOICE OPTIONS (Source: PRASA, 2013)
<table>
<thead>
<tr>
<th>COMMUTER/INTERURBAN TRAVEL</th>
<th>IMPLEMENTATION TIMEFRAME</th>
<th>PEAK CAPACITY/HOUR</th>
<th>MAXIMUM GRADIENT</th>
<th>SYSTEM LIFE (YEARS)</th>
<th>UNIT CARRYING CAPACITY</th>
<th>INFRASTRUCTURE COST PER KM R MILLION</th>
<th>PER PASSENGER OPERATING COST R/KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>minibus taxi (paratransit)</td>
<td>short</td>
<td>1300–2500</td>
<td>13%</td>
<td>7</td>
<td>10–16</td>
<td>0.8–4</td>
<td>1.06</td>
</tr>
<tr>
<td>regular buses</td>
<td>short</td>
<td>2500–6000</td>
<td>13%</td>
<td>8–14</td>
<td>40–120</td>
<td>0.8–4</td>
<td>1.06</td>
</tr>
<tr>
<td>bus rapid transit (BRT)</td>
<td>short/medium</td>
<td>4000–10000</td>
<td>13%</td>
<td>8–14</td>
<td>40–120</td>
<td>35–60</td>
<td>1.06</td>
</tr>
<tr>
<td>guided bus</td>
<td>short/medium</td>
<td>4000–10000</td>
<td>13%</td>
<td>8–14</td>
<td>300–450</td>
<td>35–200</td>
<td>1.06</td>
</tr>
<tr>
<td>street tram</td>
<td>medium/long</td>
<td>12000–20000</td>
<td>10%</td>
<td>25–50</td>
<td>400–600</td>
<td>67–330</td>
<td>1.88</td>
</tr>
<tr>
<td>light rapid transit (LRT)</td>
<td>medium/long</td>
<td>12000–20000</td>
<td>10%</td>
<td>25–50</td>
<td>400–600</td>
<td>67–330</td>
<td>1.88</td>
</tr>
<tr>
<td>COMMUTER/INTERURBAN TRAVEL</td>
<td>IMPLEMENTATION TIMEFRAME</td>
<td>PEAK CAPACITY/HOUR</td>
<td>MAXIMUM GRADIENT</td>
<td>SYSTEM LIFE (YEARS)</td>
<td>UNIT CARRYING CAPACITY</td>
<td>INFRASTRUCTURE COST PER KM R MILLION</td>
<td>PER PASSENGER OPERATING COST R/KM</td>
</tr>
<tr>
<td>---------------------------</td>
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</tr>
<tr>
<td>tram train</td>
<td>medium/long</td>
<td>6000–12000</td>
<td>3%–10%</td>
<td>25–50</td>
<td>400–600</td>
<td>67–330</td>
<td>1.88</td>
</tr>
<tr>
<td>heavy rail</td>
<td>long</td>
<td>20000–60000</td>
<td>3%</td>
<td>25–50</td>
<td>2000–3500</td>
<td>50–500</td>
<td>0.5–3.0</td>
</tr>
</tbody>
</table>